

EWLSE Updates

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We welcomed over 50 attendees to our Empowering Women Leaders in Systems Engineering (EWLSE) working, outreach, and networking sessions at the INCOSE International Workshop (IW) 2020. As an opening to our working session, Erika Palmer and Maja Farstad (see separate article) led an icebreaker exercise “Working Together to Identify Gender Issues in Systems Engineering.” This preceded presentations from several INCOSE Insight “Diversity in Systems Engineering” (see [Figure 1](#)) authors. First, Alan Harding and Andy Pickard summarized their “Towards a more Diverse INCOSE” article which covers gender balance across INCOSE leadership, events, awards and compares INCOSE to IEEE and IET in certain aspects. Bottom line findings included INCOSE’s gender balance in membership, certification, and INCOSE IW and IS attendance, and a need to achieve balance in other areas such as Pioneer and Fellow awards and technical operations leadership. INCOSE commissioned a task team to pursue recommendations presented by the authors to lead the way in building a diverse membership to advance and promote systems engineering. Next, Omar El-Haloush and David Flanigan summarized their “INCOSE Practitioners Challenge 2019: Clean Water and Sanitation in the Ganges River Basin” article. The exercise included identifying a layer of problems or considerations from the household to the local community to the systems of systems including the Ganges watershed, politics, and religion. Themes from the IS 2019 conference inspiring the team included building communities, biomimicry, subjective frameworks and integral theory, influencing without authority, and system of systems. The team applied standard systems engineering approaches considering socio-technical systems and human system interactions. Courtney Wright concluded the article summaries with her “Globalizing the Certification of Systems Engineers” article which focused on the use of paper exams, automated certificates, and academic equivalency agreements with universities to support international testing, distribution of certificates, and expanding



Figure 1. INCOSE Insight “Diversity in Systems Engineering” with Wiley open access through March 2020.

equivalency for the certification exam beyond the English speaking requirement.

We also had a guest visit from Patrick Godfrey from the INCOSE Technical Leadership Institute. Patrick shared insightful and heartfelt stories about how he developed a transdisciplinary respect for diversity, from coaching his younger sisters (and their friends) in Math and physics to learning about Fourier transforms and quantum physics from his wife and on-the-job experiences. He continues to support women and men in engineering and architecting with recent classes from Chongqing, China involving a majority of women (55% and 57%). For those interested in applying to the INCOSE Technical Leadership Institute, please contact David.long@vitechcorp.com; this year’s deadline for applicants is March 31st.

Next, we held our outreach session where Marilyn Pineda and Alice Squires facilitated

training “Negotiating and Influencing” using real-life case scenarios from their personal experience (see separate article). We ended the day with a networking session where INCOSE leaders and EWLSE members met and mingled while discussing the session outcomes, the benefits of participating in the INCOSE Technical Leadership Institute, and establishing a ‘Diversity’ cross cutting category for INCOSE IS papers, presentations, and tutorials, among other topics.

All files presented or related to the INCOSE IW 2020 EWLSE sessions are accessible for a limited time at this url: <https://www.dropbox.com/sh/3vd4cq0xwkb3byk/AAC6rXIVV-R-8v17-ydsZt7Ba?dl=0>.

Working Together to Identify Gender Issues in Systems Engineering

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To open the EWLSE working session, Erika Palmer and Maja Farstad led an icebreaker exercise “Working Together to Identify Gender Issues in Systems Engineering.” They gave a brief introduction to their paper: “It’s Not Just Counting the Women: Gender Diversity and Systems Engineering” (accepted to the INCOSE IS 2020 for presentation) to conceptually outline gender issue basics in systems engineering practice. Before starting the exercise portion, they also showed a video from the non-profit organization Plan International, on society’s unintended negative consequences of women being excluded from design considerations. Several examples of products with inherit

gender issues included a world where a woman is 47% more likely to be seriously injured in a car wreck (especially when petite male crash test dummies are used to model women) and yet emergency systems are 70% better at understanding a male voice, where women are excluded from medical testing due to the complications of female hormones, and female security personnel are not adequately protected by body armor vests designed for male chest sizes.

