API 15HR Discussions and Actions:

15HR Leads - David Granderson, Paul Bryan, John Biro

1. Review of ballot 2307 results – New Facility test requirements

Voting Results: 14 ballots
9 responses
Response rate = 64%, > 50% required
Approval rate = 89%, > 67% required

Background: An existing API 15HR licensed manufacturer builds a new factory producing the same pipe. Does the manufacturer have to produce another long term regression test per ASTM D2992 or is the lesser ASTM D2992 section 12. Reconfirmation of HDB or PDB sufficient to validate product performance at the new location?
Proposal: Only the Reconfirmation test is required ASTM D2992 section 12

Consensus – Yes, Existing qualified licensed manufacturers should accomplish a passing Reconfirmation test for a new manufacturing facility location. Add to specification.

Comments:
John Biro, FPI – Single Negative ballot resolved via email with Mr. Biro.

After discussion with my colleagues, it was decided to accept your recommended solution of requiring only a requalification test per ASTM D2992 at a new manufacturing location, and to require test specimens to be pipe only rather than across-the-joint. This change would allow us to withdraw our negative vote on the proposed revision of 15HR. Accordingly, please add the appropriate verbiage to Appendix A and resubmit the final version of the revision for a re-vote.

Noe Hoijman, NHA Consultores – Affirmative with comment
Section 5.4.1 requires for the requalification test that the testing samples be assembled with a prime connection, as it indicates explicitly the employment of the "make up procedure" for assembling the samples. Additionally, several manufacturers have performed qualification tests (testing from 6000 to 10000 hours), employing a prime connection in all the testing samples.

Discussion:
It was agreed these comments were not specifically relative to ballot 2307 (whether or not a Reconfirmation should be required or not). Details of the reconfirmation to be addressed later in the meeting.

Action:
Relevant comments addressed, ballot passed to be incorporated into the revised 15HR.

2. Review of Ballot 2308 results
Proposal: Revisions to multiple sections of 15HR
15HR Sections affected:
  • 2.1
  • 4.2
  • 5.1.1 – (3)
  • 5.3.2
  • 5.3.4 (a)
  • 9.2
  • Add clause 11

Voting Results: 14 ballots
  9 responses
  Response rate = 64%, > 50% required
  Approval rate = 100%, > 67% required

Consensus – Yes, accept proposed changes.
2308 – Section 4.2 Pressure Ratings

**Background:** Revise pressure rating increments for pipe sizes larger than NPS 12.

**Comments:**

Noe Hoijman: “The proposed text revision is not clear regarding the pipes with NPS smaller than NPS 12” Proposed change: “Maintain the old text with this addition: For pipes larger than NPS 10 gauge in 100 lb/in2 increments.”

Chris Makselon, Fiberspar: “What is the intended increment for pipes smaller than NPS 12 inch? If it is still 250psi then the proposed revision does not make that clear.” Proposed change: “in 250psi increments for pipe smaller than NPS 12 and 100psi for pipes larger than NPS 12”

John Biro: Similar comment as to Clarity of the ballot statement.

**Discussion:**

Review of the SC 15 minutes from October 2010: The intended wording should be: “It is recommended that the pipe be purchased by pressure rating. The API Standard pressure ratings are from 500psig to 5000psig. For NPS ≤ 12” nominal diameter the pressure increments shall be in 250 psig increments. For sizes > 12” the pressure increments shall be in 100psig increments. The user should purchase pipe suitable for the specific service conditions.”

**Action:** All agreed comments address ballot passed. To be incorporated into the revised 15HR.

2308 – Section 5.1.1 Pipe and Prime Connection – 3 revisions

**Background:**

1. To clarify that 15HR intent is that 0 failure points are required at 10,000 hrs and to clarify that the minimum length of the 15HR regression test for pipe is 6000 hrs and not 10,000 as per ASTM D2992.
2. Remove equation (1) - ASTM D2992 Pressure equation = API 15HR equation 2 = ISO 14692 pressure equation). API equation 1 is not common and produces similar results; complications arising from pressure equation (1) outweigh any perceived benefits.
3. Revise OD/10 ratio to ≤ 20 - OD/t ≤ 10 does not necessarily produce more conservative HDB’s (design stresses).

