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<td>17D</td>
<td>2nd</td>
<td>5.1.3.5</td>
<td>Paragraph 5.1.3.5 of API Specification 17D 2nd Edition specifies a stress range between 67% and 73% of the bolt's material yield stress that cannot be achieved or verified using production assembly methods. The stress range is in conflict with the statements included in Annex G paragraph G.1.3 related to the factors affecting the relationship between nut torque and bolt tension. In addition, the current wording does not reflect all flanges covered in 17D (i.e., 17SV flanges were omitted). Is it the intention that the 2nd edition requirements for stress rate be exactly between 67% and 73% of the bolt's material yield stress?</td>
<td>No. Closure bolting of all 68X, 17SS, and 17SV flanges used within the scope of API 17D shall be made up using methods designed to achieve a nominal preload of 67% of the bolt's minimum specified material yield strength (SY). This stress is intended to result in a preload in excess of the separation force at test pressure while avoiding excessive stress beyond 83% of the bolt material's yield strength. Minimum make-up stresses for closure bolting used in Other End Connections shall be as determined by the design. Maximum make-up stresses and design stresses for closure bolting used in Other End Connections shall not exceed 83% of the bolt material's yield strength.</td>
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<td>17D</td>
<td>2nd</td>
<td>5.1.7 &amp; Table 3</td>
<td>Is it the intention that the 2nd edition requirements apply only to new product designs and that products previously qualified to the 1st edition are acceptable for continued usage as 2nd edition product?</td>
<td>No. The requirements for testing (including validation testing) apply to all products manufactured after the effective date (identified on the document cover) with the claim of conformance to the applicable product specification. If product designs were developed using a previous edition of the specification, then those designs must be validated against any new requirements if the resulting manufactured products are marked/identified as conforming to the updated product specification document. The purpose of the “Effective Date” identified on the cover of a product specification document is to provide adequate time to make the transition from one edition to the next; satisfying all requirements of the document including performing any additional testing for on-going and uninterrupted product conformance. Per API procedures, a work group may request an extension of the Effective Date if the standard six-month implementation period is deemed insufficient to permit full conformance to the specification requirements. The governing subcommittee has requested such an extension and it was granted. Therefore the effective date for valve and actuator design validation is February 1, 2013. This applies only to valve and actuator designs. All other requirements must be applied now in order to claim conformance to the document.</td>
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<tr>
<td>17D</td>
<td>2nd</td>
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<td>Should the casing hanger and annulus seal be tested as a Group 3 or Group 4 Mandrel hanger, per Annex F, Clause F.2.23 or F.2.24 or API 6A 20th Edition?</td>
<td>The decision of applicable casing hanger group number is made by the end user. Without specific user input, it was the intent of the 17D task group that subsea casing hangers are considered as Group 3 mandrel hangers. It is important that the user understands that API Specification 6A is written primarily with surface wellhead equipment in mind. Any reference made to that specification by 17D, or any other 17 Specification or Recommended Practice, is made with regard to applicable PSL requirements or to specific process controls.</td>
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<td>17D 2nd</td>
<td>8.7.2.4</td>
<td>If the seal lockdown allows movement of the hanger, as allowed in Clause 8.7.2.4, API 17D, 2nd Edition, shall the test fixture allow the same hanger movement during validation testing?</td>
<td>The varying pressure/temperature cycles of the API 6A Annex F qualification testing should reflect the appropriate installed configuration of the hanger/seal/wellhead combination.</td>
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<td>17D 2nd</td>
<td>5.1.7 &amp; Table 3</td>
<td>In API 17D, 2nd Edition, Lockdown Bushings are not listed in Clause 5.1.7, Table 3. Need SC17 clarification on validation test required, if any.</td>
<td>Validation testing is required, per 8.8.3.1 and further on to Table 3 of 5.1.7. Table 3 defines the seal validation testing per the specific scenario (i.e., seal type and exposure to well bore in production). The rated load capacity is to be validated with testing; however, there is no prescribed number of load cycles.</td>
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<td>17D 2nd</td>
<td>5.1.7.4 &amp; 5.1.7.6</td>
<td>Background: In API 17D, Table 3 the minimum validation test requirements for “Non-metallic seal not exposed to well bore in production” are stated as 3 Pressure-Cycling Tests per section 5.1.7.4 plus 3 Temperature Cycling Tests per section 5.1.7.6. Question 1: Does API require 3 Pressure/load cycling test plus 3 temperature cycling test? Question 2: Can the Pressure test cycles that are conducted during the Temperature cycling test satisfy both pressure and temperature cycling requirements?</td>
<td>Response 1: Yes. Response 2: API Specification 17D, 2nd Edition is currently silent on the issue of whether pressure and temperature cycle tests are to be performed as individual tests or if they may be performed simultaneously. A task group has been formed to develop clarification to this issue. Until such time that definitive guidance is provided from the subcommittee, the manufacturer is responsible for determining the methodology that best satisfies the product specification and/or customer specified requirements with respect to their manufacturing process(es).</td>
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Background: API 17D 8.1.2: All pressure-containing and pressure-controlling parts included as part of the subsea wellhead equipment shall be designed to meet all of the requirements of ISO 15156 (all parts). These parts include - wellhead housing; - casing hanger bodies; - annulus seal assemblies. The question stems from the use of the phrase “meet all of the requirements” and the fact that 15156 has various levels of requirements for parts depending on the manufacturing method and exposure to H2S and CO2 in service. The industry is using more high strength casing such as Q125 in wells which do not have exposure to H2S (zone 0, < .05 psi partial pressure per Figure 1 in ISO 15156-2). The casing connection between the casing hanger and casing contains a mismatch in material grades which can be large when attempting to use casing hanger materials which are below 22HRC. This would typically yield an 85ksi to 125ksi mismatch across the connection. Proprietary Thread manufacturers have become increasingly sensitive to rating properties for connections with such a large mismatch in material properties. To address this issue operators and wellhead manufacturers have started using high strength alloy steels (35HRC or 321HBW) on casing hangers for non-H2S applications to reduce the mismatch in material properties.