Erika and Maja then had everyone break into four groups, where each group drew a life cycle of a product and discussed and identified gender issues in each of the life cycle stages. One group, as reported by Molly Kovaka, addressed climbing safety harnesses. Focusing on the utility application of a safety harness, Molly reported her group (comprised of two men and two women) determined, owing to differences in physiology, systems designed for men who were typically heavier, taller, and had a different center of mass than women, would influence how a user would experience an arrested fall, and also the harnesses’ impact comfort and usability. These factors are illustrated in Figure 2. Another group, as reported on by Nickolas Guertin, addressed a sled design (a big wheeled wagon) where his Girl’s BSA troop was participating in a scouting event for boys and girls, and needed to push and pull the sled over hilly terrain on a course, and stop at “towns” to demonstrate their scouting skills. As a result of this exercise, Nickolas took input back from his INCOSE team to his troop and they designed durable and lightweight equipment to complete their

Use Context: Utility Tower

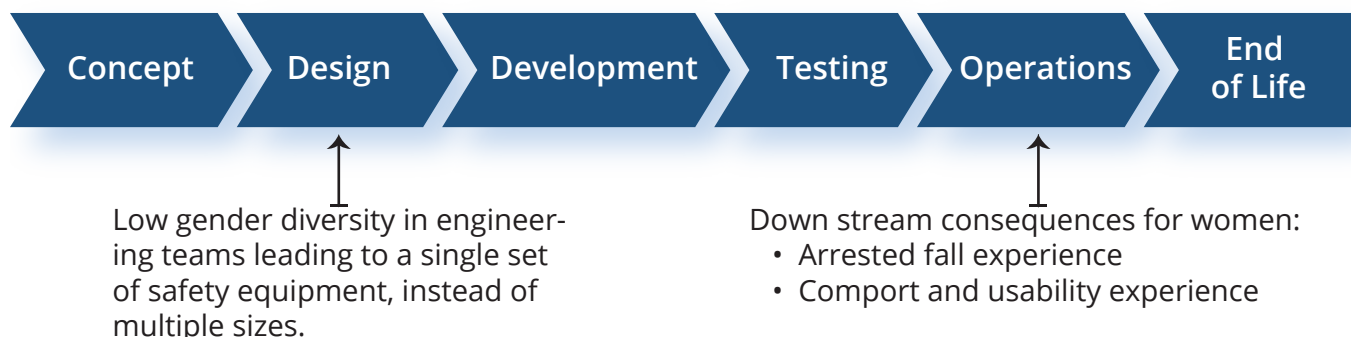


Figure 2: Group One’s Product Example: Climbing Safety Harnesses

tasks and performed well in the competition. Another design in the session included a mobile phone. There were lively discussions throughout the exercise about identifying gender issues, focusing on product design. At the end of the exercise, each group presented one key discussion point. Takeaways from the participants included the need for participants championing women, to considering allowing women to take the lead as part of their advocacy, and the power of teamwork in identifying these key product design issues for all users.

Negotiation and Influencing—with Real-Life Case Scenarios

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Based on requests from INCOSE membership, the EWLSE outreach session volunteered to provide training on “Negotiation and Influencing” with real-life case scenarios. First, attendees shared a memorable negotiation experience. Negative outcomes had these characteristics:

- Taking too long to make a decision (especially when it comes to cyber security)
- The other party feigning agreement and then doing nothing
- Making a person feel less worthy to get one’s way
- Being expected to be quiet and compliant or otherwise viewed negatively
- Being passive and allowing the situation to dictate the outcome
- Focusing on the conflict

Positive outcomes were supported by the following:

- Getting over the hurdle of ‘whose fault is it’
- Standing ground (not being intimidated or made to feel unworthy)
- Showing how the outcome benefits the other parties involved
- Focusing on the shared goal to support diversity and inclusiveness

- Putting safety first
- Bringing in an outside perspective
- Persistence, not giving up when thrown a curve ball

Next the participants divided into four groups and each group went through a real-life case scenario. The case scenarios involved an openly hostile interviewer, a hiring situation involving a candidate unlike anyone else in the department, a new female engineering manager shown the way to her new...cubicle instead of office, and troubleshooting a problem not on my board! The groups were assigned to respond with the major conflict, what needed to be negotiated, who was involved, what were some common goals, how might agreement be achieved, and last but not least, how does the confident leader react in these situations? Overall recommendations were dependent on the case scenarios but generally focused on realizing when you are in a negotiation, agreeing on the shared common ground first and then negotiating, using “power with” (power from others), being proactive (not passive), mirroring (repeating what the other person said) while also refuting false statements, assuming the other party’s positive interpretations and intentions, providing a reason for your proposal first and then making the proposal, and finding and receiving input from a neutral third party. Overall the training was well received. Please send requests for future training to ewlse@incose.org.

Ready to be a Systems Engineering Mentor or Mentee?

Looking for a systems engineering mentor or ready to be a systems engineering mentee or both? Please sign up here:

<https://bit.ly/2G6TJPL>

