NEWT Safety Plan 2020

NEWT is ingraining a positive safety culture so that every worker or visitor in NEWT labs or testbeds thinks and behaves in a way that prioritizes their own safety as well as the safety of those around them. There are six elements in the NEWT safety plan: 1) securing commitment from leadership; 2) identifying hazards and assessing risks; 3) developing a structured communication program; 4) training all participants and communicating safety with visitors; 5) reporting all accidents, incidents, and near misses; and 6) evaluating safety each year (www.worksafemt.com/safety/build-safety-program/how-to-build-your-safety-program/). A timeline for implementation and yearly follow up is provided below.

1. Securing Commitment from Leadership

NEWT leadership is committed to safety. Our commitment is demonstrated through the drafting, execution and continuous improvement of this safety plan. Roles and responsibilities are described in the reporting section below.

2. Identifying Hazards and Assessing Risks

Each year the NEWT Directors and Leadership in concert with the Student Leadership Council (SLC) surveys students, postdocs, research scientists, local safety officers, staff, and faculty to determine the types of hazards—workplace, activity, and environmental—present in the lab and testbeds the degree of danger represented by those hazards, and the frequency with which those hazards occur. This survey must be completed by each NEWT participant regardless of whether or not they have new hazards to report to the center. The NEWT administration and the SLC performs a preliminary assessment of the risks by ranking the degree of the hazard and the frequency with which the hazard occurs in NEWT labs and testbeds. This assessment is covered each year in the safety evaluation meeting (see Yearly Timeline page 7).

3. Developing a Structured Communication Program

In collaboration with safety officers from all four academic partners (i.e., Rice University, Arizona State University, The University of Texas at El Paso, and Yale University), NEWT develops/updates a library of slides for each NEWT-relevant risk. The top risks are developed/updated into a longer NEWT safety onboarding presentation. NEWT develops/updates a webpage (www.newtcenter.org/safety) specifically on safety that contains links to a recording of this onboarding presentation and all safety moment slides. NEWT will also link to safety and visitor portals from all NEWT academic partners. These portals also contain information about emergency action plans, fire prevention, electrical safety and hearing conservation programs as well as a variety of thorough resources developed by our partners. NEWT will also link to

portals related to specific issues present in NEWT such as the nanomaterial safety resources from the American Chemical Society [link]and a primer from the National Institutes of Health on personal protective equipment [link].

4. Training All Participants and Communicating Safety with Visitors

New NEWT Participants

Baseline training for all NEWT researchers planning to work in a laboratory setting is mandatory, and is provided through their home university before admission to their lab. These training programs comply with federal regulations (e.g., CFR 29 CFR 1910, 10 CFR 835.501(d) and 10 CFR 835.1102) and appropriate state guidelines. Details of those required training programs are provided on the Rice [link], ASU [link], Yale [link] and UTEP [link] safety websites, and will also be linked on the NEWT safety page. (www.newtcenter.org/safety)

The above training programs pertain to common hazards found in research labs. In addition, NEWT labs face two challenges that require attention: (1) potential exposure (e.g., inhalation) of some nanoparticles synthesized and/or used in specific labs; and (2) frequent visitors that include collaborating students from other labs/universities, visiting scholars from foreign academic partner institutions, and industrial collaborators. Therefore, NEWT provides additional training to address safety requirements associated with these NEWT-specific challenges, as discussed below.

Participants and visiting researchers in all NEWT labs and testbeds will become familiar with any NEWT-specific hazards using an onboarding presentation (e.g., we highlight specific nanoparticle related safety protocols developed by the American Chemical Society [link] and Duke University [link]). This presentation is a living document updated each year in November and December by the SLC, Administrative Director, and Center Director and Deputy Director (see Yearly Timeline on page 7). NEWT uses this presentation in at least four instances:

1. In September as part of NEWT orientation for students joining NEWT.
2. In January as a refresher for the entire NEWT team during an All-Hands meeting.
3. In June for Research Experiences for Undergraduate (REU) and Research Experiences for Teachers (RET) programs as well as any other NEWT summer programs.
4. Prior to lab work for other undergraduate and graduate researchers, visiting scholars from foreign academic partner institutions, and industrial collaborators in NEWT labs or testbeds.

