

Agenda – November 26, 2018
Group 9 (College of Engineering) Health and Safety Committee

1. Attending

Eliot George for Fiona Spencer, AA
Colleen Irvin, BioE
Summer Dela Cruz for Sean Yeung, CEE
Michael Pomfret, CEI
Kameron Harmon, ChemE
S. Honeydew or M. Glidden, CoE DO
Sophie Ostlund, CSE
John Young, EE

Angie Haggard, EH&S
Stacia Green, HCDE
Sheila Prusa, ISE
Bill Kuykendall, ME
Chris Adams, MoES/NanoES
Tatyana Galenko, MSE
Michael Khbeis and Darick Baker, WNF

2. Introduction: Darick Baker taking over for Michael Khbeis, WNF

3. Video: Bystander Intervention

4. Previous Meeting Minutes

- Oct 2018 – approve? Corrections?
- Previous meeting minutes are posted at <https://www.engr.washington.edu/mycoe/safety#>

5. Department Incident Reports

- CEE @ HUB – bruised from slip/trip caused by water on floor (Oct) Note: will also be reviewed by Group 3.
- WNF @ Fluke – possible skin reaction/burn from stain on freshly laundered clean room suit (Oct)
- Dean's Office @ Dabble Lab, Maple – cut finger on edge of glass (Oct)
- AA @ AERB/lot C17 – near miss when aluminum tank failed pressure test (Oct)

6. Group Business

- Slips, Trips, and Falls (STF) Incident Checklist
- Crime Prevention Through Environmental Design (CPTED) Security Assessment
- Group 9 annual review of charter
- Group 9 annual review of UW APP

7. UW-Wide Meeting

- Oct minutes attached
- Nov agenda attached. Highlights:
 - 2018 Workers Comp report (PPT on Claims Services website)
 - UW Worker's Comp premium, calculated on a rolling 3-year average, is currently \$23 million/yr. We have been trending to lower claim severity (time loss days down 18% in last four years) and cost (8% less in time loss payments over that time), but our expense modifier will likely go up next year. Highly encourage return-to-work efforts and focus on safety in the first place.
 - Only five U.S. states have our kind of insurance setup; the rest have a broker, select a company to cover employees. WA has some of most generous benefits, but only in WA do employees put money into workers comp – about 10 cents per hour.

- If you have an injured worker, do OARS report and then keep communicating with them, HR, and Claims Services. Look for duty opportunities before they are needed, so you have a list of options in mind. Welcome back employees and accommodate where possible. The stay-at-work reimbursement program has paid out 1.3 million since 2012. That is money to departments by claims services administrators.
- If someone is out for 4-6 weeks they have 20% chance of never returning to work. 6 months = 50%. Peer and supervisor support is highly needed right after an injury. Training is available for supervisors and managers, on how to avoid and deal with claims.
- Group Reports
 - Group 1 talked to CoMotion about 3D printers and ethical dilemmas re: printing weapons/pieces. Will recommend President's office issue Exec Order.
 - Group 2 – FS partnered with EH&S on HuskyPaws campaign. Steps on card to stop and think before act, to prevent harm.
 - Group 5 will do own Stop The Bleed presentation.
 - Group 10 College of Environment applied to grow pot for medical research.
 - EH&S – See new [Youth Safety tool](#) on website. Root cause tools and templates added to Accident Prevention page. There will be a new Fall Protection page.
 - UWEM – Eli King last day tomorrow (will hire). Special Events Planning back on track – formal LEAN process in 2019.
 - Identify your group's best efforts/initiatives to bring to December U-wide meeting.

8. Department Updates

Next Meeting: due to holidays, December meeting postponed to January 7th at 3pm, in Loew 355

DRAFT Meeting Minutes

Health and Safety Committee for Group 9 (College of Engineering)

Meeting Date: Oct 29, 2018

Attended

Eliot George for Fiona Spencer, AA
Kameron Harmon, ChemE
J. Sean Yeung, CEE
Kristine Parra for Michael Pomfret, CEI
Sonia Honeydew, DO
John Young, EE
Angie Haggard, EH&S

Jane Skau for Stacia Green, HCDE
Sheila Prusa, ISE
Bill Kuykendall, ME
Chris Adams, MoIES/NanoES
Tatyana Galenko, MSE
Michael Khbeis, WNF

Absent

Colleen Irvin, BioE
Sophie Ostlund, CSE

Guest Speaker: Erin McKeown of EH&S on Chemical Spills

- Preparedness: Hazard recognition starts with appropriate training; all staff should take general class "Managing Laboratory Chemicals" to recognize hazards and appropriate ways to control them, then supplement with specific training appropriate to chemicals expected. Those who work with chemicals are expected to know their SOPs (it's the law). Cleanup supplies and PPE should match onsite hazards; eProcurement sells a generic chemical spill kit produced by VWR for UW, with 5 universal spill pads. Mercury thermometer spill kit is separate.
- In the event: If people are endangered (e.g. breathing fumes) or there may be a fire, activate evacuation alarm and call 911 to explain the situation, then provide SDS/MyChem (first responders should have access to UW's chemical inventory system, MyChem, but for efficiency you should be prepared to provide SDS). Eye washes and safety shower duration should be at least 15 minutes. Help responders locate injured people. Injured people should go to ER, not Hall Health. For *non-emergency* spills, during business hours call EH&S spill line for advice (543-0467); after business hours call UWPD non-emergency (685-UWPD). It is more likely something you can address yourself if it is within a fume hood, and some releases can be resolved by clearing the room until evaporation complete. 24/7 EH&S can get contractor help for spill cleanup.
- After event: Schedule *follow-up* exposure assessments through Employee Health Center or your doctor afterwards. Submit OARS reports.

