Applied Chemicals and Materials Division

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Welcome back to Virtual Boulder!

Characterization of Modern High Toughness Steels for Fracture Propagation and Arrest Assessment

Steering Committee Meeting – May 27, 2014

AGENDA

1.	**12:50 PM**	**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

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Old Business – Project Outreach

- Project Presentation at ASPPRC (Golden, CO)
  - Semi-Annual Review Meeting in March
  - Invited talk – Overview of NIST Pipeline Project
  - Focus on this project and solicitation for material
  - ASPPRC research compliments project well
  - Strong potential for future collaborations
- Project Presentation at ICPLP (Xi'an China)
  - Invited talk – Overview of NIST Pipeline Project
  - Focus on this project and solicitation for material
  - Tour of TGRI facility
  - Meetings with TGRI officials for collaboration and material source
    - Working out details of CRADA
    - TGRI will provide specimens from X70 & X80 plate
  - Meetings with International Fracture Consortia members
    - Known gap in structure property relationships w.r.t. texture

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Old Business – Material Sources

- Contact Follow up from API Meeting
  - Marion Erdelen-Peppler - Saltzgitter
    - Still communicating with Marion re: collaboration and materials
    - Still needs approval to share project details
  - Joe Kondo & Satoshi Igi – JFE Steel
    - Sending 17.5 mm X80 plate (4 plates ~ 1 m^2)
    - Still working on international shipping details
  - Martin France – ArcelorMittal
    - 16.5 mm X70 Plate (4 plates 24X32 in) at NIST
    - Awaiting management approval to publish data with source association
  - Several other people are independently working on additional sources
  - Opened up the search to X70 – X90 to obtain thinner material for the intermediate tests.

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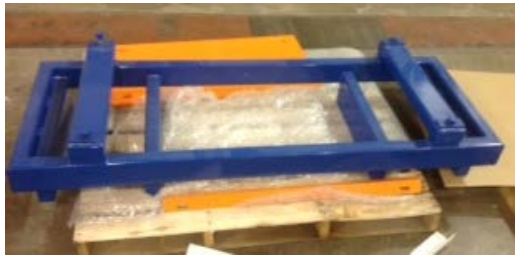
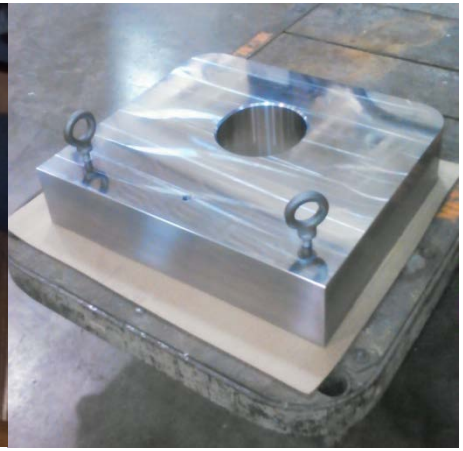
Project Progress - Testing

– Perform the required small scale specimen tests for model calibration – In progress

- Small Scale Specimen Machining Complete
  - Shipped to NIST-Boulder 5/26



- Pre-strain Specimen Welded 5/27
- Mini-tensile fixtures complete
- Compression sub-press still in procurement process
- Custom extensometers in-hand



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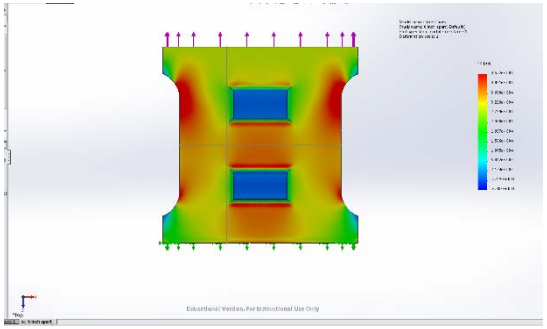
Project Progress - Modelling

– Calibrate the constitutive model – Awaiting Data

– CSM Student iterated designs and analysis to determine best notch guarding method



- Need to remove guarding from the specimen surface
- Concept designs are being considered to guard the entire specimen

– NIST posted an NRC post-doc position – focus on modelling
  - Several candidates contacted us and we are meeting with them for the August proposal deadline, selected candidate will work on multiple elasto-plastic fracture problems
  - Desire candidate with strong mechanics and plasticity background
    – Future work in filling the gap identified by International Fracture Consortium to determine structure property relationships with respect to texture and plastic deformation
    – Current NRC post-doc uses Neutron/X-Ray beam to study lattice deformation – can be used for texture

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Next Steps – Discussion

- Perform the required small scale specimen tests for model calibration
- Calibrate the constitutive model

Couple the constitutive model results with FEA to optimize the intermediate test specimen design

- Manufacture specimens and begin testing

Adjourn

- Thank You for your time!
- Propose next meeting
  - July 29th 1:00 – 2:30 PM MDT

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