1.0 OPENING SESSION – Tuesday, January 19, 2016

1.1. The opening session of the main committee meeting was called to order by the Chair at 1:06 PM. The hotel and ballroom exits were described and safety information was reviewed. The sign-in sheet was passed around.

1.2. The Chair invited everyone in the room to introduce themselves.

1.3. The Chair asked voting members to raise their hands and those with proxies to signify their proxy as well. There were a total of 24 voting members and proxies in attendance establishing a quorum.

1.4. The Chair asked for a motion to approve the minutes of the 2015 meeting in New Orleans. Chuck Woodruff made a motion to approve the meeting minutes as written and Dave Culberson seconded the motion. The minutes were approved by unanimous vote.

1.5. The agenda for the opening session of the meeting was presented. There was a slight schedule adjustment to the agenda, which was noted by the Chair. Dave Culberson made a motion to approve the agenda as amended and Aaron Litschewski seconded the motion. The agenda was unanimously approved.

1.6. API staff presented the annual update – see Attachment A. In regard to the current open ballot (Ballot 3736), API staff highlighted that an interested party does not have to be a voting member of the committee to comment on a ballot.

The current edition of the standard (Twenty-first) was published in September 2013 and is currently in the maintenance mode of the five-year review cycle, meaning that the next edition is due in 2018. The schedule for the development of the next edition (Twenty-second) was reviewed.

It was agreed that a meeting of the Interpretations Task Group (ITG) from here on out would occur on the first day that the API 1104 committee meets each January. The ITG may also meet between meetings, typically when 10 or more requests for interpretation are accumulated.
Documents of interest to the API 1104 committee were introduced, which included API RP 1177 – Recommended Practice for Steel Pipeline Construction Quality Management Systems.

The voting membership of the committee was reviewed. Three of the 28 voting members have changed since the 2015 meeting in New Orleans. Voting members in attendance were introduced and asked to stand up.

1.7. The Chair reviewed the purpose of subcommittees and introduced the subcommittee co-chairs. He asked first time attendees to please introduce themselves when attending subcommittee meetings. The Chair encouraged new attendees to participate and to please let one of the co-chairs know if you are interested in becoming a member of that subcommittee. The Chair emphasized the importance of participation in the subcommittees, which are used to further develop the standard.

Areas of the agenda were identified as needing to be updated including new chairs for the Mechanized Welding Subcommittee (Bob Huntley and RJ Hammer) and the addition of the several task groups, including the NDT Task Group for In-service and Repair Welding (Matt Boring and Allan Beckett), the Radiographic Testing Task Group (Dave Culbertson and Tom Reader), the Task Group for Table 1 (Bill Bruce and John Lee), and the Annex A Task Group on Installation ECA (Frans Kopp and Robin Gordon).

The Secretary announced that the Task Group for Table 1 would meet immediately following the opening session of the main committee meeting.

1.8. The Chair asked that any old business be discussed. A question was asked regarding the protocol for participation in a task group. The Chair explained that those interested need only express their interest to the task group chair(s), introduce themselves, and participate.

1.9. Bill Bruce gave a presentation on improvements to API 1104 for the Twenty-second Edition, highlighting several examples of ambiguity that need to be addressed – see Attachment B. He encouraged the group to use the time in subcommittee meetings to work toward reducing ambiguity. The Chair likewise encouraged those who know of ambiguity in the standard to take those items to the appropriate subcommittee meetings.

1.10. Yong-Yi Wang gave a presentation on the impact of girth weld high-low misalignment – see Attachment C. This presentation included some of the results from Phase 1 of a project sponsored by Pipeline Research Council International (PRCI).

Yong-Yi Wang also gave a presentation on girth welds in newly constructed pipelines, which highlighted heat-affected zone (HAZ) softening of modern micro-alloyed high strength pipeline steels – see Attachment D.

1.11. The opening session of the main committee meeting was adjourned at 2:55 PM.
2.0 CLOSING SESSION – Thursday, January 21, 2016

2.1. The closing session of the main committee meeting was called to order by the Chair at 1:04 PM. He reviewed the safety exit information. He asked for a count of the voting members and those with proxies of voting members and established a quorum. The sign-in sheet was passed around again.

