POWERFUL TRADITION ELECTRIFYING FUTURE

OREGON PACIFIC-CASCADE CHAPTER

Safety Meeting Packet

May 2024

1040 Gateway Loop, Suite A ◆ Springfield, OR 97477

541-736-1443 Office ◆ 541-736-1449 Fax

2024 LABOR HOURS RECAP
ALL SIGNATORY CONTRACTORS

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
280	Inside	276,719	3	92,240	74,012	101,934	100,773									
280	Inside Appr.	74,677	3	24,892	18,960	26,703	29,014									
280	MAI	0	0	#DIV/0!	0	0	0									
280	Material	18,592	3	6,197	5,609	6,660	6,323									
280	Residential	28,508	3	9,503	6,746	12,107	9,655									
280	Resi. Appr.	14,120	3	4,707	3,512	5,006	5,602									
280	S & C	49,699	3	16,566	13,307	17,510	18,882									
280	S & C Appr.	13,691	3	4,564	3,633	4,927	5,131									
280	Support Tech/MOU	21,758	3	7,253	5,417	7,965	8,376									
	TOTAL 280	**497,764**	3	**165,921**	**131,196**	**182,812**	**183,756**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**437,957**	3	**145,986**	**114,608**	**160,181**	**163,168**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**87.98%**	3		**87.36%**	**87.62%**	**88.80%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
659	Inside	54,846	3	18,282	14,003	19,007	21,836									
659	Inside Appr.	21,407	3	7,136	5,743	6,772	8,892									
659	Material	1,243	3	414	300	378	565									
659	Residential	830	3	277	381	392	57									
659	Resi. Appr.	1,089	3	363	366	332	391									
659	S & C	2,403	3	801	584	861	958									
659	S & C Appr.	0	0	#DIV/0!	0	0	0									
	Total 659	**81,818**	3	**27,273**	**21,377**	**27,742**	**32,699**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**61,855**	3	**20,618**	**15,350**	**20,963**	**25,542**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**76%**	3		**72%**	**76%**	**78%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
932	Inside	33,877	3	11,292	10,071	11,612	12,194									
932	Inside Appr.	13,496	3	4,499	3,824	4,504	5,168									
932	Residential	472	1	472	0	327	145									
932	Resi. Appr.	1,503	3	501	378	545	580									
932	S & C	2,415	3	805	455	975	985									
932	S & C Appr.	581	1	581	0	184	397									
	Total 932	**52,344**	3	**17,448**	**14,728**	**18,147**	**19,469**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**41,938**	2	**20,969**	**11,471**	**13,943**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**80%**	2		**78%**	**77%**	**#VALUE!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
			2													
	Grand Total	**631,926**	3	**210,642**	**167,301**	**228,701**	**235,924**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**#VALUE!**	2	**#VALUE!**	**141,429**	**195,087**	**#VALUE!**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**#VALUE!**			**85%**	**85%**	**#VALUE!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

2024 LABOR HOURS RECAP
NECA MEMBERS

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
280	Inside	244,490	3	81,497	64,139	91,106	89,245									
280	Inside Appr.	64,842	3	21,614	15,966	23,445	25,431									
280	MAI	0	0	#DIV/0!	0	0	0									
280	Material	16,941	3	5,647	5,160	6,095	5,686									
280	Residential	16,396	3	5,465	3,854	5,927	6,615									
280	Resi. Appr.	11,361	3	3,787	2,462	4,171	4,728									
280	S & C	48,752	3	16,251	13,048	17,217	18,487									
280	S & C Appr.	14,833	3	4,944	4,932	4,871	5,030									
280	Support Tech/MOU	20,342	3	6,781	5,047	7,349	7,946									
	Total 280	**437,957**	3	**145,986**	**114,608**	**160,181**	**163,168**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
659	Inside	42,234	3	14,078	10,417	14,765	17,052									
659	Inside Appr.	15,472	3	5,157	3,956	4,798	6,718									
659	Material	727	3	242	112	208	407									
659	Residential	709	3	236	181	219	309									
659	Resi. Appr.	310	3	103	100	112	98									
659	S & C	2,403	3	801	584	861	958									
659	S & C Appr.	0	0	#DIV/0!	0	0	0									
	Total 659	**61,855**	3	**20,618**	**15,350**	**20,963**	**25,542**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Local#	Contract Type	Annual Total	0	Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
932	Inside	27,427	3	9,142	7,733	9,157	10,537									
932	Inside Appr.	11,279	3	3,760	3,173	3,714	4,392									
932	Residential	0	0	#DIV/0!	0	0	0									
932	Resi. Appr.	483	3	161	110	160	213									
932	S & C	2,136	3	712	455	696	985									
932	S & C Appr.	613	2	307	0	216	397									
	Total 932	**41,938**	2	**20,969**	**11,471**	**13,943**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Grand Total	**541,750**	3	**187,573**	**141,429**	**195,087**	**188,710**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