DRAFT Meeting Minutes

Health and Safety Committee for Group 9 (College of Engineering)

- Common mistakes: items not entered into MyChem inventory, e.g. engine oil, batteries, aerosol cans, PCB ballast, hydraulic/cutting oil, lubricants, gas cylinders. Occupants don't call 911 when people are endangered. Exposed persons use sink rather than emergency shower, not realizing spread of splash to other parts of body. Injured persons go to Hall Health (not equipped) for initial assessment, or walk to the ER when they should get a ride. OARS report not done. Chemicals from clean-up thrown in trash.
- Erin's "Hazardous Material Spill or Release" 10-minute presentation notes added to group drive.
- See "Wastewater, Stormwater, Trash, and Other Common Waste" page in [Managing Laboratory Chemicals online training](#).

Previous Meeting Minutes

- Sep 2018 – draft approved
- Previous meeting minutes are at: <https://www.engr.washington.edu/mycoe/safety#>

Incident Reports

- WNF @ Fluke – near miss acid-base reaction in fume hood by non-academic affiliate (Sep). HCl rather than H₂O₂ added, reaction sucked away by fume hood. Group 9 practiced "5 Whys Root Cause Analysis" and shared OSHA Incident Investigation Guide for Employers Appendices E&F. Container labels were normal but HCl was stored near H₂O₂. Sticker idea. Unusual to have acids and bases together in one bench, but they were stored this way due to sequence there. Idea: add physical barrier between acids and bases on that shelf? Or order chemicals from left to right according to pH? In general, longtime users need to remain vigilant; remind employees work-life balance is important to remain alert for dangerous work. Employees also need to know they have permission to not hurry, to proceed safely. Training reminders.
- AA @ Kirsten Wind Tunnel – non-Facilities employees inappropriately demolished internal walls and were exposed to lead paint (Sep). UW Recycling picked up waste (truck subsequently decontaminated). EH&S tested for asbestos (none) and lead (some found in some old paint that was disturbed). Lab generated list of all persons potentially exposed. Two student employees advised and blood tests for lead recommended. All other building employees alerted to potential exposure. Building visitors from that time period will be informed.

DRAFT Meeting Minutes

Health and Safety Committee for Group 9 (College of Engineering)

AA follow-up questions for Nov: has decontamination of equipment in room and foyer been completed? Has department completed all formal notifications? Is Building Coordinator/PI now current on training? Additional thoughts from Group 9: Is our current asbestos training requirement (once only) sufficient for long-term employees, e.g. 27-year employees? Wouldn't the threat of union legal grievance be a deterrent to such inappropriate facilities work by employees? Note: 2/26/18 Facilities reminder email specifying that Facilities do facilities work is now on group drive in case anyone needs a copy to educate their group. Also noted: Asbestos General Awareness training required for all employees; Lead Awareness training requirements depend upon type of work. Also noted: metallic lead (paint?) must now be listed in MyChem.

- ChemE – cut fingers with cryostat blade while cleaning eqpt (Sep). Out of practice and forgot step in protocol to take out razor blade when cleaning cryostat equipment. Also forgot to put blade guard on. This happens about once a year in the department. There is signage reminding users of sharps hazard – could signage be improved? Should this work be limited to only grad students, not undergrads? Should this work be done only with a buddy (four eyes better than two)? Chris of MoIES/NanoES has another piece of eqpt, a microtome tool with guards, that could be borrowed... Kameron will tell PI.

Group Business

- We will practice the 5 Whys Root Cause Analysis (on shared drive) on one OARS report/month.
- Note the annual message on UW emergency alerts and communications (on shared drive).
- Adrian Santos of EH&S asked whether we'd like CoE building evacuation drills in the Spring or Fall quarter of 2019, now that we want to level up from summer (less occupied) drills. We voted for Autumn.
- APP recommendation: more comprehensive training that affects all employees – Managing Lab Chemicals, GHS, MyChem.
- Group 9 recommends (yet again) a U-wide learning management system that is one place to track all training. Chris can tell Denise about the one at SLU. UW Transp looking at Bridge. WorkDay training module not purchased by UW.

UW-Wide Meeting

- Sep minutes in packet.

DRAFT Meeting Minutes

Health and Safety Committee for Group 9 (College of Engineering)

- Oct agenda attached. Highlights:
 - October is National BioSafety Month for research labs. 1,813 of 4,100 UW research labs work with biohazards; 610 currently have BUAs. 2018 theme of biosafety month is “culture of safety”.
 - Next level to improve culture of safety at UW is to be more proactive. Educate your leadership. Promote biosafety month by emailing Pls and LMs who work with biological agents the link to [EH&S page](#) for flyers etc, and share [article](#). Safety Committee groups start using “five why’s” of root cause analysis – practice on at least one OARS report per month.
 - EH&S [Biological Safety page](#) has info on biohaz waste, sharps safety guides, etc.
 - EH&S has [new IBC page](#) in last year. The Institutional Biosafety Committee (IBC) reviews, approves and oversees research involving the use of recombinant or synthetic DNA/RNA and other biohazards. There is a new IBC Coordinator (Robert Kunsman) and Officer (Andrea Badger).
 - L&I: Fluke L&I completed; no violations, no penalties. Harborview L&I lesson learned: violation for lacking clear process for managing personnel uniforms potentially contaminated. Brought up distinction between uniform (employee maintains) vs. PPE (employer maintains).