**Comments:** None,

**Discussion:** None,

**Action:** All agreed
2308 – Section 5.3.2 Standard Thread Design

**Background:** References in 15HR to API 5B are out of date.
**Comments:** None
**Discussion:** None
**Action:** All agreed

2308 – Section 5.3.4a Gauging Practice for Standard Threads

**Background:** Clarify the intent of “own or have access to” API Master Gauges.
**Comments:** None
**Discussion:** None
**Action:** All agreed

2308 – Section 9.2 Marking Requirements

**Background:** Add a requirement for standard 15HR temperature rating at 150°F and that additional information as required by purchaser can be added i.e. rating at a higher temperature.
**Comments:** None
**Discussion:** None
**Action:** All agreed

2308 – Add new Clause 11 – Field Hydrotest Pressure

**Background:** API 15HR lacks field pressure testing guidance. The purpose is to offer end users guidance clearly within the standard to protect products from unintended damage. Other specifications offer guidance in field testing (i.e. ASME B31.3, 31.4, ISO 14692).

**Comments:**

**Pu Gu – PPG:** The only parameter included in the proposed new clause 11 - field pressure testing is the field pressure which is specified as 1.25 of max system design pressure. Suggest field pressure testing be further defined with more specific parameters as test medium, hold time, etc.

**Discussion:**
API 15TL4 section 7 gives guidance on test medium and duration of field hydro test. The revision to 15HR is intended to set the upper limit for the product and not to stipulate field hydro test procedures. Field procedures are not within the scope of a product standard.

1.25 is the upper limit of the field hydro test however field conditions such as bending that will add to the axial stress component must be considered.

**Action:** All agreed, comments addressed.
3. Review of Ballot 2309 results
Proposal: Revisions to multiple sections of 15HR
15HR Sections affected:
- 5.4 Requalification (reconfirmation)
- Appendix A: Remove A5, A6, A7, A8
- Appendix A: A9
  - Add new item to A9 Facility Location (excludes expansion at a current facility)
  - Cure temperature/ time
  - Wind angle
  - Stack sequence
  - % reinforcement
  - Tg
  - Thread dimensions
  - Liner thickness

Voting Results: 14 ballots
9 responses
Response rate = 64%, > 50% required
Approval rate = 89%, > 67% required

2309 Section 5.4 Requalification

Background: API15HR 5.4 and ASTM D2992 12 have different terminology for the same process. Proposal is to align terminology, 15HR to mirror ASTM D2992 language “Reconfirmation of HDB or PDB”.

Comments: None
Discussion: None
Action: All agreed

2309 Appendix A - Product Characteristics

Background: Remove A5, A6, A7 and A8 as they are not relevant to product reconfirmation requirements.

Comment:
John Alkire, Guest: Comment: I do not agree with eliminating the A.5 to A.8 deletions since things like adhesives and thread molding compounds, especially, can affect joint performance.
Propose: Leave it as is in current proposal.
**Discussion:**
The pipe regression test 15HR 5.1.1 is intended to determine pipe wall stress and should be independent of A.5 through A.8. Serious errors can arise if regression testing is allowed to mix failure types, some joints, some pipe wall, etc. can produce results which are inaccurate for both. Representative regression testing should contain similar failure types to be meaningful.

Accurate prediction of pipe wall performance requires pipe wall failures, component performance requires component failures in regression testing. A meaningful reconfirmation test for any changes to pipe, joint or other components should be compared against representative long term qualification testing.

Details for reconfirmation are being considered, any changes to components will be reconfirmed.

