

AOE DEPARTMENT SAFETY REVIEW FORM FOR **EXPERIMENTAL RIGS**

In the context of this form 'rig' refers to any potentially hazardous piece of equipment whose safe operation requires more detailed instructions and procedures than can be included in the Experimental Workspace Safety Review form for the area in which the rig is housed. Examples include a wind tunnel, laser system, high pressure tank, material testing machine, rotating system.

Before any such rig in the Department of Aerospace and Ocean Engineering is brought into operation, and **at least once per year** thereafter, a copy of this form must be completed, signed and submitted by the responsible faculty/staff member (usually the principal investigator). When an existing rig undergoes modifications which could affect its safety, a new copy of this form must be submitted by the responsible faculty/staff member at that time, and before it is operated again.

Completed forms should be submitted to the AOE Assistant Department Head for Facilities (Michael Philen) and should also be made available to other faculty/staff with relevant expertise, or with direct involvement in the rig or space where it is housed. Any advice resulting from this interaction should be copied to the Assistant Department Head, as well as being transmitted back to the responsible faculty/staff member. Once the responsible faculty/staff member is satisfied that all safety concerns have been met the final version of the form should be signed and submitted and a copy displayed in a prominent position on or adjacent to the rig and on the department safety website. The responsible faculty/staff member may then authorize its operation. Under no circumstances may a rig be operated without a completed, current copy of this form prominently displayed.

Date of form 8/15/2023 Form expires (no more than 1 year after form date): 8/14/2024

Name of Rig Water Tank.....

Workspace where rig is located VTSS150
Include room, building and name given to the space on the EHS training website.

Faculty/staff member responsible for the rig and its safety Christine Gilbert.....

Office Address 620 McBryde Hall..... Phone 540-231-9428..... Email ciked@vt.edu.....

1. An evaluation of the above rig has been performed and the following safety risks have been identified (append details where necessary):

The water tank presents a drowning risk and electrocution risk.

2. The following actions have been taken to minimize those risks (append details where necessary):

Entry to the tank is prohibited unless trained. Tank shall be kept a safe distance from electrical panels. Electrical components that need to be installed near the tank or rig must be installed when the tank is empty.

3. A safe operating procedure has been developed (attach the procedure to this form). This includes protective equipment to be worn, whether users may operate the rig alone and, if necessary, precautions to be taken by others working in the same laboratory. The procedure is in a form suitable for posting on the rig.

4. Check one and include a list: The rig may only be operated by the following individuals.

The rig may only be operated under the supervision of the following individuals.

(List individuals here)

Christine Gilbert, Ben Darden, Oscar Johansson, Rob Van Erem

5. The above individuals are all registered on the EHS training website at https://secure.hosting.vt.edu/www.ehss.vt.edu/training/training_report.php and have taken all appropriate safety training courses. Their training is current and is recorded on the EHS website, under the above workspace name. The appropriate safety courses are (list here):

- General Laboratory Safety
- Electrical Awareness
- HazCom Right to Know
- Fire Extinguishers
- PPE Awareness
- Lockout-Tagout

Signature of faculty/staff member responsible
for the rig and its safety Date

 8/15/2023

Wedge Drop Test Procedure

- Testing rig can be operated without anyone else in the lab.
- Installation of measurement equipment and wedge model are to be done when the tank is empty.
- Before filling the tank with water, all wires that will carry electricity must be inspected and be fixed in locations that will remain dry.
- When filling the water tank, there must be one student in the lab to ensure that the tank does not leak, overflow, or wet any electronic component.
- Before performing any experimental run, the path of the falling wedge must be double-checked to ensure there are no obstructions in the path. The bearings and rails should be checked to sure all surfaces are smooth.
- All sensors will be powered on and their signals should be zeroed. The signals should be checked for anomalous readings that indict poorly connected cables (open circuits or shorts).
- Before starting an experimental run, the triggering system should be activated to ensure that it is working properly.
- The data acquisition system and camera must be reset before the run.
- During the run, students should be observant that all the components of the experiment are running as expected. For example, music should not be on so that students can hear noises indicating something is stuck or broken. Student should limit all distractions during testing.
- Data should be saved.
- After the wedge has dropped into the water, students should check that there are no loose wires or components. Anything loose should be powered off before attempting to move it.
- Students should check that the path to move the wedge back to its position above the tank is clear before attempting to raise the model.
- Turn off all power when finished testing and check that there are no loose cables near the water tank. On the weekends, all sensors and equipment should be unplugged unless there will be weekend testing.