Department Updates

- ME – steam pipe broken in mechanical room all weekend. Students called FS Customer Care line but didn’t forward to FOMS (didn’t call 911). Lots of steam in building but no real damage.
- MoIES/NanoES – Someone pulled fire alarms at three buildings in a row. UWPD caught and arrested him. Notes from evacuation: (1) occupant on crutches was good reminder to educate about areas of refuge, (2) occupants stopped in the street in the way of the fire truck rather than evacuating all the way to the Evacuation Assembly Area.

Next Meeting

- Nov 26th 2018 at 3pm, in Loew 355



University of Washington Accident / Incident Report

Report Number: 2018-10-003

Contact EH&S at 206-543-7388

Person Reporting Incident

Last Name: [REDACTED]	First Name: [REDACTED]
Phone: +1 [REDACTED]	Email: [REDACTED]
Occupation/Position: GRANTS MANAGER	Department: ENG: Civil and Environmental Engineering- Admin Staff
Date Reported (yyyy/mm/dd): 2018/10/01	Time of Reporting: 08:40 AM

Person Involved or Affected

Last Name: [REDACTED]	First Name: [REDACTED]
Phone: +1 [REDACTED]	Email: [REDACTED]
Occupation/Position: GRANTS MANAGER	Department: ENG: Civil and Environmental Engineering- Admin Staff

Incident Details

Date of Incident (yyyy/mm/dd): 2018/10/01	Time of Incident: 7:45 AM	When Shift Begins: N/A
Campus: Seattle	Incident Location/Parking Lot:	
Room:	Other: Husky Den Food Court	

Incident Details:
 slip and fell between DUB Street and Etc. in the HUB due to water drops on floor
 Attachment: No

Supervisor

Last Name: Hanson	First Name: Theodore
Phone: +1 206 616-1667	Email: tjhanson@uw.edu
Occupation/Position: ADMINISTRATOR	Department: ENG: Civil and Environmental Engineering

Classification

Level 1:
 Injury or Exposure, no first aid required,

Type of Incident

Injury Description: Bruise, Contusion,
 Body Parts Affected: Hands, Wrists, Knees, Feet, Ankles, Toes,
 Cause of Injury or Damage: Slip or Trip (No Fall),

Possible Causes

Equipment:
 Environment: Slippery, Uneven surface,
 Policies / Procedures:
 Human Factors:

Suggested corrective action by the affected party

put out wet signs or make sure the floors are swept dry regularly

Supervisor's Comments

ON FILE: Affected/Injured Employee's date of birth, gender, date of hire, and hours of employment.

Root Causes:

(Please look at all the factors that may have contributed to the accident. Such factors may include equipment, environment, policies, procedures, and personnel.)

Personnel in Husky Den need to make sure they mark wet floors, and sweep and mop more frequently.

Recommendations/Preventive Measures:

put out wet signs or make sure the floors are swept dry regularly

Corrective Actions Target Date (yyyy/mm/dd):
2018/10/11

Corrective Actions Complete Date (yyyy/mm/dd):

Other Comments:

This is more appropriately addressed to HFS, managers of Husky Den.

EHS Review

Last Name:**Haggard**

First Name:**Angelina M**

Phone Number:**+1 206 616-3442**

Email:**ahaggard@uw.edu**

Occupation/Position:

Department:

Comments:**10/1/18 forwarded to Scott Nelson, Adrian Santos, Denise Bender**



University of Washington Accident / Incident Report

Report Number: 2018-10-011

Contact EH&S at 206-543-7388

Person Reporting Incident

Last Name: █████	First Name: █████
Phone: █████	Email: █████
Occupation/Position: MEMS TECH INTERN	Department: Unspecified
Date Reported (yyyy/mm/dd): 2018/10/02	Time of Reporting: 03:21 PM

Person Involved or Affected

Last Name: █████	First Name: █████
Phone: █████	Email: █████
Occupation/Position: MEMS TECH INTERN	Department: ENG: Collaboration Core - WNF Managers

Incident Details

Date of Incident (yyyy/mm/dd): 2018/10/01	Time of Incident: Can Not Be Determined	When Shift Begins: 9:00 AM
Campus: Seattle	Incident Location/Parking Lot: FLUKE HALL	
Room: WNF	Other:	

Incident Details:

I was wearing a stained clean room suit all day Monday, and on Tuesday morning, I noticed a red mark on my arm that matched (shape and location) the stain on the suit. Although I did notice a stain on the right sleeve when i first opened the bag the suit was contained in, I had seen stained suits before so I assumed it was nothing, and continued use. The next day after noticing a correlation between the suit and the mark on my arm, I informed Michael Khbeis. He had the clean room suit PH tested with the results showing a neutral PH. I tried to make an appointment with a doctor on campus but unfortunately I would not have been seen until Thursday.