Question: Is it acceptable to monogram an alloy steel casing hanger with hardness limit of 321HBW (base material) connected to Q125 casing for a Non-H2S application as defined by operator (zone 0, < .05 psi partial pressure), with specific reference to clause 8.1.2?

NOTE: API product task groups do not address questions on monogramming. Such questions should be sent to API monogram staff. However, the product task group will answer the question as to whether use of an alloy steel casing hanger with hardness limit of 321HBW (base material) connected to Q125 casing for a Non-H2S application would meet the requirements of Spec 17D.

Yes. API 17D section 8.1.2 states that the requirement for casing hangers meet ISO 15156 (all parts), but because the surface and intermediate casing strings are excluded (refer to NACE MR0175/ISO 15156-3:2015, Table 1), the casing hangers which become integral to these casing strings are thereby also excluded. Therefore, use of an alloy steel casing hanger with or without NACE hardness limits may be connected to Q125 casing for these specific excluded applications is allowed and the requirement of 17D, section 8.1.2 still applies to all casing hangers.

Background: Designing offshore units that feature pad eyes that are designed in accordance with API 17D Annex K. These units feature structural steel beams. Question: Which structural steel design code is recommended to use for designing structural beams for offshore units that feature pad eyes that are designed in accordance with API 17D Annex K?

API does not provide recommendations on the use of a document outside of what is specifically identified therein.
API 17D is intentionally silent on the recommendation of design codes for structures or specific structural shapes. However, welding practices are covered in clause 5.3.2. The manufacturer is responsible for taking into account expected loads and stresses imposed by the application, and make available design documentation to the end user for review.
Questions:
1) Are the temperature cycling tests of API 17D Table 3 intended to be the same test regimen referred to in API 6A F 1.11 as “Pressure and Temperature Cycles” and “Pressure/Temperature Cycles”?
2) For validation testing is it required to follow the pressure and temperature test cycles in API 6A F 1.11.1?
3) For a subsea wellhead annulus seal assembly would API 17D Table 3 note a) be referring to the pressure/temperature test cycles of API 6A Figure F.5?
4) For a group 4 hanger/annulus seal assembly, would a pressure/temperature test regimen other than the test cycles in API 6A Figure F.5 satisfy the requirements of “objective evidence” in API 17D 5.1.7.6 for validation?
5) Does the statement in 5.1.7.1 “The manufacturer shall define additional validation tests that are applicable…,” allow modification to the test cycles order or intermingling additional tests within the API 6A F 1.11.1 and API 6A Figure F.1 and F.3-F.8 test cycles.