**Action:** All agreed, comments addressed.

**2309 Appendix A – A9 Manufacturing**

**Comments:**

**Noe Hoijman:**
The text of the NOTE introduces subjective evaluation criteria as "substantially higher", substantially shorter", "may require"

Propose: Do not use the proposed text of the NOTE. Replace by this text: "Changes in the curing time higher than +/- 5 minutes in any curing stage, and/or changes in curing temperature higher than +/- 10°F (5°C) in any curing stage, require reconfirmation".

**John Biro: Negative**
Based on our experience, change of manufacturing location can indeed effect product performance, even if all manufacturing parameters are kept identical. As example, manufacturing a specific product in a Middle Eastern country required significant changes in raw material and processing specifications from those manufactured in Europe, due to higher temperatures and humidity. High temperature and humidity was found to rapidly degrade the sizing on the glass fibers thus effecting the final product's performance. High temperature and humidity was also found to alter the viscosity of the resin, winding tension and impregnation levels thus effecting the final product's performance. Accordingly, we recommend keeping the current requirement of a full 6,000 hour regression test per Section 5.1.1.

**Discussion:**
Cure schedule: Note that one pipe and a single wall thickness (mass) was tested in long term regression. i.e. 2” pipe with OD/t = 10

Manufacturers are qualified to make all OD/t ratios 8 to 40 and all diameters 1.5” to 16”, all of which will have different wall thicknesses and mass (requiring adjustments to the curing
cycle, time and temperatures) No one can or has repeated reconfirmation regression testing on all diameters and wall thicknesses for minor adjustments in cure schedules.

Factory location: Currently, neither ASTM D2992 nor API 15HR require a “reconfirmation test” based on location. Material and process changes do require a reconfirmation of HDB or PDB. There is no requirement for a full regression test in either ASTM D2992 nor current 15HR. The October 2010 SC15 vote was to ADD “plant location” as a necessary reason to perform a reconfirmation test. It was not a vote to remove full regression testing for new locations, but rather to state that “reconfirmation should be required” as “reconfirmation” is also not strictly required as stated in D2992 or 15HR. The effects of climate etc mentioned by Biro will be found in Reconfirmation testing. Where positive reconfirmation cannot be achieved the only option available is then to complete a full regression test.

Intention is to separate pipe wall performance from joint performance to eliminate errors in regression analysis induced by mixing failure types in a single test.

**Action:**
John Biro agreed to withdraw negative, all agreed, comments were addressed, ballot passed. Revisions will be proposed to separate joint (components) and pipe wall performance testing in both qualification and reconfirmation. Methods considered are short term comparison (API R4 – 5.1.4), medium term survival testing (ISO14692) by representative long term regression. Further revisions will be made to consolidate the changes.

Negative comments were addressed and will be refined further, with no negative votes ballot 2309 passes.

4. **Review of ballot 2322 results – 15HR Scope**

**Voting Results:**
- 15 ballots
- 9 responses
- Response rate = 60%, > 50% required
- Approval rate = 88%, > 67% required

**Background:** No current language in the document clearly defines the allowable products that fall within the scope of the document. With reference to other industry standards on FGP (i.e. ISO 14692), the proposed language was developed. Thermoplastic or elastomeric materials may introduce significant changes in performance characteristics of the GRP piping. The proposed addition is to define the scope of the products covered within the scope.

Add new clause 1.1.4 - This specification is applicable to rigid pipe components made from thermosetting resins and reinforced with glass fibers. Typical thermosetting resins are epoxy, polyester, vinyl ester, and phenolic. Thermoplastic resins are excluded from the scope of this specification. Any internal liners applied shall be made also from thermosetting resins. Fiberglass line pipe for use in low pressure systems are covered in API Spec 15LR.