Attachment: No

Supervisor

Last Name: Khbeis	First Name: Michael
Phone: +1 206 543-5101	Email: khbeis@uw.edu
Occupation/Position: ASSOCIATE DIRECTOR MICROFABRICATION FACILITY	Department: ENG: Collaboration Core - WNF Managers

Classification

Level 1:
Injury or Exposure, no first aid required,

Type of Incident

Injury Description: Burn (Thermal, Chemical, Electrical),

Body Parts Affected: Arms,

Cause of Injury or Damage: Contact with Object: Bumped into Something,

Possible Causes

Equipment: Other,

Environment:

Policies / Procedures:

Human Factors:

Suggested corrective action by the affected party

Supervisor's Comments

Root Causes:

(Please look at all the factors that may have contributed to the accident. Such factors may include equipment, environment, policies, procedures, and personnel.)

There was a stain on the garment that relatively matched the spot on [REDACTED]' skin. We often have drops of photoresist from manual dispensing on the gowns that stain the gowns permanently. This gown was freshly laundered and individually packed. The spot was pH neutral. Not sure what would cause what I would classify as an allergic/sensitivity reaction. Obtained SDS from laundry service for cleaning agents and forward to EHS. They are diluted heavily. This is the second occurrence of similar type reaction in the past 1.5 years; however, the prior individual also did not have any reoccurrence.

Recommendations/Preventive Measures:

I am not sure what to recommend. The reaction location looked red and irritated on the skin, but there was no evidence of caustic or corrosive residues on the garment, The issue did not persist. I have retained the gown in a plastic bag in case EHS wants to analyze it further. Eventually, I will need to return this garment to circulation or we will be charged for a lost gown. [REDACTED] should report if there are any further issues with sensitivity.

Corrective Actions Target Date (yyyy/mm/dd):
2018/10/12

Corrective Actions Complete Date (yyyy/mm/dd):
2018/10/12

Other Comments:

EHS Review

Last Name:	First Name:	Phone Number:	Email:
Occupation/Position:		Department:	
Comments:			



University of Washington Accident / Incident Report

Report Number: 2018-10-019

Contact EH&S at 206-543-7388

Person Reporting Incident

Last Name: [REDACTED]	First Name: [REDACTED]
Phone: +1 [REDACTED]	Email: [REDACTED]
Occupation/Position: CONTINUING EDUCATION SPECIALIST 2 (E S 7)	Department: ENG: Deans Office-Academic Affairs
Date Reported (yyyy/mm/dd): 2018/10/05	Time of Reporting: 08:48 AM

Person Involved or Affected

Last Name: [REDACTED]	First Name: [REDACTED]
Phone: +1 [REDACTED]	Email: [REDACTED]
Occupation/Position: CONTINUING EDUCATION SPECIALIST 2 (E S 7)	Department: ENG: Deans Office-Academic Affairs

Incident Details

Date of Incident (yyyy/mm/dd): 2018/10/04	Time of Incident: 3:30 PM	When Shift Begins: 8:00 AM
Campus: Not assigned to Campus	Incident Location/Parking Lot: MAPLE BUILDING	
Room: 126	Other:	

Incident Details:

I was cutting glass in the Dabble Lab to practice my glass fusing for a workshop on glass fusing that I will be teaching. I was removing a sticker from some glass and my hand slipped and I cut it on the edge of the glass. I received a half-inch long cut on the third digit of my right hand.

Attachment: No

Supervisor

Last Name: Zimmerman	First Name: William
Phone: +1 206 616-4104	Email: wdzimm@uw.edu
Occupation/Position: MANAGER OF PROGRAM OPERATIONS (E S 8)	Department: SL: HFS Res Life: Res Life Admin

Classification

Level 1:
Injury requiring medical treatment (go to level 3 if in-patient hospitalization or amputation occurred),

Type of Incident

Injury Description: Cut, Laceration, Puncture, Scratch, Abrasion (Open Wound),

Body Parts Affected: Fingers,

Cause of Injury or Damage: Broken Glass, Splinter, Sharp Furniture Edge, etc.,

Possible Causes

Equipment:

Environment:

Policies / Procedures: Inadequate Instructions, Procedures,

Human Factors: Inattention,

Suggested corrective action by the affected party

Supervisor's Comments

Root Causes:
(Please look at all the factors that may have contributed to the accident. Such factors may include equipment, environment, policies, procedures, and personnel.)
Attention to detail, not wearing PPE.

Recommendations/Preventive Measures:
Wear PPE/cut resistant gloves when working with glass and sharp objects. Order enough PPE for all participants.

Corrective Actions Target Date (yyyy/mm/dd): 2018/10/08	Corrective Actions Complete Date (yyyy/mm/dd): 2018/10/08
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Other Comments:

EHS Review

Last Name:	First Name:	Phone Number:	Email:
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Occupation/Position:	Department:
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Comments:



University of Washington Accident / Incident Report

Report Number: 2018-10-037

Contact EH&S at 206-543-7388

Person Reporting Incident

Last Name: ██████████	First Name: ██████
Phone: +1 ██████████	Email: ██████████
Occupation/Position: RESEARCH ASSOCIATE PROFESSOR	Department: ENG: Aeronautics and Astronautics
Date Reported (yyyy/mm/dd): 2018/10/10	Time of Reporting: 03:55 PM

Person Involved or Affected

Last Name: ██████████	First Name: ██████
Phone: +1 ██████████	Email: ██████████
Occupation/Position: RESEARCH ASSOCIATE PROFESSOR	Department: ENG: Aeronautics and Astronautics

Incident Details

Date of Incident (yyyy/mm/dd): 2018/09/28	Time of Incident: 6:30 PM	When Shift Begins: N/A
Campus: Seattle	Incident Location/Parking Lot: PARKING LOT C-17	
Room: AER 012	Other:	

Incident Details:

During the final steps of hydro-testing a custom aluminum alloy oxidizer tank, the weld on one of its end caps failed and the tank was propelled into the door of the test cell. The door now has a dent but still works fine (it is a small aluminum access door to the test cell). The tank, however, is a total loss.