Responses
1) Yes; see note “a” in Table 3 (Minimum Validation Test Requirements).
2) No. Table 3 does not require API 6A/ISO 10423 F.1.11.1 be followed for pressure testing.
3) No. Note “a” in table 3 is interpreted to be specific to temperature validation testing only. The document is currently silent on the issue of whether pressure and temperature cycle tests are to be performed as individual tests or if they may be performed simultaneously.

NOTE This will be addressed in the next edition. Currently, the manufacturer is responsible for determining the methodology that best satisfies the product specification and/or customer specified requirements with respect to their manufacturing process(es).
4) NOTE Group 4 hanger/annulus seal assemblies” are not defined in API 17D and thus outside its scope. Furthermore, this question would be deemed consulting and the task group cannot render an opinion. However, the following from 17D (from API 17D, Addendum 1) would apply:

“5.1.7.1 Introduction: The minimum validation test procedures that shall be used to qualify product designs in accordance with Table 3 are defined as follows. The manufacturer shall define additional validation tests that are applicable and demonstrate that this validation testing can be correlated with the intended service life and/or operating conditions in accordance with the purchaser requirements.”

5) Yes. Note the additional requirements of this section: The manufacturer shall define additional validation tests that are applicable and demonstrate that this validation testing can be correlated with the intended service life and/or operating conditions in accordance with the purchaser requirements.

API 17D Annex L Paragraph 4 states that a “single hydrostatic test (see 5.4) should be performed for acceptance after all hyperbaric function cycles have been completed. Is the test pressure for the above mentioned test 1.0 X working pressure? Section 5.4 does not include a working pressure hydrostatic pressure test only a 1.5 X working pressure test. Propose the addition of the test pressure into this statement for clarity.

No.
The test pressure for hydrostatic tests as stated in 17D, Section 5.4 is 1.5 x RWP (see 17D, Section 5.4.5.1, paragraph two).

According to this section, there is a distinction made between test media (water and gas). All hydrostatic tests are conducted at 1.5 x RWP. Gas tests are conducted at 1.0 x RWP.
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| 5.5.2   | 5.5.2| I think in section 5.5.2 there is a mistake. It is related to static and dynamic load. We all know that dynamic load most of the cases is higher than the static, however in the section 5.5.2 it just states in opposite way. Let's say I have four padeyes each of which has a SWL of 2 tons, and the padeyes are designed for DAF of 2.0. Thus for static we marked as "8 tons total STATIC four point lift..." And for dynamic we should mark "16 tons total SWL dynamic...". But in section 5.5.2 it says reduced the dynamic load, which is not right. When a crane operator lift the structure and in static condition if the load cell says below or equal 8 tons, he can go ahead. And while downing it through water any dynamic load comes and the load cell shows its equal or less than 16 tons then still he can go ahead, or if it is more than 18 tons, he should stop operation Should the example 2 wording should be changed "instead reduced weight, it should say increased weight?

| 17D     | 2nd  | No. Dynamic SWL should be ½ of the static SWL; for example, 4 padeyes (2 tons each) = 8 tons static, and = 4 tons dynamic. One should not get DAF confused in this; which is why some over-spec all of the safety factors. The idea of a derating of 2 for dynamic loads came originally from API RP 2A WCD The design SF for a multiple padeye lift is 2, for a single padeye lift, it is 5.

| Annex K | 2nd  | In Annex K of the API 17D the Design and Testing of Pad eye is covered. The dimensions and requirements of welded and machined Pad eye are provided in this Annex. Question: Is the forged Eye bolt allowed for lifting provided the calculation and testing per Annex K are followed. No. What you have described is discussed in Annex K of API 17A.
Question 1: Do running tools for mudline hangers require validation testing?

Question 2: Do tieback tools for mudline hangers require validation testing?

Question 3: Table 3 included poppets, sliding sleeves and check valves as one of the components that require validation testing. Abandonment caps are equipped with a means of relieving pressure prior to removal from mudline hangers. Do check valves in abandonment caps require validation testing?

Response 1 and 2: Yes they need validation testing. But since there is no specific requirement in Table 3, it is up to the manufacturer to determine what is appropriate for validation. The test procedure should cover all of the performance claims in the data sheet or performance specification such as lifting load capacity, RWP, stroke length or number of turns, torque or force needed to operate, torque or force output, bending capacity, etc. Basically, if a claim is made, the manufacturer is obligated to be able to back it up in a validation test report.

