API SC 15 Meeting Notes October 19th and 20th, 2010

Meeting location: NOV - ETC 10100 Houston Oaks Drive Houston, TX 77064

Meeting attendees Tuesday October 19th 2010:

David Granderson- NOV FGS – SC15 Co chair
Al Wilkes – Performance Pipe – SC15 Co chair
Craig Moore- NOV FGS
Paul Bryan – Centron International
Steve White – Occidental Oil and Gas
Shail Ghaey– API
Blaine Weller – Flexpipe Systems
John Biro – Future Pipe

Meeting attendees Wednesday October 20th 2010:

David Granderson- NOV FGS – SC15 Co chair
Al Wilkes – Performance Pipe – SC15 Co chair
Craig Moore- NOV FGS
Paul Bryan – Centron International
Steve White – Occidental Oil and Gas
Shail Ghaey– API
Blaine Weller – Flexpipe Systems
John Biro – Future Pipe
Andy Ethridge – Flex Steel

Pu Gu- PPG Industries
Steven Baker- Owens Corning
Noe Hoijman- NHA Consultores
Oscar Zapata – DUOLine Technologies
Tom Walsh – Walsh Consulting Services
Tim Dyer – Performance Pipe
Chris Makselon – Fiberspar

API 15HR Discussions and Actions:

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

1. Revisions to 15HR should not affect, diminish, or obsolete products or test data previously accomplished in accordance with earlier editions of API 15HR unless specifically agreed.

The goal is to improve the current standard, and improve the reliability of High pressure fiberglass line pipe. Where major errors or omissions are discovered (where continued practice will negatively impact the reliability of 15HR products) we will specifically identify and obsolete.

Discussion:

None

Agreement:

All agreed
2. **15HR to recommend field hydro test pressure:**

History: 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). API 15HR lacks field pressure testing guidance.

Suggest adding section 11 – Field pressure testing:

*The recommended field pressure test is 1.25 x the maximum system design pressure. (ref: ASME B31.4 - 437.4.3 Leak Testing for hydrocarbon lines). The maximum field pressure test should not exceed 1.25 x the API 15HR Standard Pressure Rating (ref: 1.2.2) as marked on the pipe and components (ref: 9.2 E), this limitation is intended to avoid exceeding stresses produced during the factory hydrostatic mill test (ref: 7.4.1). The field test pressure should be measured at the lowest elevation in the piping system.*

*Note: Additional axial stress may still be imposed on a pipe system due to bending radius and thermal affects specific to the installation. In cases where combined axial stress may approach the long term limitations, a detailed stress analysis is recommended to determine the maximum field test pressure.*

**Discussion:**

- Should we allow some deviation limits to field hydrottest pressure due to normal pressure fluctuations in the field due to temperature change and other influences?
- Does this represent a conflict between B31.3 which requires a test pressure of 1.5X design pressure and B31.4 which stipulates 1.25X?
- Should we included rules governing the details of how the test is conducted such as filling evacuation of air, hold time ect.
- Shail G indicated she did not believe field hydrotesting is in the scope of 15HR because it is a product standard and the topic should be covered in TL4. However it was pointed out that 15HR should list a maximum allowable test pressure to insure the piping system is not overstressed during the hydrottest, which is a product issue/limitation. The group agreed to this.
- Discussion of adding a new appendix listing both the maximum hydrottest pressure limit for 15HR materials, 1.25X standard pressure rating (label), as well as recommended test pressure of 1.25X MAOP.
- Discussed the option of adding a maximum test pressure limit in Section 1 and testing details and recommendations in a new appendix.

**Action:** Vote was taken to add Field test pressure language in 15HR

Favor: **ALL**

Oppose: **None**

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3. **15HR Appendix C:** DSC for pipe add “and components” – verbally agreed June 2010

History: Apparent typographical error
Discussion:

- A request was made to include both $T_{g1}$ and $T_{g2}$. After a detailed discussion of the difference between $t_{g1}$ versus $t_{g2}$ the group agreed $T_{g1}$ should remain “as is” in current 15HR version.
- 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.
- 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.

Action: Vote was taken to add “and components” to C.1
Favor: ALL
Oppose: None

4. Methods to measure $T_g$:

History: DSC is currently the only approved method to measure Tg in 15HR, it has been requested that other methods also be allowed. DSC is still common and the most economical method, there is alternate equipment now available and allowed by other international standards (i.e. ISO 14692).