Please see the Yearly Timeline on page 7 for more details.

NEWT students and postdocs can request travel funds from the SLC to visit other laboratories at partner schools. Please see the Student Travel Grant Participants section below for safety procedures for that program.

Ongoing Training of NEWT Team Members

Throughout the year, each team meeting held by NEWT begins with either project leads, thrust leads or directors presenting a safety moment slide from the NEWT library. The safety moment also highlights the importance of reporting near misses that occur in NEWT. When an accident, incident, or near miss is reported to NEWT, a lengthier discussion of what went right and what went wrong will replace the usual safety moment; notes from the discussion are provided to the local safety officers.

NEWT will also invite members of industry for 10-minute guest safety moments (or show pre-recorded presentations at all hands meetings) at least once every six months. This will give students and postdocs baseline knowledge about the safety cultures of industry and drinking water treatment companies. It will also give them a head start for a career in industry or partnering with industry in the future.

Student Travel Grant Participants

Student travel grant recipients are required to forward proof of local safety training approval to the Administrative Director and the local faculty host one week before traveling. Safety officers from each school review introductory safety training materials at each partner school to determine when training would not be required for traveling NEWT students. Training would not be required if the hosting partner university determines that the student has received comparable training at their home institution.

Visitors

Visitors refers here to those who are not performing any work in the lab. Visitors stay for a few minutes to a few hours in each lab (Visiting researchers are those who plan to work in labs and their trainings are described above). NEWT provides the safety webpage with local resources to all visitors. A visitor section at the top of the page highlights the use of personal protective equipment. The visitor section also prompts visitors to ask any safety questions they may have before or during their visit. *Visitors are provided appropriate personal protection equipment and reminded of safety and emergency protocols by individual PIs and students and staff while touring facilities. All NEWT team members are responsible for the safety of visitors.*

5. Reporting All Accidents, Incidents, and Near Misses

Our universities follow federal and state lab safety guidelines and perform regular unannounced inspections of labs and testbeds and evaluate university safety processes annually. In addition, NEWT's safety plan includes a key element in which local safety officers notify NEWT university leads of any accident, incident, or near miss in NEWT labs or testbeds within 2 business days of its occurrence. NEWT university leads then report such incidents to the NEWT Administrative Director. In turn the NEWT Director and Deputy Director as well as corresponding deans are informed. The directors ensure that corrective action and compliance is achieved to ensure safety qualify for continued funding. This action includes conducting a review of what went right and what went wrong at the start of the next All-Hands Meeting. This approach provides a simple but important communication channel to aid NEWT's efforts to ingrain and ensure a culture of safety.

Reporting roles and responsibilities include:

- *Researchers in the lab*—Have and demonstrate a positive safety-first mindset. Report near misses to the faculty lab lead and the NEWT Administrative Director (accidents and incidents will be reported to NEWT through the existing environmental health and safety channels). The Administrative Director will forward these reports immediately to the Director and Deputy Director. Report accidents, incidents, and near misses through the proper environmental health and safety channels at each partner university.
- *Faculty*—Have and demonstrate a positive safety-first mindset. Report near misses to NEWT Administrative Director (accidents and incidents will be reported to NEWT through the existing environmental health and safety channels). The Administrative Director forwards these reports immediately to the Director and Deputy Director. Report accidents, incidents, and near misses through the proper environmental health and safety channels at each partner university.
    - *Local environmental health and safety officers*—Follow university procedures concerning inspections and reporting. Report accidents, incidents, and near misses in NEWT labs and testbeds to local NEWT lead faculty and the NEWT Administrative Director as well as NEWT Director and Deputy Director. Rice University
      -Sr. Safety Specialist - Noel Nguyen (nn6@rice.edu)
    - Arizona State University
      -Asst. Dir in Charge of Fulton Safety Office - Rita Bottesch (Rita.Bottesch@asu.edu)
      -Laboratory Manager SSEBE - Stan Klonowski (stan.klonowski@asu.edu)
      -Laboratory Manager SEMTE - Fred Pena (fred.pena@asu.edu)
    - University of Texas at El Paso
      -Safety Consultant - Gus Rojo (grojo@utep.edu)
    - Yale University
      -Safety Advisor - Shumin Bian (shumin.bian@yale.edu)

