Minutes
Department of Aeronautics & Astronautics
April 4, 2019

Attending: Acikmese, Breidenthal, Dabiri, Ferrante, Hermanson, Jarboe, Knowlen, Kurosaka, Little, Livne, Mesbahi, Morgansen, Salviato, Williams, Yang; McGrath, Maczko

Absent: Lum, Shumlak (sabbatical), Vagners

MINUTES
Minutes of the February 7, 2019 faculty meeting were unanimously approved. Minutes of the March 21, 2019 special faculty meeting were unanimously approved.

ANNOUNCEMENTS
• Providing feedback on committee engagements – please make sure to engage on committee remarks. Kim will reach out to committee chairs on feedback about professor involvement.
• The graduation speaker and Distinguished Alum for 2019 will be Rao Varanasi.
• Please send Prof. Morgansen any recommendations for Chair’s Distinguished lecture for the 2019-20 AY. The goal is to have one speaker per month and to have them all scheduled by mid-summer.
• Merit review deadlines: Merit materials are due 4/12 for Assistants and 4/30 for Associate and Full Professors. The Merit Evaluation Criteria is due 4/26 from all professors. Kim Maczko recently sent out a link to the survey and will send a reminder soon. Assistant professors will be reviewed at the May faculty meeting. It was recommended that professors upload all of their papers into their electronic merit box to save reviewers time from searching the papers on their own.
• REMINDER: It’s time to start thinking about summer work approvals - faculty who intend to work full-time for more than 2.5 months between 6/16 - 9/15 need to request approval from Prof. Morgansen first and then submit an online form to the College. Kim will send out instructions.
• REMINDER: Any faculty planning to do non-UW work for compensation over the summer need to submit the Outside Professional Work for Compensation form BEFORE the work starts.
• REMINDER: Managers please note that evaluations need to be completed for classified and professional staff before the end of the quarter. Prof. Morgansen will send out an email reminder soon. Pam McGrath will send the recommended form for professional staff.
• When planning exams, please be sure not to use problems that have been used for past exams. Students have complained that the answers are circulating.
• The university is biennium close is June 30th. During June there will be cutoff dates for reimbursement. Please be sure to submit by June 20th.
• Undergraduate admissions is now open. The deadline was extended to Monday, April 8th at 12pm. MS visit day is tomorrow, April 5th.
• June 15th is the department graduation ceremony. Please respond to Danyel Hacker with regalia needs.
• The JCATi symposium is April 25th. Everyone in the department has benefitted from or will benefit from JCATI so please come and support it.
• The kitchen will be left unlocked so that graduate students can use the sink.

REPORTS FROM STANDING COMMITTEES
No report from the following committees: Undergraduate Committee, Computer Committee, Faculty Search, Graduate Committee, Peer Evaluation Committee, Safety Committee, Aero/Astro Working Committees, Space
ENVIRONMENTAL HEALTH & SAFETY PRESENTATION
(see attachments)
Denise Bender from EH&S presented on accident prevention and reporting.

Something faculty should be aware of is faculty safety reviews are now tied to professional conduct.
Denise’s area focuses on lab safety such as making sure containers are labeled correctly, etc. They rarely get to see activities taking place in labs in real time so they are developing a new process to help characterize the risk of certain activities to use as a training aid. They meet with shop managers before the activity and identify hazards. They help the scientists that are familiar with the process characterize the consequences of a failure mode and what is needed to have in place to manage the process. After the activity they look for failures they didn’t anticipate and roll it into the risk assessment. The work product that is developed from this is called a job hazard analysis. This analysis can then be printed out and displayed where the activity usually takes place. This will eventually be put on the website and a library will be built with all these assessments in it.