NECA
OREGON PACIFIC CASCADE CHAPTER
NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

Safety Training Topics

June 2024

Boating Safety

Bonfire, Grill and Fire Pit Safety

Fall Protection

Fire Prevention

Hearing Protection

SAFETY TRAINING TOPIC

Boating Safety

Hundreds of people are killed each year in recreational boating accidents. During the summer months it is likely that you and or your colleagues will be on a recreational water-vehicle. Here are some safety tips to follow if you plan on being out on the water.

First, always check local weather conditions and forecasts before taking a boat out. If you observe darkening clouds, volatile or rough waters, changing winds or sudden drops in temperature, return to shore immediately.

Before taking a boat you must inspect the vehicle to ensure that it is safe for use. You should ensure that there is a fire extinguisher on board and enough life vests for each passenger on the boat. It is also important that more than one person on board is familiar with all aspects of the boat's handling, operations and features. In the event that the operator is injured or incapacitated in any way, it's crucial that someone else can get everyone back to shore safely.

Once on the water it is imperative to use common sense. This means always operating at a safe speed (especially in crowded areas), being alert at all times and steering clear of large vessels and watercraft that may have difficulty stopping or turning. You should also always adhere to buoys and other navigational aids.

The likelihood of being involved in a boating accident drastically increases when alcohol is involved. Avoid drinking alcohol while boating at all costs. It can be deadly, not to mention it’s illegal.

You should also be able to swim. A large part of safe boating means you can swim in the event your boat capsizes or you fall into the water. Familiarize yourself with any state laws and regulations, prior to operating a boat. Regardless of your state's requirements, it's always important to be educated. Consider taking a boating safety course, even if you are not required to do so.

Finally, you should also consider getting a free vessel safety check. The United States Coast Guard offers complimentary boat examinations to verify the presence and condition of certain safety equipment required by state and federal regulations. They'll provide a specialist to check out your boat and make helpful boating safety tips and recommendations.

REVIEW AND DISCUSSION

- Why should you have more than one person on board is familiar with all aspects of the boat's handling, operations and features?

SAFETY TRAINING TOPIC

Bonfire, Grill and Fire Pit Safety

During the summer months you are likely to use or be around bon-fires, propane and charcoal grills and fire pits. These can all be extremely dangerous if not used properly. Here are a few safety tips to follow to prevent fires and injuries from occurring.

When using any type of grill only do so outdoors. Always have them positioned away from siding, deck railings and out from under eaves or overhanging branches. Grills must be kept a safe distance from lawn games, play areas and foot traffic. As a general rule of thumb a three-foot "safe zone" around the grill should be established. When cooking, use long-handled grilling tools to provide adequate clearance from heat and flames when using the grill. You should also periodically remove grease or fat buildup in trays below the grill to prevent fires from occurring.

In the event, you are using a charcoal grill, always purchase the proper starter fluid and store out of reach of children and away from heat sources. Never add charcoal starter fluid when coals or kindling have already been ignited. Do not use any flammable or combustible liquid other than charcoal starter fluid to light the fire.

Prior to using a propane grill, check the propane cylinder hose for leaks. You can do so by using a light soap and water solution applied to the hose. This will reveal escaping propane quickly by releasing bubbles. You must replace any damaged cylinder or hose before use,

When using a fire-pit, make sure to never use flammable fluids such as gasoline, alcohol, diesel fuel, kerosene, and charcoal lighter fluid to light or relight fires. Do not burn trash, leaves, paper, cardboard, or plywood. Avoid using soft wood such as pine or cedar that likely pop and throw sparks.