15HR 7.4.2 - Allow alternate methods for Tg measurement, i.e. TMA, DMA, TGA
Note: (New Tg methods shall be correlated to the original Tg method used when qualification sample Tg’s were measured). Suggest 5 x comparison test on same components by original and by alternate method to determine the new QA - Tg limitations. All Tg methods should report the “as found” Tg or first scan result and this shall be the QA value of interest for pipe and components. Comparison test to convert to a new Tg method shall be recorded and filed with original qualification testing records. Each method requires a procedure reference or 15HR appendix to standardize the approach.

Discussion:

- During the June 2010 meeting, Bill Stringfellow volunteered to review alternate Tg methods, reference Standard test Method for each, also to propose acceptable Tg variance for components.
- Bill did not attend the October 2010 and did not provide an update on this issue.

Action: None
Favor:
Oppose:

5. Specific methods: Test Method for Tg determination by TMA:
TMA - ASTM E1545 Standard Test Method for Assignment of the Glass Transition Temperature by Thermomechanical Analysis

Discussion:

- No action taken on this item pending input from Bill Stringfellow.

Action: None
  Favor:
  Oppose:

6. Other Tg methods, test Standard to follow? DMA, TGA, other?

Discussion:

- No action taken on this item pending input from Bill Stringfellow.

Action: None
  Favor:
  Oppose:

- Summary of Tg discussion # 4 -6. John Biro recommended that items 4-6 be tabled until Bill Stringfellow was in attendance as he was tasked to comment on Tg measurement methods and standards at the last SC15 meeting. – This was agreed.

7. 15HR 5.0 Design, 5.1.1 Regression failure times – Vague requires some clarity

Time frames referenced are identical D2992 and 15HR:

<table>
<thead>
<tr>
<th>Test time</th>
<th>D2992</th>
<th>15HR 3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-1000</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1000-6000</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>&gt;6000</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>&gt;10,000</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Min Total</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

Discussion:

- Detailed explanation of the historic basis for 15HR requirement for failure data points; intended purpose was to limit required length of the test to 6000 hrs.
The current language in 5.1.1 is unclear and often misinterpreted. The purpose of the proposed change is to indicate 0 points are required at 10,000 hrs to clarify that the length of the test is 6000 hrs.

**Action:** Vote to maintain current 5.1.1 hours/number of failures with added note for clarity:

“Differs from ASTM D2992-B as no regression data beyond 10,000 hours is specifically required by 15HR”

**Favor:** All  
**Oppose:** None

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8. **Update 15HR 2.1 “Standard References” to include the latest versions of each.**

History: Mr. Noe Hoijman – from June 14, 2010 meeting: Have 15HR referenced standards been reviewed for latest edition? 15HR 3rd edition currently references only obsolete versions of ASTM:

- D1598-1997
- D1599-1995
- D2105-1997
- D2143-1994
- D2992-1991
- D3567-1991

Committee 15: Are there specific objections to 15HR referencing the most current version of each ASTM standard listed in 15HR 2.1? Justification to maintain obsolete references?

**Discussion:**

- No objection to updating referenced standards to latest edition.
- It was pointed out that we need to update API 5B table number reference
- It was agreed that reference to ASTM D 1694 should be removed as this standard has been withdrawn and these threads are no longer commercially available.
- Consideration was given to removing the dates from the individual standards and including a statement in 2.1 that the latest edition of the listed standard should apply.

**Action:** Vote to update the referenced standards to the latest edition, remove reference to ASTM D 1694 and update API 5B reference table number.

**Favor:** All  
**Oppose:** None

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9. **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

Per API Q1 and ISO 9001 – measurement and inspection equipment is required to be “traceable to international standards” - There is no requirement to “own” or even have “access” to the international standard.

Per API 5B 6.1.2 “the manufacturer of product threads shall provide working gages ....” - No requirement in API 5B to own Master gages, only to use working gages calibrated and traceable to a Master, frequency and calibration requirements are detailed in API 5B.