CORAL UPDATE
Coral is a homebuilt program that Mechanical Engineering created. It is a system then integrates with UW NetIDs to track usage for labs and machines. We are implementing it in the shop. We will follow ME’s model with a swipe station at each machine. If you haven’t completed the registration process or aren’t rated for the machine, it will not turn on. It also looks for budget approval. It’s a system designed by engineers for engineers so it’s not particularly user friendly. We can customize it to how we want to use it. It can be installed during the spring quarter. We can use the summer to debug and customize and then put it into effect in the fall. There will be growing pains as we figure out what we need. Information about how to register will come out soon.

LECTURER AD
The department has been approved to hire one or more full-time or part-time Lecturers or Senior Lecturer, non-tenured. This is a three-year appointment. This position will be eligible for merit. It is a 9-month service period. We can add language to the ad that they have the option to teach during the summer. The rank of the appointment and compensation is commensurate with qualifications.

Prof. Morgansen will circulate the ad and faculty can send in their thoughts.

SPACE POLICY IMPROVEMENTS
(see attachments)
Sent email to faculty. These are recommended improvements. See document.
Prof. Kurosaka recommended changes to the current space policy. Please see the attached document.
Additions to the policy are in red.
Red part is the addition to the policy.
Mitsuru first
Tom second
Discussion:
- The Space Allocation Committee makes recommendations to the chair and the chair makes the final decision. These changes take the executive power from the chair.
- Would prefer not to vote on this today since faculty were not given enough to time to review. Need time to review and make sure there is no redundancy. The current policy is decisions are made by the
chair with input from the faculty. The current policy was written by Space Allocation Committee, and then sent to the faculty for input.

- A lot of the changes that are being proposed are already in the current policy.
- On the Promotion & Tenure Committee, all committee members are involved in dossier discussions but the involved department is not involved with the vote. So get input from person who is in the space but take them out of the vote.
- In a perfect world, constituents of the committee should be people not in the department who don’t have anything to gain/loss from outcomes. If they are a potential beneficiary of any decisions, they should not have a say.
- Space Allocation Committee should make recommendations to the chair. If we change the precedence, then other committees can bypass the chair on other decisions.
- Legal binding contract between the university and the agency. One person should not have the power to override a legally binding document. If space is already allocated in a proposal, then nobody should be able to remove the space.
- These additions to current policy are designed to protect everyone. Is it proper for the chair to make space allocation decision that directly effects them?
- It was suggested that the language be amended so that it states it is strongly recommended that nobody should be moved from a space while conducting research.
- What is the available space in the department? Which PI has how much space? Can this be shared? - Yes.
- Should be policy that one person from each program is on the Space Allocation Committee. If the committee makes a recommendation about the chair’s space, as long as the chair isn’t in the meeting, then it’s fine.

Since discussion was still ongoing when it was time to adjourn, a motion was made to table the discussion to May 2, 2019 faculty meeting.