**Comments:**

**Franco Stupenengo:** Positive accepts all changes.
Steve Baker, OCV: Abstain

Chris Makselon – Fiberspar - Negative
I vote negative on this change for several reasons including the following:

Products with a thermoplastic inner liner can perform and successfully meet all the requirements of API 15HR. Regressions testing, fittings tests, and other requirements of the specification have been shown to not be affected by the presence of a thermoplastic liner. Changing of the scope to eliminate thermoplastic lined products would result in commercially available products being written out of the specification and therefore losing their ability to be monogrammed. Products built to the current API 15HR with thermoplastic liners have been available to the industry for more than 20 years. If there is the possibility of known changes in performance due to thermoplastic or elastomeric inner liner materials, then incorporate these into the specification as opposed to just eliminating them from the scope. I suggest making modifications and changes to the specification that incorporate the information about thermoplastic lined products as opposed to just eliminating these products from the scope.

Discussion:
How 15HR is not relevant to glass reinforced thermoplastics.
- Steel joints are not included in 15HR.
- The current bend radius eliminates spoolable products.
- Spoolable products must have a thermoplastic liner to perform.
- There is no way to inspect the fiberglass laminate per 15HR table 2 after the internal and external thermoplastic is installed, thus visual inspection per table 2 is mostly irrelevant as there are no fiberglass joints and the fiberglass pipe is not visible.
- The liner changes the LCL dramatically as measured by ASTM D2992, failure modes differ substantially between fiberglass pipe and spoolables.
- Thermoplastics are more susceptible to degradation by hydrocarbons where thermoset resins are not.
- External collapse of spoolables is a primary qualification concern and is not addressed in 15HR as thick wall fiberglass pipe is not as sensitive to external loads.
- API already distinguishes between low and high pressure fiberglass, where both are rigid glass reinforced thermoset resin pipe. Including thermoplastics in 15HR would produce a less robust specification for both 15S and 15HR products.
- There has been no representation of spoolable thermoplastic pipe in API 15HR since it’s inception prior to this committee being tasked to revise 15HR, so it is not surprising to find much of the 15HR specification to be irrelevant for spoolables and lacking with respect to specific performance issues specifically related to spoolables.

Consensus is that spoolables belong in 15S and work should proceed to make 15S a more relevant product standard for reinforced thermoplastics (spoolable).

Mr. Makselon indicated he may remove his negative vote if he could gain support from the committee in identifying the major concerns between fiberglass pipe and spoolables. The list above and minutes from last October outline some of the concerns.
**Action:** All except Chris Makselon of Fiberspar agreed to the proposed 15HR scope clarification. It was agreed by the majority to move forward with the 15HR scope clarification as balloted and passed.

API to move forward with clarifying the scope of 15HR.
Per API Procedures for Standards development 3rd ed: 7.5.7 e.
Fiberspar comments with the negative ballot were found to be non-persuasive to change the opinion of the committee. The final disposition of these comments shall be communicated to the voter and shall include offering the right to appeal. The non-persuasive objection shall also be recirculated to the consensus body offering them the opportunity to respond, revise or reaffirm their vote.

**Conclusion of ballot results discussions**

5. **David Granderson presentation of mixed failure modes in regression testing.**
A detailed discussion of the problems involved in mixing failure modes in regression testing was presented. Mixing joints with pipe wall regression testing can result in skewed results of long term pipe wall stress and yield results which are not relevant for either pipe or joints.

**Proposed changes Section 5**

**Background:**
The published Specification 15HR Standard Pressure Rating shall be determined by the following method: ASTM Standard Method D 2992 Procedure B with free ends shall be performed at 150°F or higher. Each specimen that fails beyond 6,000 hours shall have a prime connection at the center of each specimen.