The cylindrical tank was resting horizontally in a cradle with properly sized mounts, but the restraining straps were not attached as per proper protocol. The tank was filled with water, and then pressurized with regulated N2 gas to a nominal 1500 psi. The regulator pressure was observed to increase to 1600 psi over the next few minutes, and then the weld failed. This same tank had passed a similar test in the prior year when using a hydraulic pump for pressurization; i.e., it was pumped up to 1500 psi and the pressure was maintained for 30 minutes without incident.

Attachment: No

Supervisor

Last Name: Hill	First Name: Kristi
Phone: +1 206 616-5950	Email: morgansn@uw.edu
Occupation/Position: PROFESSOR	Department: ENG: Aeronautics and Astronautics

Classification

Level 1:
Property damage only,

Type of Incident

Injury Description: Property Damage Only, None,

Body Parts Affected: None,

Cause of Injury or Damage: Pressure Extreme (High or Low),

Possible Causes

Equipment: Defective Tools, Equipment, Inadequate Guards/Barriers, Using Equipment Improperly,

Environment:

Policies / Procedures:

Human Factors:

Suggested corrective action by the affected party

All vessels undergoing hydro-testing will be restrained with straps and/or mounting brackets in an appropriate manner. Pressurization will only be done with the hydraulic rig normally used for this application. A removable protective barrier (plywood) will be installed between the test article and the access door to the test cell, which is to be closed whenever hydro-testing is in progress. The tank integrity will be monitored via gauges and video camera in test cell. Under no circumstances will anyone be exposed to a vessel pressurized beyond its normal use rating in the course of hydro-testing.

Supervisor's Comments

Root Causes:

(Please look at all the factors that may have contributed to the accident. Such factors may include equipment, environment, policies, procedures, and personnel.)

Recommendations/Preventive Measures:

Corrective Actions Target Date (yyyy/mm/dd):

Corrective Actions Complete Date (yyyy/mm/dd):

Other Comments:

EHS Review

Last Name: **Haggard**

First Name: **Angelina M**

Phone Number: **+1 206 616-3442**

Email: **ahaggard@uw.edu**

Occupation/Position:

Department:

Comments: **10/10/18 forwarded to Scott Nelson and Denise Bender**

SLIP, TRIPS, AND FALL (STF) INCIDENT CHECKLIST

Date of Incident:	Click or tap to enter a date.
OARS Number:	Click or tap here to enter text.
Employee Name:	Click or tap here to enter text.
Location of Incident:(inside/outside; building, room #)	Click or tap here to enter text.
Incident Description:	Click or tap here to enter text.

1. What was the first initiating event? See Appendix for slip, trip and fall mechanics discussion
 - Slip
 - Trip (includes caught on)
 - Loss of balance
 - Unknown

2. Which choice best describes the STF injury event?
 - A slip or trip that did not result in a fall a fall from an elevation, such as
 - A fall while standing on a chair
 - A fall from a ladder or stepstool
 - A fall down stairs or steps
 - A fall from a non-moving vehicle
 - Other fall from an elevation (describe) Click or tap here to enter text.

3. A same-level fall, such as
 - A fall while walking or working
 - A fall from a chair while sitting
 - A fall while tripping up stairs
 - Other same-level fall (describe) _____
 - Unknown

4. Were there any hazards present that may have contributed to the injury event?

- Contaminant (examples: water, soap, body fluid, grease/oil, coffee, wax, gel, slick, slippery not otherwise classified, etc.)
- Cord or tubing (examples: hose, medical tubing, phone cord, nurse call cord, equipment cords)
- Object (examples: objects or items on floor, propped against wall, or in the pathway)
- Ice or snow
- Surface irregularity due to buckled, loose, or damaged mat, carpeting, or rug
- Surface irregularity, other (examples: some part of the walking surface is irregular, cracked tiles, loose gravel, leaves, door guard, drain dip, utility hole in floor, hole in lawn)
- A curb or wheel stop
- Bodily reaction (examples: awkward posture, reaching, crouching, bending, carrying something, patient or object handling, or just stated as they "fell")
- Lack of space/restricted pathway
- Steps, stairs, or handrail
- Chair or stool
- Lighting
- Inappropriate or malfunctioning footwear
- Unknown / no specific hazard mentioned
- Other (please specify) [Click or tap here to enter text.](#)

