Metrology Laboratory Safety

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Many states around the country have a Metrology Laboratory. These laboratories store their state's mass and volume standards, assist state inspectors by calibrating field standards, and calibrate private company's weights, test measures, and various other measuring devices. While in the course of their job, metrology laboratory staff encounter several safety related issues on a daily basis.

The forklift is among one of the most dangerous pieces of equipment a laboratory staff can operate. The possibility of injury to the driver or a spectator can occur without the proper training and precautions. Forklifts should have warning lights that blink or rotate, a backup alarm, an emergency brake, and various other safety options. Newer forklifts should come with these safety features and older ones may need to be modified to include some of those features to help protect coworkers and customers who may be assisting the driver. The forks are dangerous and should be lowered while in motion. Always drive with the view unobstructed by lowering the forks in order to see where you are going. Remember to shut off the propane tank for forklifts that use that type of fuel. I would also point out that the pallet jack, whether automated or manual, can also be very dangerous, especially when heavy cargo is elevated. The operator must always be in control and should be prepared to stop by dropping the cargo or pressing the brake if the load becomes unstable or if there is loss of control.

Another dangerous piece of equipment within some metrology labs is the manual or automated hoist and trolley. To help move large weights up and down and/or left and right the hoist and trolley can make moving weights a breeze. Operators must always be aware of several things: maximum weight of the hoist and trolley system, weight ratings for chains, hooks, and bolts, hoist and trolley speed, and metal fatigue. All of these factors must be addressed in order to avoid damage to the lab or equipment and, most importantly, to avoid injuries to laboratory staff.

Personal Protective Equipment (PPE) is crucial for all laboratories including Metrology. I believe one of the most important pieces of PPE for metrologists are mechanics gloves and protective eyewear. The padded gloves protect hands when adjusting cast iron weights. The chances are high that most metrologists have bashed a finger, knuckle, or thumb when trying to open or close a cast iron weight. Protective eyewear is for small pieces of metal that may act as shrapnel when banging on the cast iron weight or the steel rod used to help seal the weight. Steel toe boots or shoes are also very important to protect your feet from falling weights or other items that may be dropped in the lab. They also help with slipping or falls if they have specially designed antiskid tread on them. Steel toe boots or shoes are one of the required clothing when attending any NIST metrology training. Protective gloves are used to protect the weights from any contaminants on our hands and to protect our hands from any contaminants that may be

present on the weights or the metal provers. Other safety PPE apparel include hard hats, earplugs or noise cancelling headphones, and high Vis safety vests.

Finally on this list is ergonomics. Ergonomics help us stay safe by keeping us comfortable while working. Items like adjustable office chairs, tables, and desks are important while working at your desk. More important within a metrology lab are items like the automated lifting arm, which assists in lifting and maneuvering up to 150 lb weights. When pallets of 50 lb weights come in to the lab it is nice to have a piece of equipment like this around to reduce the chances of dropping the weight, pulling a muscle, or injuring your back. Another handy tool to have in any metrology lab is a 5-gallon test measure dump station with sink. This handy tool helps alleviate lab staff from having to lift the heavy water filled 5 gallon test measures onto a countertop in order to read the scale plate or lift the test measure to drain it. The empty test measure is placed on a cradle at about chest height and filled from above. Once the reading and temperature is taken, the cradle rocks back and the test measure is drained into the sink making for an incredibly easy and efficient test. Other safety items in the lab include safety railings for any staircase and raised platforms where large provers may be sitting, ladder cages to prevent falls from mounted ladders, and signage. Signs help make us aware of the many dangers present within any facility.

While this may not exhaustive list, it is important to keep all of these items in mind when entering a metrology lab and any other facility. Remember your training, take your time, and follow any protocols a lab or facility may have to keep you, your employees, and your customers safe.