**Suggested Changes:**

5.1.1 **Pipe wall design stress (Ss)**
The published Specification 15HR Standard Pressure Rating shall be determined by the following method: ASTM Standard Method D 2992 Procedure B with free ends shall be performed at 150°F or higher. **Intention is to remove: “Each specimen that fails beyond 6,000 hours shall have a prime connection at the center of each specimen”**

The test sample shall be a size no smaller than 2 inch nominal diameter, with an outside diameter to reinforced wall thickness ratio of 20 or less for scaling to be unlimited. If an outside diameter to reinforced wall thickness ratio of greater than 20 is used, the tested ratio shall be the lower limit for scaling. **(REMOVE): The samples shall be assembled by the manufacturer’s documented make-up procedure. Any ASTM D 2992 test started after September 15, 1988, shall have DSC (Differential Scanning Calorimetry) data on each sample in accordance with Appendix C.**

Pipe regression testing completed after October 1, 2011 for the purposes of determining $S_s$ (pipe wall LCL hoop stress) shall not contain joints, as premature failures influenced by joints can lead to errors in the 20 year extrapolated pipe wall design stress. Joint strength
should be tested independently following section 5.1.2. Care should be taken to ensure that the same failure mode is plotted for each regression test completed.

5.1.2 Fittings
Test the highest anticipated pressure class in the four inch size and its pipe and prime connection. Test temperature, 150°F or higher. Pressure test 6 fittings of each type (90° elbow, 45° elbow, tee). At the manufacturer’s option; the 90° may be used to qualify all elbows and couplings. Each fitting shall be joined to pipe using the manufacturer’s documented makeup procedure. Thread dimensions and DSC Tg (per Appendix C) shall be recorded for each fitting. The end caps shall be unrestrained and there shall be at least 12 in. of pipe between the end enclosure and the fitting. The assembly for each average time to failure shall be placed on test at the same pressures. The assemblies shall be on test at pressures such that two failures are obtained in each of the following time ranges:

- Hours to failure (average of set)
- 10 to 100
- 100 to 1000
- greater than 2000

Calculate a pressure regression line per ASTM D2992 and extrapolate it to 20 years. The 20 year value shall equal or exceed the 20 year 95% LCL of the same pressure class pipe.

5.1.2 - Replace Fittings with Components (All components should require qualification not just Fittings = (tees and Ells).

3.1.3 - Component (current definition): Any high pressure line pipe, pipe connection, fitting, flange, adapter, reducer, or end of outlet connections covered by this specification.

3.1.3 – Revise current component definition: remove line pipe and clarify pipe connection by adding “joint”, remaining language is acceptable as is.

Eventually have pipe regression for “hoop stress” and scaling among diameters, and representative component regression with scaling rules. i.e. same materials, manufacture, and failure mode.

Discussion:
- Fittings are complex and difficult to scale by size and pressure.
- Includes Elbows, Tees only?
- More complex shapes may qualify less complex shapes.
- Fittings 20 year (PDB) ≥ Pipe (PDB) to obtain an API pressure rating.
- 6 samples indicate strength and slope of regression curve
- Option 1: Allow current component 6 pt regression
- Option 2: Allow 2 x 1000 hour survival test as option 1 using representative component regression data (from option 1) to determine regression slope.
- TP1000 = (Pr/sf) x 10(log175200-log1000)x
- Details defined: 1000hr minimum time, and b is the (–b) (slope of pipe regression line per ASTM D2992)
- Table of default minimum regression slopes per ISO14692?
- Noe questioned the configuration of the joint test specimen and suggested that the more than 6 samples be used in the fitting regression test. He also asked for details on how the joint would be separated from the pipe test and what area defines the joint; is the
transition from the pipe body to the joint consider part of the joint or part of the pipe body? He also pointed out that ASTM D 2992 allows fittings and pipe to be tested at the same time.

- Some discussion of making flanges a separate category with different qualification test requirements.

6. **Presentation of current ISO 14692 investigation of a stress ageing regression test**
   The current ASTM D 2992 regression test subjects pipe sample to stress levels above the proportional elastic limit (PEL). Members of the ISO 14692 committee are investigating a modified regression test method with stress levels below the PEL. At this point the investigation is not complete and is this is not currently an active API 15HR proposal, presented for informational purposes only.

