



**National Institute of
Standards and Technology**
U.S. Department of Commerce

Material Measurement Laboratory
Applied Chemicals and Materials Division
Structural Materials Group

Meeting Minutes: DOT/PHMSA Steering Committee Update Meeting

Project Title: Characterization of Modern High Toughness Steels for Fracture Propagation and Arrest Assessment	Date: 27 May 2015
	Room(s): WebEx
	Host: Dash Weeks
	Internal Project: DOT/PHMSA Task Order 1
	Contract: DTPH56-13-X-000013
	DOT Sponsor: James Merritt

Attendees:

Name	Organization	Contact
Jim Merritt	DOT	James.merritt@dot.gov
Dash Weeks	NIST	timdash@nist.gov
Dave McColskey	NIST	j.mccolskey@nist.gov
Nick Barbosa	NIST	nicholas.barbosa@nist.gov
Robert Amaro	Colorado School of Mines/NIST	Robert.amaro@nist.gov
David Johnson	Paragon Industries / AIST	david.johnson@paragonindinc.com
Su Xu	CanmetMATERIALS	Su.Xu@NRCan-RNCan.gc.ca
Brian Rothwell	Brian Rothwell Consulting Inc./PRCI	brian.rothwell@shaw.ca
Kip Findley	Colorado School of Mines	kfindley@mines.edu
David Horsley	Horsley Consulting	David@horsleyconsulting.com

Agenda:

1.	12:50 PM (MDT)	Connect to WebEx and Dial-in
2.	1:00 PM	Attendee Roll Call
3.	1:05 PM	Old Business
4.	1:30 PM	Project Progress to date
5.	1:45 PM	Next Steps - Discussion
6.	2:30 PM	Adjourn

Slide 1 – Welcome back to virtual Boulder – Steering Committee Update Meeting

Slide 2 – Agenda of the meeting

Jim Merritt provided an updated to DOT/PHMSA activities. Currently down-selecting proposals from the recent Research Announcement. CAP reviews are complete for the graduate program and DOT/PHMSA received a funding increase for that program. Jim reiterated DOT/PHMSA intent to extend the scope, time and funding for this project for model validation from experiments.

Slide 3 – Old Business – Project Outreach

- Dash presented some details surrounding the ASPPRC meeting in March
 - Invited talk for project overview
- Dash presented some details surrounding the ICPLP conference in April
 - Invited talk for project overview
 - Solicited collaborations and material sources
 - Toured TGRI facility and met with potential collaborators to discuss material needs

Jim Merritt asked if the collaborative agreement would include obtaining material data or if that data will be generated here. Dash responded that the goal will be to have TGRI do small scale testing in parallel with the needs of this project, it isn't likely that they will be able to or willing to perform the mini-tensile and compression testing. TGRI will be given the detailed drawings for the small scale specimens and TGRI prefers to send specimens, opposed to raw plate materials. Jim added that we should capture the costs associated with services and materials provided to be counted as cost share to bolster support for the project. Dash mentioned that NIST was in the process of evaluating the best collaborative mechanism and Nick Barbosa commented that there is Dept. of State sensitivity with any projects involving Chinese organizations. Jim agreed and mentioned some successful agreements with DOT and cited that it was still positive that we were looking to leverage work anywhere possible.

Slide 4 – Old Business – Material Sources

- Presented the status of previous contacts made at the API meeting
- Collaboration with EPRG is still pending
- Obtained X80 material from JFE Steel
- Obtained X70 material from ArcelorMittal

Slide 5 – Project Progress - Testing

- Updated the group on the status of fixture and specimen machining
- A36 Small scale specimens are in route to NIST
- A36 Pre-straining specimen in fabrication and will ship immediately

Brian Rothwell asked about platen lubrication for the compression testing. Brian has extensive experience with compression testing and wanted to ensure that we considered it. Dash described the method of loading, constraint effects and cited requirements of ASTM E9. Added that Bill Luecke at NIST – Gaithersburg is the task group for ASTM E9 and that we conferred with him regarding test methods and measurement requirements. Details of the measurements were questioned with respect to axial or diametral extensometers – we will be using axial extensometers that are

diametrically opposed. Dash discussed the option of alternatively using 3D DIC but that the analysis and post processing of data is very time consuming compared to traditional instrumentation. Brian Rothwell asked about using 3D DIC vs. planar orthogonal views – both are possible but the 3D data would be most useful. In a private meeting with Dave McColskey after the update meeting, Dave mentioned that strain gaging the compression cylinders would be possible without interfering with the extensometer measurements and would provide additional data to verify the method.

Kip Findley inquired about the anticipated pre-strain level for the large plate. Robert mentioned that the goal is to get as near UTS as possible but that incipient necking could present a problem. Dash added that even if necking were to occur at some part of the plate, we will have the full field DIC data to know the pre-strain levels away from the necking area and that the small scale specimens would be taken from areas with as uniform a strain gradient as possible.

Su Xu recommended that we compare the compression and mini-tensile data and it was agreed that the purpose of the mini-tensile tests would be to correlate to the compression data and hopefully eliminate the need for compression data. By comparing the first few percent strain, we'll know whether the data will be comparable.

Slide 6 – Project Progress - Modelling

- Constitutive model still awaits small scale test results
- CSM student completed some analysis on full test geometry with focus on notch guarding
- Updated the group on post-doc opportunities

Brian Rothwell commented on previous AISI and CSM full scale tests and that we should seek to find the results. Dash mentioned that Brian Leis has provided an extensive list of references and we believe the results of those tests are among them but that needs to be verified.

Jim Merritt asked when we expect to have results from the modelling effort. Dash indicated that those results are dependent on the small scale test results. Robert Amaro added that he would need approximately 8-10 weeks for calibration and implementation for the next step. But he cautioned that the effort may be iterative with more physical testing so an exact time line was difficult to anticipate at this point. Jim added that his inquiry was related to setting the next meeting date and that we should be able to show progress with actual data. That is indeed the goal. Testing is anticipated to begin the first week of June.

Slide 7 – Next Steps - Discussion

- No significant change to the status of small scale tests and model calibration and these remain the top priority for the project.

Slide 8 – Adjourn

Propose next meeting July 27, 2015 1:00 – 2:30 PM MDT