Yes - 8  
No - 4  
Abstain - 0  

ADJOURNED  
Meeting adjourned at 1:30pm.
<table>
<thead>
<tr>
<th>Task</th>
<th>Hazard/Consequence</th>
<th>Consequence</th>
<th>Controls</th>
<th>Risk</th>
<th>Recommended/ Further Control Measures for Medium and High Risk Levels</th>
<th>Residual Risk</th>
<th>Implementation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transporting Generator with fuel</td>
<td>fuel spill</td>
<td>Environmental release into ground or storm water</td>
<td>Cap on fuel chamber. &lt; 2 gallons gasoline</td>
<td>1</td>
<td>No recommendations</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fueling generator</td>
<td>fuel spill</td>
<td>Environmental release into ground or storm water</td>
<td>Generator will be fueled outside 2 gallons or less</td>
<td>1</td>
<td>Spill pads and spill kit available</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fueling generator</td>
<td>contact with gasoline</td>
<td>personal injury - solvent exposure</td>
<td>PPE: Gloves/Safety Glasses</td>
<td>1</td>
<td>No recommendations</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fueling generator</td>
<td>when generator is hot - ignition of gasoline vapors</td>
<td>fire</td>
<td>Fire extinguisher &lt; 2 gallons fuel</td>
<td>3</td>
<td>Wait until generator cools down before refueling generator</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Setting up frame, sled and propulsion system</td>
<td>failing equipment - including frame, sled and propulsion equipment</td>
<td>ergonomic injury - concussion, struck by, strain</td>
<td>Frame is 4' x 4' x 10' and is assembled at location with small pieces of steel weighing less than 30 lbs. The sled is bolted to the frame with 3/4 inch bolts. The propulsion set-up is shackled to the sled with threaded rods that have a shear failure rating of over 1000 lbs. The total weight of the equipment (dry) is less than 600 lbs. Multiple people to lift the frame.</td>
<td>5</td>
<td>Strap frame to anchors in the ground.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Propulsion system falls during testing</td>
<td>shackle fall - equipment falls</td>
<td>ergonomic injury</td>
<td>Shackles have threaded rods to hold in place that are rated for &gt; 1000 lbs shear failure. Two shackles are used to hold propulsion equipment in place.</td>
<td>3</td>
<td>Provide carts and material handling devices to bring heavier materials to test location</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Connecting equipment to generator</td>
<td>wiring failures/overheats due to excess of amperage rating</td>
<td>electrical arc/fire</td>
<td>review equipment load versus generator wiring rated for current</td>
<td>3</td>
<td>Verify all of the loads for the equipment and extension cords will not exceed the wattage/amperage of the generator</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>wet conditions and electrical connections</td>
<td>electrical shock</td>
<td>Tents to cover apparatus</td>
<td>5</td>
<td>Provide GFCI for electrical connections to generator</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>electrical short-circuit</td>
<td>electrical shock</td>
<td>Ground generator Gloves</td>
<td>5</td>
<td>Add grounding attachment and ground rods for generators</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Turn on generator: air compressor</td>
<td>noise in excess of 80 dBA</td>
<td>Hearing loss</td>
<td>Review noise criteria from manufacturer of the generators/ compressors</td>
<td>3</td>
<td>Provide hearing protection - increase distance from source of noise. Post signage of test to warn public from area</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contact with hot surface</td>
<td>personal injury - thermal burn</td>
<td>PPE: Gloves</td>
<td>3</td>
<td>No recommendations</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
# Job Hazard Analysis

**University of Washington:** UW Seattle  
**Department:** Aeronautics and Astronautics

**Activity or Process:** LiPo Battery Operations  
**Building/Room:** AERB 117

**Job Title:** Student Researcher  
**Supervisor:** Christopher Lum, Ph.D

**Prepared By:** Nicholas Price  
**Date:** 1/8/2019

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This document is the certification of hazard assessment for PPE for the workplace.

<table>
<thead>
<tr>
<th>TASKS/STEPS</th>
<th>HAZARDS</th>
<th>CONTROLS (SAFEGUARDS)</th>
<th>PHOTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Charging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Connect battery to balance charger via x760 connection and multi-pin connector.</td>
<td>Fire: Charging at too high a rate, or not charging each cell to an equal voltage (a balanced charge) could cause a cell to &quot;pop&quot;. Exposure of the chemical cell to oxygen or excess heat, alongside the pressure release, can lead to a stream of flame ejected from the battery.</td>
<td>Track actions on battery log (i.e. start/stop time when charging, voltage, etc.)</td>
<td><img src="image" alt="Fireproof Battery Charging Box with Balance Charger/Discharger – AERB 117" /></td>
</tr>
<tr>
<td>2. Navigate the menu of the charger to the option “LiPo Balance Chg”. This ensures the charger uses the pin connection to balance the charge in each cell.</td>
<td>Swelling: Symptom of too high a charge rate for the state of the battery. This can also be symptomatic of a damaged battery if charge rate is reasonable but swelling results regardless.</td>
<td>ABC fire extinguisher</td>
<td></td>
</tr>
<tr>
<td>3. Use short press of “enter” button to cycle through settings of “Amps” and “Cells”. 2.5 – 4.0 A should be a safe charge rate for our 3S batteries.</td>
<td></td>
<td>Charging station is fire resistant and not in proximity to combustible materials (Batt Box)</td>
<td></td>
</tr>
<tr>
<td>4. Use long press of “enter” to start the charge cycle.</td>
<td></td>
<td>Attendant present at all times during charging process</td>
<td></td>
</tr>
</tbody>
</table>

Revised January 2019
4. Use long press of "enter" to start the discharge cycle.