If you are building a bonfire never do so in dry conditions or if the campground and area rules prohibit fires. If there is not an existing fire pit, and pits are allowed, look for a site that is at least fifteen feet away from tent walls, shrubs, trees or other flammable objects. Also beware of low-hanging branches overhead.

When you're ready to put out your, follow these guidelines:

- Allow the wood to burn completely to ash, if possible.
- Pour lots of water on the fire; drown all embers, not just the red ones.
- Stir the campfire ashes and embers with a shovel.
- Scrape the sticks and logs to remove any embers.
- Stir and make sure everything is wet and they are cold to the touch.
- If it is too hot to touch, it's too hot to leave

Finally when being around any type of fire it is a good idea to have an appropriate rated fire extinguisher in reach!

REVIEW AND DISCUSSION

- What should you do prior to using a propane grill?

SAFETY TRAINING TOPIC

Fall Protection

SOME FACTS

Fall-related accidents account for about 10% of all workplace fatalities. Nearly all of the fall accidents on record were preventable.

Ways of protecting yourself include hazard elimination, fall protection, and work procedures.

HAZARD ELIMINATION

The most effective way to deal with fall hazards is to eliminate them. For example, if you can lower a light to replace its lamp and then raise the light back up, you have eliminated the hazard.

Partial elimination is the second most effective way. For example, if you can pre- assemble items before going up in a lift or up on a ladder, you will spend less time being vulnerable to a fall.

FALL PROTECTION

You can't always eliminate a fall hazard, and partial elimination still leaves you with a hazard. Fall protection, as defined by the fall protection industry, is a passive way of preventing you from falling.

Fall protection examples are all around you. These include ladder cages, platform railings, and secured hole covers.

FALL RESTRAINT

This is what most people think of, when they think of fall protection.

It involves the use of a secure anchorage and a lanyard connected to your full body harness. The lanyard allows you to reach the work area, but prevents you from falling too far.

Fall restraints require you to have training in the proper use and inspection of your equipment.

WORK PROCEDURES

Some situations make fall protection and fall restraint measures impractical or impossible.

The idea of changing the work procedure is not to find a cheaper way of protecting against the fall. The idea is to rethink the work process so fall protection measures become practical, possible, or unnecessary.

You may need to help change the procedure or find a way to eliminate the task completely. Your input is valuable, as you are the one doing the work.

SAFETY HARNESS INSPECTION

When using fall restraint devices, you must inspect them. Look for fiber dan1age, pulled stitches, or frayed edges. Examine D-rings, grommets, rivets, buckles, tongues, and straps.

LANYARD INSPECTION

Look for fiber damage, pulled stitches, or frayed edges. Inspect the snaphooks, carbineer, and any other mechanisms.

If it is a retractable lanyard, ensure the back nuts and rivets are tight.

If it is a retractable lanyard, test for smooth operation and proper locking.

ANCHORAGE POINTS

Before attaching to an anchorage point, look for cracks, sharp edges, or evidence of abuse.

In a particularly dangerous area, you will need to attach to a new anchorage point before un-attaching from the one you are attached to.

Do not attach to guardrails, C-clamps, ladders, conduit, light fixtures, rebar, plumbing, roof stack, or any object that you aren't sure can support your weight plus the force of your fall. Anchorage points must be capable of supporting 5,000 pounds per person because of the forces generated from the impact of a fall.

REVIEW AND DISCUSSION

- If there are ten people in your crew, how many are statistically likely to die from a preventable fall accident?
- What are three ways of protecting yourself from falls?
- What are some examples of how might you eliminate or partially eliminate a fall hazard?
- What is fall protection, as defined by the fall protection industry, and what are some examples?
- What is fall restraint, and what are some examples?
- What kind of training do you need if you are going to use fall restraint equipment?
- What is the purpose of changing work procedures?
- How do you inspect a harness?
- How do you inspect a lanyard?
- What do you need to know about attachment points?

SAFETY TRAINING TOPIC

Fire Prevention

FACTS AND FIGURES

Workplace fires and explosions kill more than 200 workers each year and injure another 5,000.

21.5% of industrial fires are from electrical causes.