2.2. Gery Bauman from the US Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) presented the DOT PHMSA report – See Attachment E. Gery Bauman indicated that he was filling in for Ken Lee, who is the PHMSA representative to the API 1104 committee.

The current notice of proposed rulemaking (NOPR) that affects the Code of Federal Regulations (CFR) Parts 192 and 195 in the areas of welding was described. This NOPR will recognize the acceptability of welding procedures qualified in accordance with Sections 12 and Appendix A of API 1104 in addition to Section 5. The current version of the NOPR does not include reference to Appendix B.

An update on the NOPR for incorporating the Twenty-first Edition of API 1104 by reference into CFR Parts 192 and 195 was also given. The estimate is that this NOPR will be released in the Fall of 2016 and that Twenty-first Edition will be adopted by final rule in the first quarter of 2017. Contact information for the individual responsible for this process at PHMSA was provided.

It was reported that the proposed rulemaking requiring that work may not be inspected by the person who performed the work (§192.305 and §195.204) was placed on hold as the result of comments received from industry during the comment period.

The case of a cracked tie-in weld with high misalignment was presented, including PHMSA’s response and Gery Bauman’s own comments and thoughts. The committee was encouraged to give thought to using a risk-based approach to preventing hydrogen cracking and to think about encouraging the use of best practices for radiographic inspection. Particular attention was given to the text in §192.225 and §195.214 regarding documentation of welding procedures and the records that support them. The CFRs state that the records must be retained and followed whenever the procedure is used. The text in Section 12.5.1 of API 1104 that states that a welding procedure must be completely requalified when an essential variable is changed was discussed.

2.3. Marie Quintana gave a presentation titled “Alternative Approach to Essential Welding Variables” – see Attachment F. The presentation focused on the results of a four-year project that was carried out between the Lincoln Electric Company and Center for Reliable Engineering Systems (CRES). The study examined essential variables among various codes and standards and the effects these variables and their interactions have on the resulting weld properties. The primary drivers are the combination of base material chemical composition and the weld thermal cycle, which control the microstructure and the resulting weld properties. The focus of the presentation was
measurement of true heat input when using advanced waveform power supplies. The methodology that was developed allows for estimation of the resulting weld properties with good reliability, which reduces cost and shortens schedules. The results of this research have been published and a resource list can be made available to the group.

2.4. At 2:15 PM, the attendees took a brief break and resumed the meeting at 2:30 PM.

2.5. The Chair took a straw poll on having a meeting during the summer of 2016. It appeared that there were equal numbers for and against.

2.6. The Chair invited presentations from each of the subcommittees and task groups.

Annex A Task Group on Installation ECA – Frans Kopp – see Attachment G. The use of Annex A is currently limited to applications where actual strains are less than 0.5% regardless of if these occur during construction or in service. This has caused issue with reeling contractors who come from Europe and use codes and standards such as DNV-OS-F101. A task group was created to address applications for offshore installation where installation strains are greater than 0.5%. It is anticipated that this topic will be the subject of a new annex in API 1104 (e.g., Annex D) and will deal not only with reeling but with any installation operation that produces strains greater than 0.5%. A decision was made to reference work already done in European codes and standards that addresses this type of situation, namely DNV-OS-F101. A holistic approach will be used in the development of this new Annex. The task group created to work on this new annex consists of 14 members.

Fracture Mechanics Subcommittee – Yong-Yi Wang – see Attachment H. Yong-Yi Wang summarized the activities of the subcommittee which included actions items for Annex A in the Twenty-second Edition of the standard. Subcommittee members were assigned to each action item with plans to discuss the work at a future meeting of the subcommittee. Names of those interested in strain-based ECA for onshore pipelines were collected. The task group on installation ECA for reeling applications was presented earlier.

General Interest Subcommittee – Tim Burns – see Attachment I. This committee was formed to look after areas of the standard which do not currently fall under the purview of any other subcommittee. The basic scope of work for this subcommittee was reviewed. The group will examine the interpretations database for the Twentieth and Twenty-first editions, the PRCI guidance document for API 1104, and work to harmonize the standard as a whole. Recommendations via email for a better name for this new subcommittee were requested by the Chair.