<table>
<thead>
<tr>
<th>3 Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Connect battery to balance charger via xt60 connection and multi-pin connector.</td>
</tr>
<tr>
<td>2. Navigate the menu of the charger to the option &quot;LiPo Discharge&quot;. This ensures the charger uses the pin connection to balance the charge in each cell during the discharge cycle.</td>
</tr>
<tr>
<td>3. Use short press of &quot;enter&quot; button to cycle through settings of &quot;Amps&quot; and &quot;Cells&quot;. 2.0 – 2.5 A should be a safe discharge rate for our 3S batteries. Our balance charger will discharge at a lower rate as the 3S battery nears its baseline voltage of</td>
</tr>
</tbody>
</table>

- Fire: Greatest fire danger is during the discharge cycle for the battery. Batteries reach the end of their lifespan in a variety of conditions. Batteries in bad physical condition that swell during the discharge could "pop" and create fire as described in the charging section. |
- Swelling: Common for old batteries to swell at low charge. Creates the greatest danger for battery packs that have physical damage that could cause them to rupture under internal pressure. |
- Overheating: Much like the charge cycle, discharging at a high rate could overheat the battery. Again, this is |

- Discharge battery pack using the "LiPo Discharge" setting on balance charger/discharger. Only discharge in the fireproof Battery Box pictured above. |
- Check battery voltage to ensure battery is fully discharged. Baseline voltage should be ~3.2V/Cell. |
- Dispose of damaged batteries in e.Media bin on campus (if less than 5lbs). Otherwise, complete an Online Chemical Waste Collection Request. |
- Batteries to be disposed of should be placed in the designated "Dead Batteries" metal box in AERB 117 |

ABC Fire Extinguisher – AERB 117

Dead Batteries Box – AERB 117
5. General battery handling

- Corrosion: A pretty common occurrence with our batteries, usually forms on the connector leads of the XT60. Can lead to decreased battery performance, or a loss of power, particularly hazardous during flight of a UAV.
- Short occurs from contact with metal jewelry: Short circuiting a LiPo battery is the most common critical event to have occurred in our lab. The typical situation is that a battery connector is being worked on and the leads are accidentally shorted with a wire or other piece of metal the researcher isn’t paying attention to. Past events have resulted in a melted XT60 connector, fumes, and some smoke. The heat created by the high current can lead to a LiPo fire. Short circuited batteries should be disposed of.
- Using a battery above or below recommended use window (i.e. 3.0V/cell to 4.2V/cell)
- Improper soldering work on the connector could

- Hygiene: wash hands before & after battery handling
- Safety glasses
- Remove wristwatches, bracelets and rings
- Look for corrosion in the connector leads, replace connector if corrosion is found.
- Always seal exposed wire in electrical tape as a temporary fix. Permanently fix with heat shrink when/if new soldering work is finished.
- Use handheld battery checker to confirm nominal battery charge (fully charged, cells balanced) before use
- Always inventory LiPo batteries in the component tracker
- LiPo batteries should ideally be limited to 300 charge cycles. It’s commonly understood that hobby-grade LiPos begin to lose performance past this point.
- Purchase batteries from reputable sources. This generally means not buying used LiPos, and try to buy new from Hobby RC suppliers which post positive user reviews of the batteries.
currents. LiPos have an interesting behavior where periods of high current draw will temporarily reduce voltage across the cells. Ergo, a voltage failsafe on takeoff may indicate too high a current draw from the motor/other systems. In nominal performance from the battery, the voltage should not decrease to the point of triggering a failsafe during takeoff, thus a failsafe can be an indicator of a battery nearing the end of its lifespan.