Appendix

Investigations of Slip and Fall or Trip and Fall Incidents

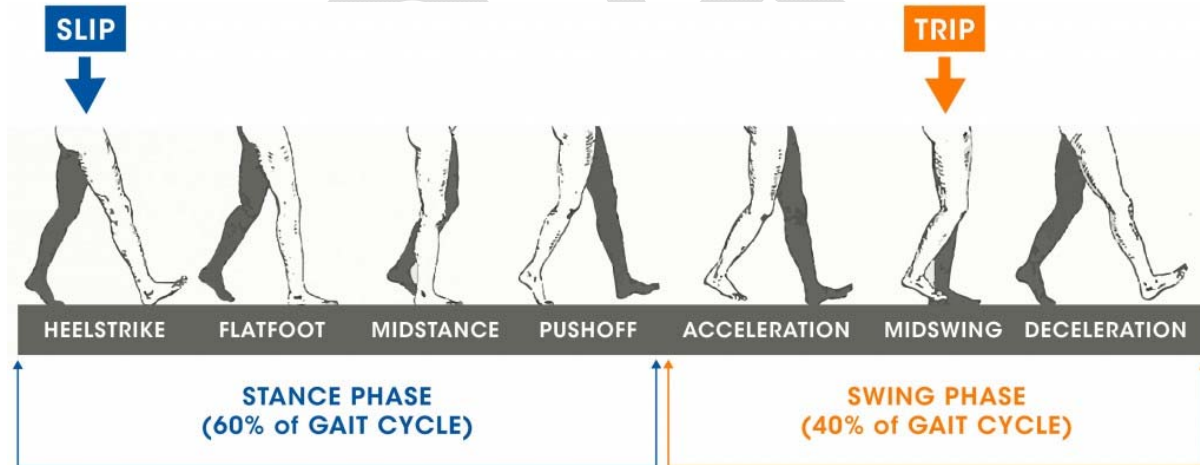
Feb 7, 2018 | [Biomechanics & Personal Injury](#), [Safety](#)

According to the World Health Organisation, falls are the second leading cause of accidental or unintentional injury deaths worldwide, and 37.3 million falls severe enough to require medical attention occur each year. Studying falls requires an understanding of how pedestrians typically move as they walk, the mechanics of the interaction between a person's foot and the surface they are walking on, as well as the sorts of obstacles that generally make walking surfaces unsafe. Therefore, investigations of slip and fall or trip and fall incidents are multidisciplinary, involving knowledge from kinesiology, biomechanics, physics, mechanical and civil engineering.

The Typical Gait Cycle

In modern *homo sapiens*, the typical gait cycle, which has been pretty much the same for at least 100,000 years, has been broken down by biomechanists from medical, kinesiology and engineering disciplines. The cycle begins and ends with the heel of one foot striking the ground, and can be divided into two phases: the stance phase, during which the foot is in contact with the ground; and the swing phase, during which the foot is lifted off the ground and swung through the air.

A more detailed model of the gait cycle consists of seven stages, which are illustrated in the figure below.



The stages of the Gait Cycle are:

- **Heelstrike** – This is where the foot makes first contact with the ground via the heel.
- **Flatfoot** – The entire sole of the foot is now in contact with the ground, and the body's centre of mass moves forward towards the planted foot.
- **Midstance** – The body's centre of mass passes over the foot on the ground as the opposite foot rises in the air.
- **Pushoff** – This is when the toes push off and the heel of the planted foot begins to raise.

- **Acceleration** – The foot begins to rise into the air and gain speed.
 - **Midswing** – This is where the foot is entirely off the ground and moves forward towards the body's centre of gravity.
 - **Deceleration** – The foot slows down and lowers to the ground again, heel first.
- As slips and trips are the results of different mechanisms, they tend to occur in different points of the gait cycle.

Slip and falls

A slip occurs when there is insufficient friction between the foot and the ground to complete the gait cycle normally, and the foot slides unexpectedly on a slippery surface. Slips occur most frequently during the heelstrike stage of the gait cycle. During a slip, the heel slides forward relative to the rest of the body, causing the centre of mass to be displaced rearward, starting a backwards fall.

Trip and falls

A trip occurs when the foot makes contact with a discontinuity or change in elevation in the walking surface. Trip and falls occur most frequently during the midswing stage of the gait cycle. As the foot swings forward, it strikes a discontinuity in the walking surface, and the body undergoes a forward rotation, resulting in the centre of mass being displaced forward of the normal balanced position, starting a forwards fall.

Mechanical Measurement and Analysis of Slip and Trip Hazards

In a slip scenario, it is the lack of adequate friction that causes the disruption of the gait cycle. We can measure friction, the unit less measurement of the ratio of horizontal to vertical forces between two surfaces sliding against each other. It is a measure of slipperiness in terms of slip index.

When measuring the slip index on a particular surface, it is important to take into account the relative motion between the foot and the surface. During a heel strike, only a small portion of the heel contacts the ground at first, and the surface must provide sufficient friction to allow the heel to remain stationary as the rest of the foot comes down (foot flat) and the body's centre of mass moves forward towards the midstance stage of gait.

In order to measure the slip index of a surface, we use an Excel Variable Incidence Tribometer with sequencer (pictured on the left). The Excel mimics the motion of a heel strike, therefore providing a close approximation of the interaction between the foot and the ground during gait. After measurement, the slip index of the surface in question can be compared to relevant material and civil engineering standards. This slip index can be measured on a dry or wet surface to best represent the conditions of the surface at the time of the slip event in question (see our [article on measuring slip index](#) for more details).

The generally accepted minimum slip index for a safe walking surface is 0.50 for an unloaded, normal walking condition (i.e. individual not carrying an object, walking forwards on a dry floor).[1] This slip index value allows for a factor of safety, as research has shown that most individuals only require traction of approximately 0.30 for normal walking[2] and up to 0.36 for more abrupt maneuvers such as turning.[3] It is typically the slip index or coefficient of friction that is less than 0.25 in one area on an otherwise slip resistant surface which causes most slip and falls.