In-service Welding Subcommittee – Bill Bruce – see Attachment J. As Gery Bauman indicated earlier, Appendix B will not be included in the upcoming NOPR, as had been proposed in the original version of the NOPR. This was discussed during the subcommittee meeting along with PHMSA’s position on the treatment of 'should'
statements in industry standards. Requests for interpretations were reviewed by the subcommittee and changes needed in light of these were discussed. The majority of the subcommittee meeting was spent discussing needed changes to Annex B for the Twenty-second Edition of the standard and the desire to make Annex B more of a stand-alone section that does not require reference to the main body of the standard. Several other improvements and corrections to Annex B were also discussed in detail and working groups were established to move those improvements forward.

**Task Group on NDT for Repair and In-Service Welds** – Matt Boring – see Attachment K. The task group met for two hours with 26 in attendance. Two working groups were created; one to look at inspection of in-service welds and another to look at inspection of repair welds during new construction. This task group has a goal of providing guidance in the Twenty-second Edition of the standard for NDT of in-service welds and repairs to pipeline girth welds.

**Mechanized Welding Subcommittee** – Bob Huntley – see Attachment L. The two new chairs for this subcommittee are Bob Huntley and RJ Hammer. The subcommittee meeting was attended by 30 people. Joel Troyer gave a presentation on heat input calculation using traditional methods and using methods appropriate for advanced waveform power supplies. Two groups were created. The first group will review the references to Sections 5 and 6 in Section 12 so that information can be brought into Section 12. The goal of this group is to make Section 12 a more independent section. The second group will review the technical requirements for essential variables for mechanized welding with a goal of updating this section for the Twenty-second Edition. This group will interact with the Fracture Mechanics subcommittee for issues regarding Annex A. The groups will meet in the Spring and Fall to move the work forward.

**Task Group for Table 1** – Bill Bruce. The task group met briefly to discuss the letter ballot for Addendum 2 to the Twenty-first Edition of API 1104 (Ballot 3736), which includes changes to Table 1. The content pertaining to Table 1 was reviewed, several comments that had been received to date were discussed, and an open discussion was held for those who had not yet voted. For the one negative voter who was in attendance, the group acknowledged the changes in the letter ballot were not a complete solution to the need for improvement and that the work of the group would continue with a complete reassessment of the essential variable requirements for filler metals in general (i.e., what changes should and should not be allowed without requalification). Jon Lee agreed to take over as the chair of this task group moving forward.

**Nondestructive Testing (NDT) Subcommittee** – Dave Culbertson – see Attachment M. There were 14 members and 25 visitors present at the NDT subcommittee meeting. Acceptance criteria for tungsten inclusions were discussed as part of work performed by the Radiographic Testing Task Group. Acceptance criteria for small diameter branch connections for both new welds and repairs were also discussed. New business included discussion of revisions to the figures for acceptance criteria for porosity.
Volunteers came forward to liaise between the NDT Subcommittee and the Task Group on NDT for Repair and In-Service Welds. Bob Bates gave a report from the AUT task group. There was discussion pertaining to the need to develop inspection criteria for welds in corrosion resistant alloys (CRAs).

**Automatic UT Task Group** – Bob Bates – see Attachment N. This task group was formed to review and develop improvements to Section 11.4 in the standard. The goal is to have a revision of Section 11.4 completed for submission to the main committee by June 2016. Several task group meetings will be held between now and then. A new work group was created to examine the use of manual UT.

**Radiographic Testing Task Group** – Dave Culbertson – see Attachment O. The charge of the task group was discussed. Fourteen work items were identified and two work groups were created to address those items. One work group was assigned to work on items related to the acceptance standards in Section 9.3 (Radiographic Testing). The other work group was assigned to work on items related to NDT procedures in Section 11.1 (Radiographic Test Methods), which will cover film radiography, and digital radiographic (DR) and computed radiographic (CR) technologies. The work groups were encouraged to reach out and enlist others with expertise in these technologies that can assist them with their assignments. The two work groups will report back to the Radiographic Testing Task Group periodically as they progress towards recommended items to bring forward to the main committee.