- ABC Fire Extinguisher
- In the event of a LiPo fire as a result of a UAV crash, use best discretion when determining if it is safe to put out the fire yourself. Always call 911 first.
I have read and understand the contents of the job hazard analysis and the controls required to mitigate the risks from the identified hazards

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td>Nicholas Price</td>
<td>1/8/2019</td>
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The space allocation guidelines improvements

Preamble

As a steward of the space entrusted by the Washington state, it is the collective duty and responsibility of the department to utilize effectively the space in order to advance AA technology for the economic development of the State and to foster the intellectual and professional growth of students. To fulfill this public obligation, the policy must be continuously improved.

For this, I make a motion to add the following to the space allocation guidelines:

(1) Recusal to avoid conflicts of interest (in ‘Space Allocation and Utilization Committee’ section)

(2) No space transfer for the duration of funded projects (in ‘The Space Request Process’ section)
Space Allocation and Utilization Committee

A Space Allocation and Utilization Committee (SAUC) will be formed to act as a consultative body to the department chair, who makes the final decisions on the allocation of departmental space. The term of service on SAUC will typically be three years. In addition, the department’s administrator and the Associate chair for academics will serve as ex-officio members of the SAUC, to provide necessary data and information. Normally the SAUC will meet quarterly or more frequently as needed, during the academic year, to review existing allocations, to deal with urgent space requests or issues, and, new faculty needs, etc.

The chair and members of the SAUC will be appointed by the department chair. At the department chair’s discretion, one third of the SAUC members will be replaced or reappointed annually. The SAUC chair and members will serve no more than two consecutive three-year terms.

It is the role of the SAUC to review the existing and proposed uses of a space considered for reallocation, adjudicate any conflicts, and submit information and recommendations to the department chair. The affected individuals or groups will fully participate in this process through their representative on the SAUC, and through direct interactions with the SAUC and the department chair.

To maintain fairness and impartiality and in order to avoid any appearances of conflict-of-interest, SAUC member will recuse oneself whenever the space decision involves that member’s space needs. On such an occasion, the SAUC chair will replace the recused member with another faculty member in the same discipline.

In the case that the space involves the SAUC chair or the department chair, or any COE official, the matter will be brought before the entire departmental faculty, who will collectively discuss and decide the outcome.
The Space Request Process

If a space need arises or is anticipated, e.g., for a new faculty or staff hire, a new activity based on a planned submission of a research or educational proposal to a funding agency, or based on other criteria that do not involve funding, a request for space is to be submitted via email to the department chair and SAUC chair.

The department chair will consult with the SAUC regarding all space allocation requests.

If the requested space is not immediately available within the department, the department chair asks the petitioner to submit a formal request by e-mail specifying the requirements of the space and the justification of the need. The department chair reviews the request and submits it via e-mail to the chair of the SAUC. If no suitable space is found within the department, the SAUC may choose to recommend a reallocation based on the space allocation metrics, or may recommend that space be sought in another unit in the College or the University. After evaluating the request and any space that may meet the needs of the request, the SAUC submits a recommendation report to the department chair on: the merits of the request, the availability of suitable space within the department, and the expected ability of the proposed activity to secure funding and satisfy the space allocation metrics. If space is not immediately available, the SAUC will make every effort to provide the chair with a number of alternative solutions.

If the department chair accepts a recommendation for reallocation of space within the department, he/she proceeds to negotiate with the various stakeholders on the basis of the space allocation metrics.

While externally funded grant(s)/contract(s) activities are being conducted in the space specified in the proposal for the said grant(s)/contract(s), no transfer/reallocation of the space shall be made for the duration of the said grant(s)/contract(s), so as not to interfere with the fulfillment of the legally binding contractual obligations, unless an agreement for such transfer/reallocation is reached among the parties involved.