



## ISWP Standards Working Group

### July 19, 2016 Standards Working Group (SWG) Meeting Recap

The ISWP Standards Working Group met by conference call on Tuesday, July 19, 2016 from 12:00 p.m. to 1:30 p.m. U.S. Eastern Time. This document provides objectives and a recap.

#### Objectives

1. Discuss progress updates from the subgroups and related future work.
2. Funding Request discussion.

#### Discussion

1. Rolling resistance testing:
  - a. Testing for change in rolling resistance over time can be one of the prepositive tests for the RRT.
  - b. It was suggested that different wheels should be tested with different parameters - Toe in, toe out, bearing wear, tire type, inflation level.
  - c. Students from the senior design class will be working on further development and testing with RRT this fall. It was noted that having a part-time student working on RRT would be helpful.
  - d. Outline for development paper for the RRT was presented.
2. Caster Testing
  - a. Testing Completed for
    - i. Grey caster from one of the manufacturers completed 100K cycles with angled slats. This caster underwent angular hits.
    - ii. Black caster suffered a crack in the base of the stem bolt after 35K cycles. This caster underwent straight shocks.
    - iii. Chakra testing results:  
<https://docs.google.com/spreadsheets/d/1mzMYOZimukbR2RjzoxIH8z2TDTY6uxCEk8mZ7otcYI0/edit?usp=sharing>
  - b. Testing Scheduled
    - i. Study using casters from five manufacturers with straight (0°) versus angled slats (15° and 30°). Testing the casters until Class III failure.
      1. Matt M can provide casters from CITE chairs.
  - c. Mechanical developments
    - i. Designed and fabricated stem bearing housings.



- ii. Designing new pie pieces for slat adjustment required for scheduled testing.
    - iii. Installed polyurethane casters.
    - iv. New 8020 caster assembly holding arm is being designed and fabricated.
      - 1. Verified slippage with 10K cycles.
      - 2. Fabricating a new arm that is rigid.
    - v. Designed holders for a polycarbonate protection shield.
  - d. The team received casters from Shonaquip and will be fabricating a caster stem bearing housing for the design.
  - e. Norm has sent acceleration data to Anand with testing from 3 chairs for over 10-day period.
  - f. Developing a caster failure checklist for evaluating failures.
  - g. Dan to provide drawings to Anand for the caster hub.
3. Corrosion Testing:
- a. Corrosion chamber has arrived at Pitt. Installation will begin in a couple of weeks.
  - b. Anand has built a base for mounting the chamber and needs verification from the installation company.
  - c. ISWP and the standards group is greatly thankful to LDS for donation for installation of the salt fog chamber at Pitt.
4. Whole Chair Testing:
- a. Don has drafted materials for funding proposition to potential funders and donors.
  - b. Links: <https://drive.google.com/file/d/0B3o-KpFV8x-8bj11NVNITkJNSVk/view?usp=sharing>
  - c. <https://drive.google.com/file/d/0B3o-KpFV8x-8R3k1WUItbEpNY3c/view?usp=sharing>
5. Design Guidelines:
- a. Sections on procurement, delivery and testing needs some efforts from the team.
  - b. The team is planning to complete the draft by Nov.1 for review by a panel consisting of:
    - i. Elsje Scheffler (clinical)
    - ii. Mark Richards



- iii. Stefan
    - iv. Ralph Hotchkiss
    - v. Jamie Noon (clinical)
    - vi. Rory Cooper (alternate reviewer if someone declines)
    - vii. Eliza (alternate reviewer if someone declines)
  - c. Additional Reviewers nominated:
    - i. Wayne Hanson, ROC Wheels
    - ii. Gregor
    - iii. Keoke King, UCP
    - iv. Ray Mines, Motivation
    - v. Amos Winter, MIT
    - vi. Dan Frye, MIT
  - d. Feedback from the reviewers can be discussed in the group and responses and disagreements to this feedback can be negotiated during an in-person group meeting.
  - e. The group considers holding the in-person meeting this year in California with hosting by Free Wheelchair Mission during the week of December 12.
    - i. One and half day for design guidelines review
    - ii. One and half day for sub-group discussions
  - f. For initial review, the group would like credit reviewers by
    - i. Honorariums
    - ii. Compensating the reviewer for their time and effort for the review (may do a \$5k funding request for this - \$300/day for 5 reviewers).
  - g. The group estimates publishing the guidelines in January.
6. Funding proposals are due Friday, August 19 before August 25 Board call.
7. Jon will be attending the ISO meeting and proposing ISWP standards to be added to ISO 7176 or requesting including a technical note in 7176 that refers to ISWP standards as additional standards for products in LRCs.
8. Expectations from group as per ISWP plan
  - a. Casters and wheels from 5 manufactures to be tested with the Chakra and RRT respectively.
  - b. Design Guidelines to be published and wheelchairs to be reviewed using a checklist that could assist manufacturers and governments in decision making.



## Subgroups (for reference)

- Design Guidelines: Mark Sullivan (lead), Daniel Martin, Jon Pearlman, Norman Reese, Chris Rushman, Eric Wunderlich
- Casters: Anand Mhatre (lead), Matt McCambridge, Jon Pearlman, Norman Reese, Don Schoendorfer
- Corrosion: Matt McCambridge, Don Schoendorfer, Anand Mhatre, Jon Pearlman
- Rolling Resistance: Norman Reese (lead), Matt McCambridge, Jon Pearlman
- Whole Chair Testing: Don Schoendorfer, Matt McCambridge, Josiah Auer, Mark Sullivan, Daniel Martin, Jon Pearlman, Norman Reese, Anand Mhatre, Dave Mahilo

## Participants

- ✓ Daniel Martin, Shonaquip
- ✓ Matt McCambridge: DEKA (formerly with Whirlwind)
- ✓ Norman Reese, LeTourneau University  
Caleb Elder, LeTourneau University  
Karen Rispin, LeTourneau University
- ✓ Mark Sullivan, Convaid and Polus Center (WG Chair)  
Don Schoendorfer, Free Wheelchair Mission  
Karl-Erik Westman, Handicap International
- ✓ Eric Wunderlich, LDS Church  
Chris Rushman, Motivation  
Dave Mahilo, Invacare  
Dr. Rory Cooper, University of Pittsburgh
- ✓ Anand Mhatre, University of Pittsburgh
- ✓ Dr. Jonathan Pearlman, University of Pittsburgh
- ✓ Nancy Augustine, University of Pittsburgh  
Ben Gebrosky, University of Pittsburgh  
Josiah Auer, Free Wheelchair Mission  
Kirthika Kandavel, ISWP

Prepared by: Anand Mhatre, University of Pittsburgh