Discussion:
• Alternate Pipe Connections, “AC” joints are allowed and cannot have traceability to international standards.
• Noe volunteered to draft new language for proprietary “AC Joint” working and master gage relationship to following the same “intent” as API 5B standard gages.
• It was reiterated that the suggested change to 5.3.4 is only to clarify the wording “own or have access” as it applies to API 5B threads.

Action: Vote to revise 5.3.4: “Manufacturer shall have working gages calibrated and traceable to API Master gages. The calibration of working gages shall be in accordance with the requirements of API 5B, and in accordance with the quality management system, such that working gages are “traceable to an international standard”.

Favor: All
Oppose: None

10. 5.2.2 , Table 1: Minimum Inside Diameter
History: This table is sometimes interpreted that “15HR can only be applied to pipe diameters listed in table 1.

Recommendation to maintain API published minimum inside diameters “as is” up to 12 inch = 11.75”. Recommended minimum inside diameter for sizes 14-24” should not be less than SCH 100 steel. Alternate recommendation, minimum inside diameter for pipe sizes greater than 24” shall be agreed with purchaser.

Discussion:
• It was suggested we don’t actually list minimum inside diameters for pipe sizes larger than NPS 12 in Table 1 but simply list revise the language in 5.2.2 to indicate the minimum inside diameter for pipe larger that NPS 12 shall be schedule 100 or greater.
• Some believed that Table 1 should list minimum ID’s.
Pipe ID Based on Schedule 100

<table>
<thead>
<tr>
<th>Nominal Pipe Size (in)</th>
<th>Inside Diameter (in)</th>
<th>Outsider Diameter (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Metallic reference only</td>
</tr>
<tr>
<td>10</td>
<td>9.314</td>
<td>10.75</td>
</tr>
<tr>
<td>12</td>
<td>11.064</td>
<td>12.75</td>
</tr>
<tr>
<td>14</td>
<td>12.126</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>13.398</td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td>15.688</td>
<td>18</td>
</tr>
<tr>
<td>20</td>
<td>17.44</td>
<td>20</td>
</tr>
<tr>
<td>24</td>
<td>20.398</td>
<td>24</td>
</tr>
</tbody>
</table>

- No consensus reached on this issue.
- It was noted that increasing pipe diameter may require a change in the manufacturing process. Changes in manufacturing process may require reconfirmation to establish the HDB or PDB established in section 5.1.
- David Granderson will draft alternate language for paragraph 5.2.2 to clarify that 15HR is not limited to NPS 10 pipe.

**Action:** No vote taken

**Favor:**

**Oppose:**

11. 4.2 Pressure rating, 1.1 Scope

Now reads 500 – 5000psi increments of 250psi.

History: As diameters increase, decreasing pressure rating increment should be considered.

Suggested revision: For diameters 1” through 12” maintain Pressure ratings in 250psi increments. For diameters > 12” allow pressure ratings from 500 psi in 100psi increments.

**Discussion:**

- Some end users expressed concerned feeling that this could lead to too many option in pipe and could have an impact on their inventory.
- The current proposal will eliminate the older 250 increment series pipe so an owner could no longer order 750 psi pipe it would be 700 or 800.
• Using increments of 125 psi and 50 psi were discussed.
• Final consensus; use 100 psi increments for pipe larger than NPS 12.
• This change may require updating the language in paragraph 1.1.1 and 5.1.1.

**Action:** Vote to revise paragraph 4.2 to modify pressure rating increments in 100 psi for pipe sizes larger than NPS 12.

**Favor:** All
**Oppose:** None

12. **4.2 Pressure rating and 15HR intent:**

History: As an international specification, the arbitrary pressure assignments do not always follow the local requirements and terminology. i.e. API 15HR does not intend to exclude pipe and components where other pressure units are common. 15HR products may comply with the design and intent and not follow the arbitrary “standard” Pressure rating increments. i.e. flange ratings per ASME B16.5, International pressure terms in SI units, etc. Pressure units other than API 15HR standard may be allowed where specifically agreed by manufacturer and purchaser.

**Discussion:**

• This would allow a purchaser and manufacturer to agree on any pressure rating pipe at any increment.
• Would this impact the change to allow 100 psi increments above 12”?
• Discussion of metric conversions, Shail mentioned including in metric table in annex 5b.
• API feels we need to consider metric units.
• Including a note that we should not exclude other ratings was discussed.
• Alternate rating on label in addition to 15LR standard rating?
• Chair recommended we table the issue and take no action until further consideration of the issue.