Smoking causes 17% of industrial fires, while cutting and welding cause 5.5%.

PREVENTION STEPS

Use the proper circuit protection on equipment. Never bypass protection "just this once." Temporary bypasses are easily forgotten and are too dangerous even when they are not forgotten.

Smoking is the number two cause of industrial fires. It is the number one cause of premature baldness and male impotence. It is a leading cause of cancers of the bones, bladder, testicles, bowels, brain, tongue, and lungs. It is a leading cause of heart attacks, emphysema, and other illnesses. Think about this when you decide to light up. If you light up in the workplace, you endanger everyone.

To reduce the fire danger from smoking, smoke only in approved areas and use the ashtrays provided. A carelessly flicked ash or tossed butt can easily roll under an ignitable and cause a fire. It is also easy to ignite a trail of fuel fumes, which can then ignite the fuel from a considerable distance.

Pick up all food wrappers, beverage containers, napkins, and other disposable items used at meals and breaks. Dispose of them properly to prevent attracting rodents and insects.

Clean up any oil, fibers, or dust on or around equipment and machinery.

If an oil spill is too big to clean up easily, report the spill to your foreman. If you must leave the area to report the oil, leave some kind of marker-an oil pig or other absorbent material is sufficient-so others can see the spill.

If fueling a portable generator or heater, use an approved fuel can and dispenser. Do not, for example, use a paper funnel when adding fuel. Try to do the refueling outside, away from ignition sources.

Store flammable and combustible materials in appropriate containers away from heat sources. For example, place touch-up paint in yellow lockers made for storing such materials.

Dispose of flammables-solvents, fuel, oil, and the like-according to established guidelines. Most likely, this will be in a container just for flammables.

Dispose of ignitables – paper, cloth, cardboard, and the like – according to established guidelines. Most likely, this will be in a regular trash container. Never leave open flames unattended.

Before using spark-producing equipment, such as a welder, ensure the work area is free of flammables.

Before using flame-producing equipment, such as a cutting torch, ensure the work area is free of ignitables.

Arsonists are a reality. Support suspicious activity to your foreman and to security.

FIRE HAPPENS

Keep fire exits and escape routes clear and well-marked.

Know the location of alarm boxes and fire extinguishers.

REVIEW AND DISCUSSION

- What is the number one cause of industrial fires?
- What are some ways to prevent electrical fires?
- What is the number two cause of industrial fires?
- What are some cautions about smoking?
- Why shouldn't you eat in electrical rooms?
- What should you do about oil leaks?
- What should you do about small oil spills? Big ones?
- What are some cautions about fueling portable equipment?
- Where should you store flammables?
- What is the difference between fire prevention and fire protection?

SAFETY TRAINING TOPIC

Hearing Protection

Hearing loss is a major preventable health problem. Damaged hearing reduces your ability to communicate on the job, and it results in social and marital problems. There is no sense in leaving yourself open to a personal loss.

Many of us assume that wearing foam ear plugs when the sign tells us to "wear hearing protection" is all we need to do to protect our ears. This isn't true. Ear plugs are just one form of ear protection, and areas with signs requiring hearing protection are just one situation where you should wear ear protection.

Many of us assume hearing protection and ear protection are the same. This isn't true. Ear protection is more inclusive than hearing protection, but ear protection equipment doesn't necessarily provide hearing protection and vice-versa.

Many of us assume hearing loss is a natural result of aging. This isn't particularly true. Hearing loss due to excessive noise is preventable.

Many of us assume we can always get a hearing aid, so hearing loss isn't important. This isn't true. Hearing aids do not provide the same quality of hearing that undamaged ears do.

Many of us assume that if we have passed a hearing test we don't need to worry about our hearing. This isn't true. Hearing tests don't catch damage until it has happened, and standard hearing tests are not comprehensive enough to catch all damage that does occur.

Wear hearing protection whenever you must raise your voice to carry on a normal conversation.

Wear hearing protection whenever you are around machinery that could start without notice and alarm systems that are likely to go off.

You should wear hearing protection whenever the noise levels exceed OSHA limits on or off the job. Damage can occur even when you are having fun. Wear hearing protection any time you operate a firearm.

Personal hearing protection includes roll-able foam plugs, molded plugs, over the ear muffs, or other devices.