7. **Alternate connections (AC)**
   Noe raised the question of making an alternate connection as defined in 5.3.3 a standard connection. The consensus was no, because AC’s are typically proprietary design and not in accordance with an existing published standard for threads.

8. **Section 5.2.2 Dimensional Tolerances**

   **Background:** Action item from October 2010 – Granderson. Tolerances on inside diameter, total wall thickness, minimum reinforced wall thickness, and outside diameter are defined in Table 1. It was proposed to add clarification that pipe diameters not listed in table 1 are not excluded from this specification. Until larger diameters are standardized, the minimum inside diameter should be agreed between user and manufacturer.

   **Discussion:**
   None

   **Action:** Vote was taken to add this clarification
   **Favor:** ALL (10)
   **Oppose:** None

   **Ballot proposal (1):**

   5.2.2. below table 1:

   Add: “Table 1 does not intend to exclude or limit nominal diameters not listed in table 1. Until larger diameter dimensions are standardized and published in 15HR, the minimum inside diameter for sizes not listed in table 1 shall be agreed between user and manufacturer.

   Not in need of balloting but relevant to table 1:

   Incorporate addendum from Nov. 2004 to table 1:
Section 5.2.2 Dimensional Tolerances, Table 1

**Background:** The current minimum inside diameter listed for NPS 8 and 10 in Table 1 represents is 12% less than the NPS for these sizes. However the current value listed in table 1 for NPS 8 of 7.625 is only 5% less than the NPS. Recommend revising the minimum ID for NPS 8 to 7.4 inches.

**Discussion:**
None

**Action:** Vote was taken to revise the minimum ID for NPS 8

**Favor:** ALL (10)

**Oppose:** None

**Ballot Proposal (2):**

Modify table 1 minimum 8” inside diameter in table 1 as follows:

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Min inside diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8”</td>
<td>7.40”</td>
</tr>
</tbody>
</table>

9. Sections 5.1.1 & 5.1.2 – Clarify test fluid

**Background:**
Section 1.2.2 clearly states the standard service conditions for Specification 15HR are:
- Service life is 20 years
- Service temperature is 150°F
- The fluid environment is salt water

However sections 5.1.1 and 5.1.2 do not clear define the test fluid to be used. Based on input from Noe it is probable that some manufacturers may be using oil as the test medium. Test data was presented clearly showing that oil will result in higher long term stress values when compared to water. It is proposed that Sections 5.1.1 and 5.1.2 be modified to indicate: Performance pressure testing shall be conducted with water as the internal test.
fluid. The water may be fresh tap water or salt water containing no more than 4.7 oz/gal of table salt = (35 g/L) (average salinity of typical sea water).

**Discussion:**
The question of establishing a de-rating factor for fluid service was raised. However it was determined the complexity of this issue was beyond the scope of the proposed revision.

**Action:** Vote was taken to clarify the test fluid  
_Favor: ALL (10)  
_Oppose: None

**Ballot (3):**
Add clause to 5.1.1 and 5.1.2:

“All performance pressure testing shall be conducted with water as the internal test fluid. The water may be fresh potable water or salt water containing no more than 4.7 oz/gal of table salt = (35 g/L) (average salinity of typical sea water).”

10. Definition of Minimum Wall Thickness

**Background:** Reference: 5.2.2, 5.1.1, 7.4.6, 8.2, ASTM D3567. Confusion arises from the terminology of wall thickness in 15HR and abounds from qualification, manufacturing, QA, property testing, system design and stress analysis. Propose to clarify the wall thickness concern by clear definitions which are not apparent in ASTM D3567 and include measure methods and definitions in 15HR appendix.