Response 3: Yes, testing is required per Table 3. It is optional to do the cycle testing of the poppet assembly by itself (not necessarily within the abandonment cap per se) if it helps simplify the test setup and/or procedure. But then the manufacturer needs to follow that up with a form/fit/function test that shows the poppet in the test cap assembly works, again per the performance claims of the manufacturer.

The lockdown bushings we have are mainly for lockdown purposes, although there is sealing capability with the tubing spool, and is not designed to isolate the uppermost seal on the casing hanger. Is it still 17Ds stance that the lockdown bushings get hydrostatic factory acceptance test regardless of design requirements for the lockdown bushing? If we removed the sealing capability would the answer be the same? I would think the answer is no, but there is a shall statement I’m having a hard time getting around.

Section 8.8.1 General
A casing hanger lockdown bushing may be installed on top of the uppermost casing hanger in the subsea wellhead housing to provide one or more of the following functions:

8.8.3.2 Factory acceptance testing
Factory acceptance testing of lockdown bushing shall include internal and external pressure hydrostatic tests.

17D requires internal & external pressure hydrostatic tests. However, lockdown bushings are not in the scope of the document. That means that an agreement between the purchaser and supplier specific to the project is certainly allowed. The following is applicable:

8.8.1 General
The requirement for using a lockdown bushing is dependent on the design of the casing hanger and annulus seal assembly, the project specific loading conditions and the interface to the subsea tree, tubing hanger or tubing head. When the wellhead and tree systems are provided by different manufacturers, the user is responsible for interfacing with the subsea wellhead and tree system manufacturers to determine whether a lockdown bushing is required.