**Action:** Issue will be tabled and given further consideration at a later date, no vote taken.

**Favor:**
**Oppose:**
13. 5.1.1 Pressure rating equations

**History:** ASTM D2992 Pressure equation = API 15HR eq 2 = ISO 14692 pressure equation. API eq 1 is not common; complications arising from the non-standard pressure equation (1) outweigh any perceived benefits.

Compare results of API 15HR eq1 with eq 2:

<table>
<thead>
<tr>
<th>Ss</th>
<th>SF</th>
<th>ID</th>
<th>OD</th>
<th>T</th>
<th>OD/t</th>
<th>eq 1 (Pr)</th>
<th>eq2 (Pr)</th>
<th>Change (Pr)</th>
<th>% diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>16000</td>
<td>0.67</td>
<td>2</td>
<td>2.5</td>
<td>0.25</td>
<td>10</td>
<td>2353</td>
<td>2382</td>
<td>29</td>
<td>1.23%</td>
</tr>
<tr>
<td>16000</td>
<td>0.67</td>
<td>2</td>
<td>2.4</td>
<td>0.2</td>
<td>12</td>
<td>1933</td>
<td>1949</td>
<td>16</td>
<td>0.83%</td>
</tr>
<tr>
<td>16000</td>
<td>0.67</td>
<td>2</td>
<td>2.3</td>
<td>0.15</td>
<td>15</td>
<td>1489</td>
<td>1496</td>
<td>7</td>
<td>0.49%</td>
</tr>
<tr>
<td>16000</td>
<td>0.67</td>
<td>2</td>
<td>2.2</td>
<td>0.1</td>
<td>22</td>
<td>1019</td>
<td>1021</td>
<td>2</td>
<td>0.23%</td>
</tr>
<tr>
<td>16000</td>
<td>0.67</td>
<td>2</td>
<td>2.096</td>
<td>0.048</td>
<td>44</td>
<td>502</td>
<td>503</td>
<td>0</td>
<td>0.05%</td>
</tr>
</tbody>
</table>

Move to revise 5.1.1 to a single compatible equation for pressure rating (eq. 2)

Pr = \((2 \times t \times Ss \times Sf) / (D)\), \(Sf\) was missing from equation 2 in 15HR 3rd ed, corrected later.

**Discussion:**
- Some concern expressed over measuring ID and OD accurately and the potential impact.
- Concerned expressed that we need to look at D/t less than 10.
- Examples calculations were presented with D/t ratios of 6 and 8, in several sizes and it was agreed the impact was insignificant.

**Action:** Vote to revised paragraph 5.1.1 and eliminate equation (1) and publish only equation (2)

**Favor:** All

**Oppose:** None

14. 5.1.1 OD/t limitations for scaling

**History:** Currently unlimited scaling of pipe hoop stress requires regression testing of OD/t <= 10

Reference to OD/t : thin/thick wall theory
- Roark and Young 5th edition: Formulas for Stress and Strain
- Shigley and Mischke: Mechanical Engineering Design 5th edition
  Both separate Thin / Thick pressure vessel theory at: OD/t = 40

Other references define OD/t = 20 thick/thin wall, 10 can be found but is uncommon

Results of the current language: Only the smallest diameter “API standard joints” i.e. 2 3/8 – 3 1/2” can survive an ultimate pipe wall pressure test with an OD/t = 10. Complications arise with both ASTM D2992 regression and ASTM D1599 burst testing.
Experience shows that testing pipe with OD/t <= 10 does not necessarily produce more conservative HDB’s (design stresses), primarily from mixing failure modes in long term testing.

**Discussion:**

- Poll experience from other manufacturers present and all agreed.
- Suggest adjustment to the current OD/t limitations: Replace OD/t <=10 with “OD/t <= 20” to allow unlimited scaling of long term hoop stress determined by qualification regression testing.
- Discussion moved off topic to the issue of, should regression testing include joint or not include a joint, which is unrelated to this suggested revision.
- Noe was adamant that joints should be included in pipe regression however the group consensus was that mixing modes of failure in a regression test result in unreliable pipe wall stress data.