In a trip scenario, it is usually a surface discontinuity or transition in the walking surface that poses the hazard. It is typically an unexpected single step or change in elevation of 12 mm or more that cause most trip and falls, because that can exceed the minimum toe clearance during the swing through phase of the gait, especially for older pedestrians (see [our article on the effect of age on slip / trip and falls](#)). In order to incorporate a factor of safety, standards require a sloped transition in cases where the change in elevation is greater than 6 mm.[4]

Depending on the situation, discontinuities are documented using a variety of appropriate mechanical measurement tools, and compared against relevant local regulations, standards (such as the Provincial Building Code, or Minimum Maintenance Standards) or Industry accepted standards such as ASTM (American Society for Testing and Materials). Rulers and combination squares graded down to 0.5 mm increments, or vernier calipers with precision and accuracy of +/- 0.01 mm may be utilized depending on the height of the discontinuity. The image to the left shows a measured surface difference in elevation of 8 millimeters using a combination square.

The following video illustrates how even a small unexpected irregularity can pose a trip hazard:

Conclusion

Investigations of slip and fall or trip and fall scenarios are multidisciplinary, as they combine knowledge from biomechanics (the gait cycle), mechanical engineering (taking the appropriate measurements of surfaces, slip index or discontinuities), and civil engineering (understanding the relevant codes and standards that apply to the location of the incident).

References

- [1] J. M. Miller, "Slippery work surface: toward a performance definition and quantitative coefficient of friction criteria", *J. Saf. Res.*, 14:145/158, 1983.
- [2] H. Fischer, S. Kirchberg, and T. Moessner, "Biomechanical Gait Analysis for the Extraction of Slip Resistance Test Parameters" *Industrial Health 2009, Dresden, Germany (Apr 21, 2009)*, article 617-625.
- [3] J. M. Burnfield, Y. Tsai, and C. M. Powers, "Comparison of utilized coefficient of friction during different walking tasks in persons with and without disability," *Gait & Posture*, Vol. 22 (2005), pp 82 – 88.
- [4] American Society for Testing and Materials, "Standard Practice for Safe Walking Surfaces", ASTM F1637-09.

U-WIDE HEALTH AND SAFETY COMMITTEE

October 10, 2018 Meeting Minutes | 1:00 pm - 2:30 pm | Foege N130A

	Elected Members (HSC Group)		Appointed Members (HSC Group)		Environmental Health & Safety (EH&S) Staff
X	Leslie Anderson, Co-Chair (1)		Paul Zuchowski (3)	X	Katia Harb
	Fieta Robinson (1)		Katie Beth (3)	X	Denise Bender
X	Ryan Hawkinson (1) alternate	X	Beth Hammermeister (4)		
	Sterling Luke (2)	X	Liz Kindred, Co-Chair (5)		
	Michelle Mazzei (2)		Nicole Sanderson (7)	X	Angelina Haggard
		X	David Zuckerman (10)		
X	Carol Harvey (4)	X	Sonia Honeydew (9)	X	Tracy Harvey
X	Ann Aumann (5)				
X	Natassia Stelmaszek (6)			X	Meli Ahumada
X	Beth Ramage (6)			X	Manisha Konnur
X	Kelly Carter-Lynn (7)				
	David Hirschberg (8)				
	Hannah Wilson (8)			X	Adam Geoffroy (7)
	Kameron Harmon (9)			X	Ron Fouty, UW Facilities
X	David Warren (10)				
X	Lesley Colby (Faculty Senate)				
	Labor Union Representation		Ex-Officio Members		Ex-Officio Members
	Paula Lukaszek, WFSE Local 1488		Tracey Mosier, UW Facilities		Felicia Foster, Atty General's Office
X	Christine Kang, Graduate & Professional Student Senate (GPSS), UAW 4121		Chris Pennington, UW Facilities		Lt. Chris Jaross, UWPD
	Vacant, SEIU Local 1199		Steve Charvat, Emergency Management		Chief John Vinson, UWPD
		X	Eli King, Emergency Management		Vacant, Transportation Services
			Megan Levy, Emergency Management	X	Ken Nielsen Claims Services
		X	Rick Gleason, DEOHS		Vacant, Capital Planning & Development
*x= Present at meeting (quorum = 11 elected and appointed members)					

Agenda

1. **Call to Order**
2. **Approval of September Meeting Minutes**
3. **National BioSafety Month**
4. **Organizational Group reports**
5. **EHS Reports**
6. **Union and Ex-Union Reports**
7. **Good of the Order**
8. **Adjourn**

Recorded by Manisha Konnur

1. **Call to Order:** Leslie Anderson called the meeting to order at 1:02p.m.
2. **Approval of September Meeting Minutes:** The September meeting minutes were approved as written.
3. **National BioSafety Month:** Zara Llewellyn, Biosafety Manager at UW-EH&S department, presented on National BioSafety Month (this will be a link to the presentation). She explained the principles of biosafety and also elaborated on the importance of safety culture at UW. She also provided a brief update on the Biosafety department and the upcoming launch of Biosafety webpage. Zara mentioned that they have magnets “what is in your freezer” and flyers on sharps and exposure response that are available from the Biosafety office.
4. **Organizational Group Reports:**

Denise responded to a question regarding the construction issues at Clark Hall. Contractor’s hired to manage the mortar grinding removal operations on the masonry exterior did not adhere to the construction lead regulations. As a result, lead-contaminated mortar was released into the environment and found inside Clark Hall on the window sills. The debris was cleaned and clearance sampling was conducted to ensure all contamination was removed.