- *NEWT Administrative Director*—Have and demonstrate a positive safety-first mindset. Collect and record all reported accidents, incidents, and near misses. Aid Director and Deputy Director in preparing a discussion regarding what went wrong and what went right for the next NEWT All-Hands Meeting. Provide a summary of the discussion to all partner safety officers. Follow up with deans and local officers on corrective actions.

- *NEWT Director and Deputy Director*—Have and demonstrate a positive safety-first mindset. Lead a discussion regarding what went wrong and what went right at the next NEWT All-Hands Meeting. (A Thrust leader is the discussion leader if both Directors cannot attend the meeting.) Report accidents, incidents, and near misses to NEWT deans. Follow up on corrective actions.

6. Evaluating Safety Each Year

In conjunction with the yearly hazards survey in November, the leadership commits to meeting to review any newly identified hazards as well as this safety plan. At least one industry member as well as safety officers from each partner institution participate to provide feedback and improve the plan. The Administrative Director is responsible for calling this meeting and executing any revisions suggested by the group in partnership with the NEWT Director and Deputy Director. NEWT leadership is required to attend this meeting. Findings from this meeting will be reported to the Deans' Council and University safety leaders.

Timelines

Initial Timeline

Date	Activity	Responsible Groups
December 2019	Create hazard survey	NEWT Directors and Leadership, Student Leadership Council, Local Safety Officers
January 2020	Send required hazards survey to all NEWT researchers	NEWT Directors and Leadership, Student Leadership Council
	Review each other's safety trainings by each partner school	Local Safety Officers
February 2020	Survey results returned and NEWT risk is determined from hazard and frequency of occurrence	NEWT Directors and Leadership, Student Leadership Council, Local Safety Officers
April 2020	Safety webpage resource launched	NEWT Directors and Leadership, Local Safety Officers
	One-page safety moment library launched	NEWT Directors and Leadership, Local Safety Officers
May 2020	Onboarding safety presentation complete and delivered to incoming summer participants	NEWT Directors and Leadership
	One-page safety moment library completed for risks identified in 2020 survey	NEWT Directors and Leadership, Local Safety Officers

Yearly Timeline

Date	Activity	Responsible Groups
Ongoing	Lab inspections	Local Safety Officers
	All-Hands Meeting to report what went wrong/right	NEWT Directors and Leadership
	Safety moments delivered before each NEWT meeting	NEWT Directors and Leadership
September	Safety onboarding presentation delivered to new NEWT students	NEWT Directors and Leadership
November	Send required hazards survey to all NEWT researchers	NEWT Directors and Leadership, Student Leadership Council
December	Survey results returned and new NEWT risks are determined from hazard and frequency of occurrence	NEWT Directors and Leadership, Student Leadership Council, Local Safety Officers
	Yearly meeting to review any newly identified risks, the safety plan, and safety trainings	NEWT Directors and Leadership, Local Safety Officers, Industry Members
January	Yearly safety onboarding presentation updated and delivered at an All-Hands Meeting	NEWT Directors and Leadership, Student Leadership Council, Local Safety Officers, NEWT Directors
February	One-page safety moment library updated with new risks	NEWT Directors and Leadership, Student Leadership Council
	Safety webpage resource updated with new materials (if needed)	NEWT Directors and Leadership, Local Safety Officers