**Action:** Vote taken to revise allowable scaling OD/t limit from 10 to 20

Favor: All
Oppose: None

15. 9.2 Component markings

History: Each component produced per API 15HR “shall be marked” with the following

- Manufacturer’s name or mark.  
- “15HR” (and A.C. notation, if applicable).  
- Nominal size.  
- Unique identification number.  
- Specification 15HR Standard Pressure Rating  
- Date of manufacture.  
- 15HR standard temperature rating at (150°F) - addition  
- Additional information as requested by purchaser, i.e. rating at higher temperature – addition

Reference: 1.2.2, 5.1.1, 7.4.1, 9.1, Appendix G

Standard temperature rating i.e. 150°F should be included in the marking requirements. Markings in addition to (9.2 a-f) are allowed in 9.1, these are only the “Minimum requirements” allowing onsite ability to identify the standard API 15HR performance requirements without a specification in hand.

Suggest revision to 9.2 to add new (g): “15HR Standard temperature rating = 150°F”

**Discussion:**

- The question was raised as to how one would mark the pipe for a 200F rating.
• It was explained that all pipe must be rated at 150F to establish standard rating which provides the basis for factory and field hydro testing.
• It was noted that the API label must include the 150F pressure rating, but does not exclude other markings such as a pressure rating at 200F.
• A suggestion was made to add “h” to indicate “added information as requested by purchaser”.
• Discussion of revising “e” to indicate “Specification 15 HR Standard Pressure Rating at 150F”.

Action: Vote taken to add “g. 15HR Standard temperature rating = 150°F” to 9.2

Favor: All
Oppose: None

16. 5.4 Requalification or “reconfirmation” in ASTM – Minor terminology issue

History: API15HR 5.4 and ASTM D2992 12 have different terminology for the same process, this may add to the apparent confusion. ASTM D2992- refers to “Reconfirmation” and API 15HR refers to “Requalification”

Discussion:
• None

Action: Vote taken to amend the language in 15HR, 5.4 to indicate “Reconfirmation”

Favor: All
Oppose: None

17. 5.4 Clarify in 15HR the “changes” which require “Reconfirmation by regression testing”

History: ASTM D2992 guidance on Reconfirmation: 5.6 This practice is valid for a given pipe or fitting only so long as the specimens are truly representative of that material and manufacturing process.

5.6.1 Changes in materials or manufacturing processes will necessitate a reevaluation as described in Section 12.

12.1 When a piping product has an existing HDB or PDB determined in accordance with Procedure A or Procedure B, any change in material, manufacturing process, construction, or liner thickness will necessitate a screening evaluation as described in 12.2, 12.3, 12.4, 12.5, and 12.6.

Major changes identified by ASTM D2992 are materials, process, and construction

Compare to 15HR appendix A
15HR edition 1: reference only materials, process, and construction variables similar to ASTM D2992 including “liner”
15HR edition 2: several variables added not related to pipe regression testing (A.5-A.8), with insufficient details in A.9 Manufacturing, dropped “liner thickness” as required by D2992.
Suggest modification to 15HR to match the requirements of ASTM D2992 – Agree on details to be added to each A.9 Manufacturing change to clarify “Major from Minor” and the potential relation to regression testing.

**Discussion:**

- Noe brought up the question of liner material and it was revealed that a spoolable pipe manufacturer had received an API 15HR license.
  - All manufacturers of fiberglass pipe present and most others felt strongly that spoolable pipe with thermoplastic liner should not be included in 15HR standard.
  - Shail recommended hold on discussion of this topic.
  - Discussion of changing scope to be clear that thermoplastic lined pipe is not included.
  - Shail indicated that the issue would be dealt with internally at API and it was not a topic of discussion for the 15HR meeting.

- Discussion of action resumed on Appendix A and it was agreed that A.5, A.6, A.7 and A.8 were not relevant to product reconfirmation requirements. It was agreed removing these items from appendix A would eliminate future confusion on factors influencing the need for product reconfirmation.