 - a. **Group 1:** Ryan Hawkinson reviewed OARS reports. He reported that group 1 is reviewing the Accident Prevention Plan (APP) and discussed ideas for presentations and trainings for group1.
 - b. **Group 2:** Angie Haggard reported that group 2 did not have quorum and discussed safety prevention by design.
 - c. **Group 3:** Angie Haggard reported that the September meeting was cancelled.

- d. **Group 4** Beth Hammermeister reported that group 4 discussed OARS reports, accident prevention plan, increased representation from the School of Medicine and a discussion about off-campus events.
 - e. **Group 5:** Liz Kindred encouraged committee members to get their flu shots. Ann Aumann reported that there were more than 80 deaths last year in King County from the flu. An increase in trends around patient handling, possibly related to not using the patient lifts was reported.
 - f. **Group 6:** Beth Ramage and Natassia Stelmaszek provided updates. Beth mentioned about reviewing OARS and follow-up on the dumpster and platform report. The issue was resolved when a hopper was installed. She also mentioned about the OARS report on a vehicle incident in which the wheel fell off. She reported that there should be a checklist to follow-up for these kind of situations in the future.
 - g. **Group 7:** Kelly Carter-Lynn and Adam Geoffroy provided updates. They mentioned that the group met a day before and that there was no quorum and low attendance. Kelly mentioned that there should be a proxy present if the members cannot make it to the meeting. The APP addendum for UW Bothell is in its final stages. UW Bothell and Cascadia College are working on how to share resources on a dual campus. They are making preparations to host the U-Wide Health and Safety Committee in February 2019.
 - h. **Group 8:** No one from group 8 was present to report.
 - i. **Group 9:** Sonia Honeydew provided updates. She mentioned that the group met and reviewed one department's safety protocol and discussed regulated building materials in response to the Kirsten Wind Tunnel incident. Sonja also had a request to have a link to the evacuation maps on the website.
 - j. **Group 10:** David Warren provided an update for HSC 10. Bee season was reported to be over and that there was on report of a fish injury. He also mentioned the Everett Naval Station near-drowning incident. Group 10 meeting venue has also been moved to the Oceanography room due to Indoor Air Quality complaints in the former meeting room. EH&S is investigating the indoor air quality. Group 10 is reviewing UW Fall Protection Plan.
5. **EHS Reports and L&I updates:** Katia Harb, the interim Senior Director of UW-EH&S gave a presentation on EH&S personnel updates. She mentioned the organizational charts and changes. She also announced the vacancies in the EH&S department.

Denise Bender, the Assistant Director of Occupational Safety and Health gave an update on the root cause analysis course and mentioned that there will be a formal launch in February 2019, which will be further discussed in a future U-Wide meeting. Denise further gave L&I updates which included an appeal for a \$250 fine in UW-Tacoma. She also mentioned that there were no violations/penalties for the UW-Medical Center.

6. Union and Ex-Union Reports:

Risk Services/Claims Services: There were no updates s per Ken Nielsen.

UW Emergency Management: Eli King announced the Campus Clash is being hosted by the College Republicans on the 18th of October. The Union strike had been rescheduled for the next week. She also reported that the Business Continuity Plan was updated. Eli King also mentioned that there had been a pipeline rupture in Canada which will be impacting the campus. She also announced the Great Shakeout Drill scheduled on 10/18/2018.

UW Facilities: Ron Fouty reported that Facilities launched an initiative for root cause improvement; a systematic way of investigating incidents and injuries. Several Facilities employees also attended a Root Cause Analysis training hosted by EH&S on October 3.

7. Good of the Order

8. Adjourn: Leslie Anderson adjourned the meeting at 2:23pm.

DRAFT

University-Wide (U-Wide) Health and Safety Committee Meeting Agenda
November 14, 2018
1:00 p.m. – 2:30 p.m.

William H. Foege Bldg. N-130A
<http://www.washington.edu/maps/>

Regular Attendees:

- Current U-Wide Health and Safety Committee Members
<https://www.ehs.washington.edu/workplace/health-and-safety-committees>
- Environmental Health & Safety (EH&S) Staff:
 Katia Harb, Denise Bender, Emma Corell, Angie Haggard and Manisha Konnur

Agenda Items	Persons Responsible	Process	Time
Call to Order and Introductions	Leslie Anderson, Co-Chair	Robert's Rules of Order	5 min
Approve October Meeting Minutes	Committee Members	Robert's Rules of Order	5 min
2018 Worker's Compensation Report	Pam Nathan and Ken Nielsen, Claims Services	Presentation	45 min
Organizational Group Reports*	Committee Members	Discussion	20 min
EH&S Reports	Denise Bender, WA Labor & Industries Update	Discussion	5 min
Union and Ex Officio Reports	Union Representatives and Ex-Officio's	Discussion	5 min
Good of the Order	Committee Members	Discussion	5 min
Adjourn	Leslie Anderson, Co-Chair	Robert's Rules of Order	

*Organizational Group Reports include topics covered at their most recent meeting

Please send ideas for agenda items to the U-Wide Co-Chairs (Leslie Anderson and Liz Kindred) at least 2 weeks prior to our meetings.