**Repair Welding Subcommittee** – Alan Beckett – see Attachment P. The group reviewed the requests for interpretations that had been submitted. The group identified areas of Section 10 that will need to be updated for the Twenty-second Edition. Eight areas for improvement were also discussed and potential solutions were identified. An item to be included in the next addenda to the Twenty-first Edition was identified; the word ‘without’ in 10.2.3 (Repairs of Defects Other Than Cracks) was inadvertently changed to ‘with’. An action was requested of the Chair to check to see if the ballot to accept the Twenty-first Edition included the wrong wording (Action Item 2016-1). If the wording was inadvertently changed after the ballot was approved, then the change can be made as an erratum as opposed to an addendum. There was good discussion around the qualification of repair welders and the intent of the standard. This ambiguity will need to be clarified going forward. No working groups were created but several solutions were discussed which will be included in the subcommittee meeting minutes.

**Welding Procedures and Welder Qualification Subcommittee** – Bill Marhofer – see Attachment Q. There were 39 in attendance, 13 of whom were subcommittee members, which established a quorum. The ballot item that is open for voting (Ballot 3736) was discussed briefly. The presentation given by Bill Bruce during the opening session of the main committee meeting was reviewed to identify areas of ambiguity in Sections 5 and 6 that can be cleared up in the Twenty-second Edition. Three work groups were created to address 1) essential variables in Section 5, 2) other areas of Section 5, and 3) Section
6. The work groups will aim to meet to discuss results in the mid part of the year. The group examined Section 6.5.5 that uses the term ‘high strength pipe’ with reference to side bends. The group proposed a change to the language to clarify the intent of this section. The group also discussed possible inclusion of a base materials list as a reference for Section 5.

Interpretations Task Group – Tim Burns – see Attachment R. The ITG met prior to the opening session of the main committee meeting, however not all of the subcommittees were represented by a co-chair. The group developed proposed responses to the outstanding requests for interpretations. The proposed responses will be sent to the ITG for concurrence (Action Item 2016-2).

API 1104/5L Joint Work Group – Tim Burns – see Attachment S. The group has decided that further and continued cooperation is required. The group discussed end dimension measurement and specification requirements, however did not come to a resolution. This topic will not be further examined as part of this work group, however efforts will continue. Alex Afaganis is the chair of an API work group (WG 4240) that has proposed new chemical composition requirements (see Attachment T, Attachment U and Attachment V) for line pipe with extremely low carbon content and additions of titanium, vanadium, and niobium. These requirements increase formability for the pipe mills, however they pose a risk to welding because of the increased propensity for HAZ softening. This task group is open to improvements to this proposal. The Chair encouraged those in attendance to please participate in this task group. Alex Afaganis indicated that he will bring the deliverables from the task group before the API 1104 committee for review on the effect of the weldability (Action Item 2016-3). There was discussion about the potential for PRCI to further investigate the effects of the proposed chemical composition requirements on weldability. Yong-Yi Wang indicated that he would provide a relevant report to the API 5L task group (Action Item 2016-4). The idea of further limiting the maximum allowable tensile properties for line pipe in API 5L was also discussed.

2.7. At 4:13 PM, the Chair moved on to the new business portion of the agenda.

Dave Culberson brought up the need for a change to the bylaws regarding appointments and term limits for committee officers. He made a motion for the creation of a task group to examine the bylaws and to make changes as appropriate. Tim Burns seconded this motion, which was approved by unanimous vote (Action Item 2016-5).

Chuck Woodruff asked if the main committee needs to approve the ITG responses. The Chair indicated that he does not believe that the bylaws require that the members of the main committee vote to approve the responses of the ITG. Chuck Woodruff requested that the newly formed task group examine the bylaws to determine if a change is needed (Action Item 2016-6). The Secretary confirmed that there is currently no requirement in the bylaws for the ITG responses to be approved by in the main committee.
Bill Bruce brought forward a concern raised by Bill Amend regarding an interpretation made by the ITG (1104-I-0402-15) on Annex A – see Attachment W. He contends that the interpretation is actually incorrect and needs to be amended. This item could not be addressed during the meeting because the subcommittee co-chairs were not present. The Chair explained that this topic does create some ambiguity and suggested that this item be taken up by the Fracture Mechanics Subcommittee for a potential improvement to the Twenty-second Edition (Action Item 2016-7). Ed Baniak indicated that there is currently no mechanism to change a previously-issued interpretation response. He suggested that a new request for interpretation be submitted to clarify the current interpretation.