**Discussion:**
- David Granderson presented a detailed discussion with visual aids describing how wall thickness measurements are made per ASTM D 3567. Included in the discussion were areas of potential confusion and misinterpretation.
- Minimum “average wall thickness”, as measured in ASTM D3567 shall be used in determining wall thickness (stress) in qualification and QA testing and shall be guaranteed by the manufacturer.
- It was agreed that if the minimum wall thickness measured at any point in a cut cross section were used for acceptance criteria for an individual pipe that the same minimum wall thickness should have been used when calculating wall stress during qualification testing.
- Discussed an example of wall thickness measurement in the appendix, similar to DSC testing.

**Action:** Vote was taken to include guidance on wall thickness in 15HR Appendix  
_Favor: ALL (10)  
_Oppose: None
**Ballot (4):**

All references to “minimum reinforced wall thickness” API 15HR 5.1.1, 5.2.2, 7.4.6, 8.2

Add definition

**3.1.18 Minimum reinforced wall thickness:** The average fiber reinforced wall thickness less any unreinforced resin thicknesses. Determined by ASTM D3567 section 7.3.2 and reported per section 7.5.2 “average reinforced wall thickness”. The average reinforced wall thickness of any pipe cross section measured by 6 observations per ASTM D3567 shall meet or exceed the manufacturers published minimum value. The same definition applies in qualification and verification activities.

**Thursday July 14th 2011**

11. **15LE Discussion:**

Review of ballot to reduce ASTM D 1599 burst test pressure. Comment from Vincenzo Savino were addressed. API to send an E-mail with All Wilkes comment.

Review of API 15S work group proposal from Blain Weller. No comments or open discussion of this issue.

12. **15S Discussion:**

The API 15S work group meet was held in a separate break-out meeting. The API 15S work group will compile the minutes and submit to API separately.

13. **15HR Discussion of Testing/Qualification of Pipe, Joints and Components**

SC 15 split into subgroup A and B. 15HR subgroup A discussion summarized below.

**Discussion:**

Qualification options discussed:

- 5.1.2 already outlines a scenario for qualifying components, a medium term regression test is compared to the primary pipe regression line and where the 20 year life of the component exceeds the pipe Pressure Design Base it is considered qualified.
- Regression tests on one of each category, pipe, joints and components, then complete survival tests to qualify similar components in the family based on the slope of the regression test of the representative component.
- Qualify components in survival testing against pipe regression results
- Offer some representative conservative regression gradients by which to design medium term qualification tests.
• Must define acceptable scaling rules for fittings, joints and pipe which minimize the amount of long term testing. Possibly a factor of (pressure x diameter) for related components.
  o i.e. test a 90 degree elbow would qualify all elbow angles from 0 to 90 degrees.
  o A 7” 8rd joint qualified to 1500psi may qualify an 8 5/8” 8rd joint to 1200psi, etc.
• Flanges would be treated as a separate item with no regression test. Possibly a 2X pressure rating test for 1000 hours at maximum rated temperature. Sample would consist of two flanges and would test highest pressure rating in each thread size.
• Qualification of components should include longer term testing at maximum design temperature to incorporate creep relaxation and any degradation which may be imposed by longer term testing in water. This is the primary reason for moving away from the R4 method unless all manufacturing, design, and materials are identical to the component qualified.

Action:
David Granderson volunteered to draft an outline proposal, work with Hoijman to arrive at a tentative agreeable approach. All present agreed to exploring a more robust qualification concept if acceptable scaling rules could be agreed so the testing requirements did not become too onerous. This to happen before next meeting.

14. Review of Action Items from October 2010 Meeting

15HR Appendix C:

Discussion:
DSC for pipe add “and components” – verbally agreed June 2010

• A request was made to include both $T_{g1}$ and $T_{g2}$. After a detailed discussion of the difference between $t_g$ versus $t_{g2}$ the group agreed $T_{g1}$ should remain as listed.
• A suggestion was made that the Tg of the delivered products should be equal to or higher than Tg of products used for qualification testing.
• It was agreed to revise C.4.1 to eliminate the use filings or grindings - OUT
• Noe request that Appendix C include specific language on how to take a resin sample for DSC testing. Noe agreed to draft language for updating Appendix C and submit to the group for review.