**Action:** Vote was taken to remove A.5, A.6, A.7 and A.8 from Appendix A.

<table>
<thead>
<tr>
<th>Favor</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oppose</td>
<td>None</td>
</tr>
<tr>
<td>Abstain</td>
<td>1 Noe</td>
</tr>
</tbody>
</table>

**18. 5.4 Regression testing Requalification – related to “manufacturing location”**

History: (ASTM D2992 & API 15HR 3rd edition) do not require a full regression test (6,000 or 10,000) hours based on manufacturing location (country, state, county, city, or distance from original location). Additionally, neither ASTM D2992-B nor API 15HR 3rd edition require “requalification / reconfirmation” based on “location”. The requirements for “reconfirmation are clearly indicated in both standards and do not identify “location” as a major change. Where a manufacturer has completed regression testing on a product family – “same materials, construction, and process” and does not change the process or materials, there is no requirement to perform further “reconfirmation” by regression testing.

There is some confusion in the international market, where some are of the opinion that 15HR 3rd edition requires each factory location to complete either:

A. A full 18 point regression test to comply with API 15HR.
B. A shorter term 6 point “Reconfirmation” regression test is required by 15HR.

API 15HR 4th editino requires clarity on this issue to avoid further confusion. Options for under consideration:
• Maintain the current intent, requiring No reconfirmation testing for currently licensed products which differ only by a change of location.
• Mandate a full regression test of products manufactured at each location.
• Revise 15HR to require the shorter term Re-confirmation test for location changes.

Recommendation: revise API 15HR 5.4 to clearly state intent.

Discussion:

15HR 4\textsuperscript{th} edition discussion:
• It is believed that a new factory should have some form of reconfirmation due to a change of location to ensure no design detail was missed, but a full regression test is not required if the new location has representative product regression data and will be manufacturing the same products at a new location.
• Need to define distance which requires “requalification”, discussion of what constitutes a new facility, new building at same locations or a change of physical address.
• It is agreed that this should not apply to expansion of an existing facility.

Action: Vote taken, it is agreed that the shorter term “reconfirmation test per ASTM D2992, section 12” would be a reasonable requirement and should be included in the revised 15HR 4\textsuperscript{th} edition based on change of location will be added to app A (this will exclude expansion of an existing facility).

Favor: All
Oppose: None

19. Appendix A: A.9 Manufacturing detail- (tolerances +/-)

Cure temperature and time:
• OD/t = 10 qualified likely requires cure times > product produced with OD/t = 20 due to component mass.
• Suggest: Cure schedule changes resulting in:
  Substantially higher cure temperatures or substantially shorter cure times may require reconfirmation testing.

Discussion:
• Some believe it should be dropped completely, it was agreed to remove the requirement and make it a cautionary foot note.

Winding angle:
• Suggest: +/- 5° change in the average reinforcement angle from that of qualified samples requires reconfirmation.

Discussion: It was agreed that +/- 5° wind angle was a reasonable limit and should be included.
Stacking sequence:
- Suggest: replace with “Layer thickness” average layer thickness increases > 20% require reconfirmation

Discussion:
- The definition of this term was discussed in some detail. It was explained that this relates to pipe manufactured with layer of differing composition and/or different wind angles. A change in the sequencing of the layers with different materials and/or different wind angles would constitute a change in “stacking sequence”
- The manufacturers agreed this is not a common practice.
- It was agreed to delete reference to “Stacking sequence”

% reinforcement in each direction:
- Suggest: Average change of +/- 10 % requires reconfirmation.

Discussion:
- It was agreed to remove this completely.

Glass Transition temperature (Tg):
- Suggest: When proposing to lower the minimum Tg of qualified components, or change the average component Tg by more than +/- 10°C of qualified components.

Discussion:
- It is agreed that reconfirmation is required only when you reduce the standard Tg by 10°C or more. Nothing should be required for an increase in Tg.

Thread dimensions:
- Suggest: remove - find alternate method for Joint qualification - not relevant to ASTM D2992 pipe HDB, or 15HR protocol where Joints are not mandatory in the first 6,000 hours.

Discussion:
- It is agree to delete this as it is not related to reconfirmation of the pipe stress.

Liner Thickness:
- Add back in to Appendix A under “manufacturing”
- Suggest: average liner thickness changes of +/- 10% from qualified components require reconfirmation.

