Spring 19 SAE FD&E Meeting – Cobo Center

Attendees:



FD&E Meeting Presentations Location:

<http://www.fatigue.org/meeting-archive/previous-meeting-agendas-minutes-and-presentations-2012-current/spring-2019-detroit-mi/>

Meeting Minutes:

1. Residual Stress Measurement Results- Taylor Thompson
   * Proto preformed many XRD measurements on the T-sample we sent them
   * They did depth measurements and along a vertical path from the weldtoe
   * Their data has some agreement with the Hill contour and American Stress Tech XRD
   * There is a lot of data to compare to, see PPT for more details
   * Suggested improvements in the D0 could help improve APS and NIST measurements
2. Residual Stress Effect from Cyclic Loading on Shot Peened Powder-Forged Copper Steel- Al Conle/Russ Chernenkoff
   * Al reviewed Russ’s presentation about residual stress change over time for shot peened parts
3. Residual Stress Relaxation- Al Conle
   * Al presented on mean stress effects on fatigue testing results
4. Fuchs Award Recipient Presentation- Jonathan Pegues
   * Jonathan presented on Additive Manufacturing of Fatigue Resistant Materials by Establishing Structure-Property Relationships
5. The Influence of Monotonic Damage on Metal Fatigue at High Stress-Ratios - Dr. Peter Huffman
   * Peter presented to us on the effects of the first monatomic load a specimen experiences
6. Fatigue Net – Suraj Nikam (Western Michigan University)
   * Suraj presented to us Fatigue.net
   * Online fatigue tool that serves as a bridge between academia and industry
   * <http://fatiguenet.com/> (Chrome Only)
     + User and password: Kujawski
7. Total Life Documentation- All
   * Primary focus was to get the presentations complete
     + The presentations will be located here;

<http://www.fatigue.org/projects/total-life-project/total-life-at-sae-wcx/>

* + Discussed 2 main options, a 3rd (last) is also available
    - Paper Compilation (available print and online eBook)
      * A Paper Compilation pulls in 10 previous published technical papers into one book. The book would include an introduction as well as epilogue. The original content should frame the papers into one theme. If necessary, we could pull less than 10 papers and adjust price as appropriate.
    - Traditional Book (available print and online eBook)
      * A traditional book includes a preface, introduction, and chapters. Papers would be need to be reconfigured to fit within the SAE chapter format. This format includes chapter opening paragraph, chapter opening bullets, chapter topics with level 1 and level 2 sections, figures, summary paragraph and summary bullets.
    - Conference Paper Collection (available print and online eBook)
      * This option would include only papers submitted to a conference. This is an automated process with no editorial touchpoint. There is no opportunity to add an introduction or supplementary content.
  + **We need a final decision on this in Fall 19 (or earlier).**

1. Project Discussion- What our next project should be/consider
   * **Needs** to be important to our companies
   * What is the scale of the next project? 1, 5, 10 years?
   * Needs a leader/driver
   * Needs to include and be relevant to all companies; Hendrickson, Emerson, CAT, Deere, MTS, Ford, HBM, Liebherr, ORNL, Academia, etc.
   * **Cannot** be proprietary information/processes
   * Should put together info/tools to use to solicit support (time and money) from our companies and contributors
   * Consider what has FD&E done in the past for projects
2. Next Project Proposal Topic Considerations
   * Knowledge retention and documenting
   * Residual Stress Changes with Life Fractions- Al Conle
     + Residual stresses can be changed due to plasticity during fatigue cycling. It would be helpful to our engineering knowledge to understand if this is occurring in the FD+E Total life welded specimens. It is proposed that surface residual stresses be measured before and during cycling. The first test should be at a high stresses level to decide if a lower stress level test is needed.
   * Loads Development and Customer Usage Understanding- Dan Lingenfelser
   * Small Weld and/or Laser Welding- Dave Strei (Emerson)
     + Fatigue of very small welds on small parts/plates
   * AM parts surface correction factors- Jonathan Pegues/ Hayley Brown
   * Update Fatigue Design Handbook
     + SAE sells these books, and has asked for an update
   * Publish the Total Life data/papers in on location
     + Make it more available to the public
   * Do more Total Life Testing; VA, compressive mean, etc.
   * Weight Function development with a 2D residual stress consideration- Dr. Glinka
     + Further development of the Total Life “engine”
   * Multi Load Distribution causing a multi Stress Distribution- Dr. Glinka
     + Further development of the Total Life “engine”

**This topic also need immediate action. Please discuss this at your company and be prepared to make decisions and contributions to the next steps of the FD&E group.**

1. Next Meeting
   * The next meeting will likely be at TEC in Knoxville, TN
   * The month of the meeting will probably be October, but the date is not set
2. Management Announcement
   * At this time, I have decided to retire as the Chair of the FD&E committee. I want to thank everyone for the help and support of the FD&E committee over the past 5 years. I will continue with the committee and the Residual Stress Committee. I look forward to our upcoming direction and know that Jim and Hayley will do a great job running the FD&E community.