Section 8.1.1 is a list of “one or more of the following”, so the FAT can exclude hydrostatic testing based on the preceding rationale.
| 17D  | 2nd | Annex K | Is using a single padeye designed per Annex K, API 17D as the main running/retrieval and lifting point for an equipment installed permanently subsea with a weight around 20 tonne? The equipment is retrieved every 5 years. If it is acceptable Could you please advise if visual inspection by diver/ROV be acceptable before retrieving the tool? | API 17D, in general, (or specifically Annex K) does not specify a minimum allowable number of padeyes by equipment weight or design configuration; all of that is a function of the lifting sling and framework design, which is beyond the scope of 17D. All Annex K is addresses is the recommended standardization of padeye design calculations, given a particular frame and lifting sling/appliance configuration and design. Therefore, your question is beyond the scope of Annex K, and cannot be answered. API 17D in general, (or specifically Annex K) does not address diver inspection after installed equipment is place into service. Therefore, your question is beyond the scope of Annex K, and cannot be answered. |
| 17D  | 2nd | 5.1.3.6 | I am looking for a clarification if I can on the applicability of API codes to subsea Christmas tree frames. Section 5.1.3.1 in API17D points to the use of ISO13628-7, however section 5.1.3.6 of 17D states that an FEA may be used to demonstrate that no deformations are found that would effect functionality. Engineering diligence aside, is it the intention of 17D to state that frame work only needs to be assessed to a deflection limit and not to a stress or strain limit? | The applicable clause in this case is 5.1.3.6 ("Primary Structural Components") rather than 5.1.3.1 ("General"). No, if the user believes that stress or strain limits are more critical than deflection or deformation then sound engineering practice (dictates those loads should be checked also. |
| 17D  | 2nd | Table 3 | Question 1: Although Table 3 does not provided minimum validation test requirements for mudline running tools, as a manufacturer, we had validated the mudline running tool performances such as rated working pressure, pressure cycling test, number of turns and torque needed to operate, except load cycling test. Do running tools for mudline hangers require load cycling test? Question 2: If it is up to the manufacturer to decide whether load cycling test is required, could manufacturer decide not to perform load cycling test? | Response 1: No, the specification does not identify a particular test to be performed. However, 17D, Section 5.1.1.1. requires that product capability be defined by the manufacturer based on analysis and testing (validation testing). So the manufacturer is required to validate the product's performance. Response 2: No. 17D, Section 5.1.7.1 states that the manufacturer must define validation tests (other than those states in Table 3) that are applicable and must demonstrate that this validation testing can be correlated with the intended service life and/or operating conditions in accordance with the purchaser requirements. So validation testing must be performed. |
| 17D | 2nd | 7.20.2.9 | Background: API 17D currently contains requirements for couplers to be self-venting (i.e., do not trap pressure) which correlate to similar API 17F requirements for the hydraulic system but which contradict to API 17F requirements for the subsea control module. The API 17D text in discussion is as follows: API 17D 2nd Edition §7.20.2.9 Control Line Stabs/Couplers As a minimum, control line stabs for the SCSSV, production master valve(s), production wing valve, and annulus master valve shall be designed so as not to trap pressure when the control stabs are separated except where allowed in 9.2.9. The API 17F text for hydraulic distribution systems which correlate to the API 17D text: API 17F 4th Edition §6.4.1.1 Subsea Hydraulic Distribution System Self-venting hydraulic couplings should be used to prevent trapped hydraulic pressure from inhibiting closure of critical XT-valve actuators or other fail-closed safety systems. Consideration shall be given to potential water intrusion into the hydraulic system where self-venting hydraulic couplings are used. The API 17F text for subsea control modules which contradict to the API 17D text: API 17F 4th Edition §6.4.3 Subsea Control Module All hydraulic coupler interfaces shall be made up with couplers that seal upon disconnection, unless this compromises safety considerations stated in this standard. The design shall minimize the ingress of seawater during running and make-up operation. The coupler half that contains the active seal shall be located in the retrievable equipment. Question: Do the control line stab/coupler requirements in §7.20.2.9 apply only to the hydraulic system and not apply to the subsea control module and interfaces (e.g., subsea control module mounting base)? |
| Response: API 17D, Section 7.20.2.9 refers to a hydraulic venting function in a coupling or poppet interface for specific hydraulic lines that lead to fail-close safety function devices. This is intended to ensure that the hydraulic actuator operating the safety device (DHSV, USV, etc.) can freely vent to ambient pressure (and in turn allow the safety function device to close to a safe-state position), in the event of a severe mechanical damage event or unplanned quick disconnect. Not all hydraulic couplings used at these interfaces must be a vented type; only the hydraulic lines associated with operating safety functions. API 17D, Section 7.20.2.9 identifies the venting coupling requirement for direct hydraulic and piloted hydraulic control system configurations (which feature hydraulic control lines routed on the subsea tree) for safety function lines. It makes reference to API 17F for “other” control system configurations (such as electro-hydraulic), but cites that these “other” control system configurations need to provide an inherent feature (or functionality) that meets the venting requirement of API 17D (if venting couplings are not used). This requirement for other control systems assumes the subsea control module (SCM or control pod) and its mounting interfaces are located somewhere on the subsea tree’s structure, and therefore could be susceptible to damage or unplanned disconnect events. Therefore, if the SCM incorporates or provides a conduit that leads to or is a part of a safety function’s control line (circuit), then that specific line is subject to API 17D, Section 7.20.2.9 “venting” requirements. The SCM’s architecture (or hardware features) must demonstrate that it either has venting couplings or some other feature that allows for venting of any or all safety device hydraulic lines if the SCM be structurally separated from its mounting base or an unplanned disconnect take place (allowing hydraulic pressure in these lines to vent pressure and allow safety devices to move [close] to a safe state). |
API 17F is the general standard for control systems but is silent on the venting coupling requirement because use of these couplings are specific and location-centric. If the control system (including SCMs) does not incorporate or control any safety function hydraulic circuitry, or the control system is located elsewhere, away from the subsea tree, then it is not subject to API 17D, Section 7.20.2.9 (or API 17D in general). Then the control system and its hardware are only subject to meeting API 17F. It is only when the control system is located on a 17D tree and/or has an integral part of its safety functions that it becomes subject of both API 17D (Section 7.20) and API 17F requirements.

| 17D | 2nd | 5.1.2.1.7 | I have a doubt regarding 5.1.2.1.7 and table 2 pressure rating for internal thread connections. The specific case is for a test port. The size addressed in Table 2 of ½” for API line pipe, for a RWP 69 Mpa, is this considered a maximum size per 5.1.2.1.7 which states “shall conform to the limitations”, or can other sizes be also allowed such as an internal thread connection of ¼”?

Based on the current wording of the document, the smallest allowable size for the threaded connection would be ½”. So no, ¼” would not be permitted.