Discussion:
- It is agreed that any reduction in liner thickness would require reconfirmation, but the liner thickness can be increased without reconfirmation. This will be added to A.4 and removed from A.9

Action: Upon review of the A.9 topics and decisions, a vote was taken to remove A.9 totally and include reductions in liner thickness in A.4

Favor: All
Oppose: None
20. Appendix A: A.5 – A.8 not related to ASTM D2992 reconfirmation testing

History:

A.5 Adhesives -
Manufacturer
Product designation

A.6 Thread Molding Compounds
Manufacturer
Product designation

A.7 Thread Sealing Compounds – Thread dope
Manufacturer
Product designation
Generic type
Solids weight percent, size distribution, material and shape

A.8 Joint Sealing Element - Elastomers
Manufacturer
Product designation
Shore “A” durometer hardness
Seal dimensions

A.5 – A.8 are not pipe wall related, not considered by the required ASTM D2992 regression testing required for this standard, should be removed from Appendix A or specifically excluded from Reconfirmation testing.... All are joint related items, API 15HR does not require joints in regression testing less than 6000 hours, and reconfirmation maximum time are only >1000 and < 3000 hours.

Discussion:

• No real discussion on this issue.
• See action item 17 above it was previously voted and agreed to remove A.5,A.6,A.7 and A.8

Action: Vote taken to remove A.5 – A.8:

Favor: All
Oppose: None

21. Independent witnessing of “qualification” testing

History: No requirement in 15HR or ASTM D2992 to have qualification testing witnessed by an independent party.

a. Action item June 14, 2010 p. 4: Shail Ghaey – to verify whether or not API can “require” independent witnessing of an API licensee. Is 3rd party witnessing common practice in other API standards? Results?

Discussion:

• No follow-up by Shail on this issue.
• The consensus is that this president does exist in other API standards.
• Noe wants 3rd party witness for all testing to be required.
• No major objection from manufacturers, however all agreed this would increase the price of products and would but would likely offer no benefit or additional guarantee of quality to the end user.
• The consensus is that API15HR does not restrict the use of 3rd part inspectors however it is not necessary to mandate. If required this should be defined in the owners material specification and/or purchase order documents.

**Action:** A vote was taken on the action to formally **require independent certification of test data in 15HR beginning with testing completed after publication of 4th edition of 15HR** (will not have affect on previous testing)

<table>
<thead>
<tr>
<th>Favor:</th>
<th>(1)</th>
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<tbody>
<tr>
<td>Oppose:</td>
<td>15</td>
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**22. 5.1.1 “minimum” reinforced wall thickness**

Reference: 5.2.2, 5.1.1, 7.4.6, 8.2, ASTM D3567

History: 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 of concern by clear definitions which are not apparent in ASTM D3567.

Accept some definitive solution to defining wall thickness measurements.

Write down SC15 consensus to wall thickness discussion.

**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.
• 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.
• It was proposed that a manufacturer should publish a minimum wall, with the intent being that no section of pipe would exhibit a wall thickness less than the published minimum.
• After considerable discussion no consensus was reached.

• Blain volunteered to review David’s work and propose a recommendation for review between meetings. **Action: No vote taken day 1. Wall thickness definition agreement was reached on second day, between Blaine, Noe, and David. Primary debate was between David and Noe on day 1. Wall thickness presentation attached, to be finalized next meeting.**
• Not completed, separating Joint qualification from Pipe – important
  o Treat joints like all other components, prove by regression that the joint long term strength \(\geq\) pipe. Same as fittings qualification. Discussion?

Wednesday, October 20th 2010

Discussion of applicability of AP15HR to spoolable pipe lined with thermoplastics. It was proposed that the scope of 15HR be revised to specifically state that it excluded spoolable pipe with a thermoplastic liner.

Discussion:
• It was proposed spoolable structural wall cannot meet visual inspection due to crazing of the thermoset during spooling.
• Burst test requirement 7.4.3 must include a fiberglass pipe joint, not possible for spoolable materials.
• 6.1 process of manufacture is not applicable to spoolable pipe.
• 1.2.2 Bend radius limitation violated by spoolable pipe.
• 15TL4 not applicable to spoolable pipe.
• Oxy, Steve White solicited opinions from others in his organization; the consensus was that the 15HR was not intended for spoolable pipe, which is why a separate RP exists for spoolable pipe and development for a full specification is being explored by Blaine Weller now.
• It was pointed out that mixing of multiple materials in one standard is difficult and leads to confusion and potential difficulty making future changes. This has been the experience of ASME in B31.1 and B31.3, many non-metallic materials are handled in one section and revisions to the code are difficult and changes in one material often lead to problems for others.