The Secretary indicated that many of the subcommittees, task groups, and working groups need an MS Word version of the current edition of the standard (Action Item 2016-8).

The Chair indicated that the time allotment for the 2016 annual meeting, which included three half-day subcommittee sessions, seemed to work well and will be used again for future annual meetings (Action Item 2016-9). He also brought to the floor the need for an editorial task group to examine the changes brought forward for the Twenty-second Edition. This task group should be established later this year.

2.8. A motion to adjourn was made by the Chair at 4:34 PM and Chuck Woodruff seconded the motion. The motion passed unanimously and the meeting was adjourned.

3.0 2016 ACTION ITEMS

Action Item 2016-1 – Tim Burns to work with Ed Baniak to determine which wording in 10.2.3 (‘with’ or ‘without’) was included in the ballot to accept the Twenty-first Edition.

Action Item 2016-2 – Bill Bruce to send the proposed responses to the current outstanding requests for interpretations to the ITG for concurrence.

Action Item 2016-3 – Alex Afaganis to provide deliverables from the API 5L task group to the API 1104 committee for review on the effect of the weldability.

Action Item 2016-4 – Yong-Yi Wang to provide a relevant report to the API 5L task group.

Action Item 2016-5 – Dave Culbertson to form a task group to investigate the need for a change to the bylaws regarding appointments and term limits for committee officers.

Action Item 2016-6 – The aforementioned task group to investigate the need for a change to the bylaws requiring that the main committee approve ITG responses.
Action Item 2016-7 – Fracture Mechanics Subcommittee to evaluate the interpretation made by the ITG on Annex A (1104-I-0402-15) and consider this as a potential improvement for the Twenty-second Edition.

Action Item 2016-8 – Ed Baniak to provide subcommittees, task groups, and working groups a word version of the current edition of the standard, as requested.

Action Item 2016-9 – Tim Burns to work with Ed Baniak to schedule time allotment for the 2017 annual meeting to accommodate three half-day subcommittee sessions.

4.0 ATTACHMENTS

B. Presentation – Improvements to API 1104 for the Twenty-second Edition – Bill Bruce
C. Presentation – Impact of Girth Weld High-low Misalignment – Yong-Yi Wang
D. Presentation - Girth Welds in Newly Constructed Pipelines – Yong-Yi Wang
E. Presentation – DOT PHMSA Report – Gery Bauman
F. Presentation – Alternative Approach to Essential Welding Variables – Marie Quintana
G. Task group report – Annex A Task Group on Installation ECA – Frans Kopp
H. Subcommittee report – Fracture Mechanics – Yong-Yi Wang
I. Subcommittee report – General Interest – Tim Burns
J. Subcommittee report – In-service Welding – Bill Bruce
K. Task group report – Task Group on NDT for Repair and In-Service Welds – Matt Boring
L. Subcommittee report – Mechanized Welding – Bob Huntley
M. Subcommittee report – Nondestructive Testing – Dave Culbertson
N. Task group report – Automatic UT Task Group – Bob Bates
O. Task group report – Radiographic Testing Task Group – Dave Culbertson
P. Subcommittee report – Repair Welding – Alan Beckett
Q. Subcommittee report – Welding Procedures and Welder Qualification – Bill Marhofer
R. Task group report – Interpretations – Tim Burns
S. Task group report – 1104-5L Joint Task Group – Tim Burns
T. Presentation – Proposed Chemical Changes in Spec 5L – Alex Afaganis
U. Document – Proposed changes in Spec 5L Tables – Alex Afaganis
V. Work group report – Meeting Minutes of SC5, WG 4240 – Alex Afaganis
W. Document – Rebuttal to Interpretation No. 1104-I-0402-15 – Bill Amend

Respectfully submitted,
Bill Bruce
Secretary
API-AGA Joint Committee on Oil and Gas Pipeline Field Welding Practices