



M E M O R A N D U M

Date: March 23, 2022

To: Chemical Hygiene Committee

From: J. Marvin Pratt, Director of Environmental Health and Safety

Subject: Chemical Hygiene Committee

Present: Marvin Pratt, Kenny Wahl, Holly Swan, Betsey Tamietti, Jonathan Day, Blain Wells, Randy Miller, Daniel D. Clark, Charles R. Sellers

Absent:

The Chemical Hygiene Committee meeting commenced at 1:00 p.m. via Zoom meeting.

I. Welcome

Mr. Pratt opened the meeting by welcoming the Committee members. The minutes of the previous meeting were approved as written.

II. Review of Accident/Incidents

Mr. Pratt stated there have not been any accidents, but there has been one incident. Mr. Wahl reviewed the incident. In October 2021 there was a relatively small explosion in the Chemistry lab in the new Science building. No one was hurt. EHS was notified immediately. Mr. Wahl and Ms. Swan went to investigate. No one was working with the chemical directly at the time of the explosion. The nearest people, two student researchers, were about ten to twelve feet away.

The resulting investigation discovered that in June 2021 an undergraduate research student had been substituting a different acid in her work that the protocols called detailed. This substituted acid was nitric acid, which is an oxidizing acid. This oxidizing property was not recognized as a hazard. It was mixed with methanol, which is a flammable organic solvent. Mixing oxidizers with organics especially flammable solvents is a chemical incompatibility. Mixing these two items created methyl nitrate which is a high explosive. In this case the one-liter glass bottle that exploded was mixed in June. It stayed in the fume hood until October when it exploded unattended. What triggered it to explode is not known. Some form of energy input is typical like friction, heat,

vibration. No one was using the bottle or working in the fume hood at the time of the explosion. The explosion sent glass debris on the floor and onto counter tops over ten feet away. Other chemicals were present in the fume hood and some bottles were damaged. Chemical containers in the fume hood at the time of the explosion included strong acids, strong bases, strong oxidizers, organic solvents and toxic chemicals.

EHS staff discovered the label on the floor that indicated the mixture of nitric acid and methanol. EHS staff deemed the area safe enough to clean up. EHS staff cleaned up the broken glass and the resulting chemical mix that was in the fume hood and on the floor. Chemistry staff swept up the glass debris that was on the floor and counter tops. EHS removed the chemical waste the following day. Neutralization of the nitrated glycerin was completed by Chemistry faculty the following week. EHS then removed this waste as well. Mr. Clark asked about the labeling of the bottle that exploded. Mr. Wahl reported the bottle was originally a bottle of nitric acid, with a Sharpie mark making a clarification that it was 6 molar. Another Sharpie marking indicated “plus 25% methanol”.

Mr. Pratt discussed lessons learned from this incident. There was a lack of supervision. Initially a student was given a written procedure to carry this out largely unsupervised. The modified procedure was then handed off to another student who was working largely unsupervised.

The different hazards of the materials are not always understood. It was surprising to the EHS staff that the oxidizer was introduced. Use appropriate label hazards on bottles. Prompt disposals of chemicals is important. This waste was determined to be created in June 2021 and the explosion happened in October 2021. Nothing was added to the bottle in between those dates.

Within the fume hood there were incompatibles. They were all sealed. Acids and bases should be segregated in a fume hood. EHS also wants to remind everyone that “Green chemicals” is an environmental term, not a safety term. “Green chemicals” are about harm to the environment as opposed to people. It doesn’t mean “harmless”. Personal Protection Equipment (PPE) in the area was degraded. PPE is a consumable commodity, it will get dirty, damaged and degrade. Ms. Swan added that an appropriate spill kit on site is an important safety measure.

Mr. Pratt was asked if he received any feedback from the departments regarding his lessons learned from this incident. Mr. Pratt reported that he did not receive any feedback. Mr. Wells reported that he purchased some smaller absorbent pads and is keeping them in the faculty research lab and one in each stockroom. Mr. Pratt questioned whether these pads are labeled as spill materials. Mr. Wells reported he will make appropriate labels. Mr. Wells asked if EHS wanted an acid/base solvent neutralizer set assembled. Ms. Swan reported that would be helpful in research labs.

Mr. Wahl reported that the Butte County CUPA are asking him to put spill kits on his map of campus. It was asked, What is the next step after using a spill kit? How do you dispose of it? Mr. Pratt asked Mr. Wells to create labels to explain how to dispose of used spill kits. Mr. Wells asked if a spill kit contains additional PPE. Mr. Wells reported that if he builds spill kits himself, he can include some basic PPE. Containers will need to be included in the spill kit to contain the waste of the spill. Mr. Wahl recommended choosing containers with lids that have gaskets. Mr. Wahl will send Mr. Wells instructions for disposal of hazardous waste that can be printed and taped to the containers.

Mr. Pratt has been working with Dr. Chris Nichols to identify appropriate trainings in CSU Learn for research students. The students should be assigned, at a minimum, the Lab Safety Fundamentals training. Then individual trainings can also be assigned. Mr. Pratt was asked if there is the ability to add additional modules to CSU Learn. Mr. Pratt responded that yes, we can. A learning quiz can be added to the training modules as well.

III. RSS

Ms. Swan reported that she is completing her quarterly report cards. She has met with Physics and Geo-Sciences this month. RSS is changing the Assess module. It will have extra features. There will be help documents and tutorials available. It was asked of Ms. Swan if she talked with Dan Picard in the Aquatic Bio-Assessment Lab. She had and she will reach out to departments and labs that are missing modules.

IV. Lab Inspections

Ms. Swan will be doing the wet lab inspections and Heather Long will be doing the shop lab inspections. Ms. Swan will first focus on research labs. She has started with Biology. In the summertime, she will focus on teaching labs. She sends her inspection through RSS along with email instructions. Mr. Pratt added that the Chancellor's office included in the Executive Order 1039 that departments and EHS are required to do periodic inspections. Even though EHS is going to do inspections it does not mean the departments do not need to do their own inspections. It was asked if RSS will be used to log department inspections. Ms. Swan reported that yes, there is a Laboratory Self Inspection that should be used. Mr. Pratt reported that we don't have an abridged shop checklist yet. It is being developed with RSS.

V. Chemical Hygiene Plan-Faculty Engagement

Mr. Pratt reported that we have a Laboratory Safety Standard program. Part of this program is to have a Chemical Hygiene committee and a Chemical Hygiene Plan. A third component is that we train our employees on the Chemical Hygiene Plan. We use the Lab Safety Fundamentals course as our primary laboratory safety course. There is a small gap between the Lab Safety Fundamentals course and our Chemical Hygiene Plan. Without assigning another training to faculty and staff, Mr. Pratt doesn't know how to

get our written Chemical Hygiene Plan to the faculty and staff that need it. One solution could be we take Chico State specific content out of the plan and create a Power Point for training. Another idea is to have the Chemical Hygiene Plan as a pdf and post it on Black Board. Then the students need to check that they have read it. The written plan is required to be reviewed annually or whenever there are changes in the workplace. It could be assigned to the users every three years. If the Chemical Hygiene Plan were changed to a Power Point presentation, it might be helpful. The Lab Safety Fundamentals in CSU Learn can be modified to add the Chemical Hygiene Plan to it. It was asked if Mr. Pratt must show how he is providing the training. He reported that yes, if we were audited or OSHA showed up. Mr. Pratt will look at the different options.

There being no further business, the meeting adjourned at 1:55 p.m.