Action: Vote taken to revise the scope of API 15HR to specifically exclude spoolable pipe with a thermoplastic liner.

  Favor: 9
  Oppose: 1
  Abstain: 6

David Granderson will develop the details of this proposed revision and distribute for comments between meetings.
A request was made to change short term test pressure test requirements:

- For determination of R4 (qualification/requalification) extend test time to 2-5 minutes
  - Method A: For production control one test per 5000 ft test time 2-5 minutes.
  - Method B one per 15000 feet

**Discussion:**

- Manufacturers suggested a step (load/hold) test.
- This method is not defined and would require modification to ASTM D 1599 or a new appendix in 15HR to define the details
- Tom Walsh volunteered to investigate making a change to ASTM D 1599 to describe the load hold test.

**Actions:** No vote was taken; SC15 will await feedback from Tom Walsh on changes to ASTM D 1599.

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Fitting/joint qualification: Currently HR requires regression testing of pipe to include joints. Mixing joint failures with pipe wall failures spoil pipe regression data, and does not produce a reliable stress value for the pipe wall as intended.

**Discussion:**

- Add joints to the fittings qualification
- Re-qualify joints to joint regression
- Re-qualify fittings to fitting regression.
- Use fittings test per 5.1.2 for joints.
- Some discussion of extending time from 2000 to 3000 or 6000 hrs using 6 fittings. Request John Biro and Paul to consider increase in testing of joints/fitting both in test time and number of samples required report their recommendations for consideration between meetings.
- General consensus on this issue from the group to further separate joint/fitting qualification from pipe wall qualification as pipe is easily scalable and fitting/joints are not. Intention is to increase the confidence in pipe, fitting, and joint qualification testing.

**Action:** No vote taken

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**Appendix H – Data Sheet:**

- A request was made to revise Appendix H data sheet to clarify that current test pressure field in the data sheet is intended for the for field hydrotest pressure. All agreed to the change.
- A request was made to revise the Appendix H – Add a section to this form to include additional API label information requested by the owner or purchaser. All agreed to this change.
Who will provide proposal for next meeting?

1.2.2 – Review this section to possibly increase the occasional cyclic pressure from 120% to a maximum of 125% to match the maximum hydro test pressure case which can potentially exceed the 120%.

Noe presented a discussion of thread protectors in section 10.2. No formal action taken on this item.

8.1 – Published properties – (h) – Suggestion to remove requirement for publishing elevated temperature ASTM D 1599. Noe wants to make sure that we specify which method in ASTM D 1599 procedure A or B would be used.

8.2 published dimensions – It was pointed out that if we make revisions or clarifications to the minimum reinforced wall, we may need to make changes to 8.2(F). This was provided for informational purposes pending the outcome of item 22 above.

End discussion of 15 HR

Discussion of 15LE – All Wilkes Chair – See attached API 15LE Report for details

- Recommendation to remove standard for PVC lined steel to remove API 15LT. Vote taken all approved
- Discussion of test frequency for short term pressure test.
- Vote taken group approved changes in language as proposed to 7.2.3.2 for both D1599 and D2290 testing all approved.
- All Wilkes will make some slight grammatical changes and submit to Shail.
- Proposal to add ASTM F 2619 – Vote taken all approved.

End API 15LE Discussion

Discussion of 15TR – John Biro

- Fiberglass down hold tubing no API specification, API 15 TR is a draft standard that was never complete, good technical document to much testing.
- The current draft would include multiple 10,000 hr regression test in a combination of pure hoop and pure axial with various other ratios of hoop to axial loading including 2:1 and 1:1, in tension and compression. Could involve up to 20 tests to qualify.
- General consensus was this would not be practical
• The other option is to compare the design methods of all three manufacturers and agree on a “best practices approach”.
• All manufacturers agreed to the “best practices” approach

Action: 15TR work group formed: John Biro, David Granderson, Paul B, and Craig Moore
John B will lead the group.

End API 15TR discussion

Discussion of Spoolable – 15S
• Blain will write draft standard distribute to his work group for review and comment.

End API 15S discussion

Meeting adjourned