Actions:
• After discussion sampling methods it was agreed that no change was required.
• All agree that “and components” should be added. This was deemed and editorial change that would be handled by API without balloting.
Review of alternate methods to measure glass transition temperature.

Discussion:
• No action taken on this item pending input from Bill Stringfellow.

5.3.4 Clarify intent of Master thread gages (own / access)

History: 5.3.4 Gaging Practice for Threads and Pipe Connections
a. Gaging Practice for Standard Threads (API 5B – 8rd/10rd)
The manufacturer shall own or have access to master and working gages – 5.3.4 is poorly worded and sometimes misinterpreted

Action:
It was agreed that 5.3.4.b should be revised to read: “The manufacturer shall determine and document critical inspection criteria and establish inspection methods to ensure non standard “AC joints” meet minimum requirements, this includes owning or having access to master gages as necessary to calibrate working gauges.

This was deemed and editorial change and will be handled by API without ballot.

15. Discussion of hydrotest

• Noe cited an example of a shop pressure test head which used an O-ring to seal against the ID of the pipe wall. It was agreed this did not meet the intent of the standard as it did not test the connection.
• Running short joints of pipe for burst testing was discussed. It was greed this was allow provided the “short” joint came from the same production lot.
• PetroPlastic asked for clarification that ASTM D 1599 burst testing could be conducted at ambient shop conditions and did not need to be conditioned to 73F as stipulated in ASTM D 1599. Petroplastic and VEM volunteered to draft language for consideration at next meet.
• Extending time to burst was discussed. No resolution.
• Action: Petroplastic and VEM to draft language for the intentions of short term testing with necessary deviations from ASTM D1599 such as testing at ambient temperatures i.e. (0 – 40 C) instead of SLT and modification of the minimum time to failure, i.e. allowing a larger failure window such as 2-3 minutes instead of 60-70 seconds.

End 15HR Discussion

API 15TR Tubing Specification

Discussion:
It was agreed at the October 2010 meeting that the new fiberglass tubing/casing specification: API Spec. 15TR will be in the format of the previously submitted but later abandoned 15TR-draft, but its content will be based on current manufacturers’ existing design methods, dimensions, rating systems and quality assurance systems, or most likely a combination of them. The rationale for this decision was that this would be the fastest way to a badly needed tubing/casing specification as it does not require additional test programs. The validity of this direction can be justified by the 40+ years of successful field performance of these existing, commercially available products. Other, more advanced design methods, such as the one under development by ISO for fiberglass piping could and probably would be added in the future as improvements/updates.

This direction requires sharing current manufacturers’ data base and we have agreed to do this. For this purpose, John Biro will be collecting input from current manufacturers: FGS, Ameron/Centron and FPI. We will then attempt to prepare an initial summary and present it at the next Subcommittee meeting for review and discussion.

Recommended format for manufacturers data:

1. SCOPE
   - threaded connections (T&C, IJ, A/C)
   - diameter sizes included (tubing, casing?)

2. DIMENSIONS
   - tubing/casing diameters (ID, OD, drift) and lengths
   - thread sizes
   - allowable tolerances

3. DESIGN METHODOLOGY
   - design of tubing/casing wall (winding angles, wall thickness, high-to-low angle winding layer ratio, layer sequencing, etc)
   - design of threaded connection (thread type, threaded end reinforcements, etc)
   - ratings methods (internal pressure, collapse, axial tension, etc)

4. QUALITY SYSTEM
   - QC dimensional checks
   - QC performance tests
   - lab tests for material properties,
   - test frequencies
   - required documentation

5. any other items you deem necessary or helpful

**Action:**
John Biro requested that manufactures complete their data in the above format and submit for review.

16. Next meeting tentatively scheduled for Tentatively for November 2011, may be scheduled sooner if action items are addressed sooner.

Meeting adjourned