Do not wear ear plugs if you are at risk for an arc blast. The concussion could drive those plugs into your ears and render you permanently deaf.

Environmental hearing protection includes noise shields, soundproofing, restricted access, and closed doors. If you find any of this hearing protection damaged or not functioning properly, report it to your foreman.

Noise isn't the only thing that can damage the inner ear. Be careful when blowing your nose. In addition to damaging your inner ear, excess pressure can rupture your nasal membrane.

REVIEW AND DISCUSSION

- What are some reasons ear protection and hearing protection are important?
- Are hearing protection and ear protection the same?
- Is hearing loss primarily a consequence of aging, or is it preventable?
- Why should you preserve your hearing?
- If you passed a hearing test, are your ear protection worries over?
- When should you wear hearing protection?
- Name some forms of personal hearing protection?
- Name some forms of environmental hearing protection?
- What are steps you can take to prevent hearing loss?

Safety|NewsAlert

Heat Stress:

Keeping Employees Safe

INJURY

Contents

370 Technology Drive
Malvern, PA 19355
610-727-0515

Heat Stress:
Keeping Employees Safe

Exposure to excessive heat is extremely dangerous for all kinds of American workers. It occurs in hot indoor work like foundries, glass factories, confined spaces, construction, food processing, laundries, warehouses and other areas and in all outdoor work. Heat stress can lead to heat-related illnesses, ranging from minor heat cramps or skin rashes to heat exhaustion, which is more serious and can in turn cause heat stroke. Heat stroke can quickly become fatal if emergency medical attention is not provided immediately.

A total of 423 fatalities were recorded by the Bureau of Labor Statistics (BLS) in outdoor work during the period between 1992 and 2006, which was a fatality rate of 0.16 per 100,000 workers. That's nearly 20 times greater than the fatality rate for the average U.S. civilian worker. Conclusion: Working in high heat and humidity is extremely dangerous.

Complicating efforts to combat illnesses and fatalities due to heat exhaustion and heat stroke is the fact that the symptoms of the onset of heat exhaustion are often not adequately recognized by employers and supervisors or the employees themselves and their co-workers.

The regulatory environment

One of the problems is that not much guidance is available from official sources. There is no federal mandatory standard by the Occupational Safety and Health Administration (OSHA) compelling employers to observe certain specific work practices to safeguard their employees against heat stroke. OSHA has pointed all employers who ask about heat stress to a 15-page booklet published by the National Institute for Occupational Safety and Health (NIOSH) entitled "Standards for Occupational Exposures to Hot Environments" (available for free by writing to NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226, or requesting it via the Web, www.cdc.gov/niosh).

And OSHA warns employers the so-called General Duty Clause will

370 Technology Drive
Malvern, PA 19355
610-727-0515

apply to employers' obligations to protect their workforces. That's the clause that obligates employers in a general sense to provide a working environment free of known hazards and carries some of the heaviest penalties OSHA can levy. If it can be proven an employer knew of a hazard that workers were exposed to, and didn't do anything to mitigate or control the exposure, that can be held to be a violation of the general duty clause (GDC). This rule has often been used in cases where no specific standards apply.

For example: A Connecticut worker was hospitalized for over a week with kidney failure after he passed out while removing asbestos from a gutted building in sweltering heat. OSHA cited Shabbaz Services Enterprise of Hartford for one serious violation, carrying a penalty of $2,800, for failure to implement a heat illness prevention program.

Another example: A Georgia water services company was cited by OSHA after a worker welding in heavy PPE was hospitalized with heat exhaustion. The employee was taken to the hospital after working in direct sunlight and wearing required protective clothing during welding and fabrication work. The heat index ranged between 83 and 88 degrees. The company paid $21,000 in fines.

But quite often, OSHA's efforts to cite companies for heat stress injuries and fatalities backfires. Case in point: OSHA cited A.H. Sturgill Roofing after a 60-year-old temporary employee died from what appeared to be heat exhaustion while working on a flat roof.

The employee, who was later found to have hepatitis C and congestive heart failure, was working in temperatures of about 82 degrees Fahrenheit. He collapsed and was taken to the hospital where he was found to have a core temperature of 105.4 degrees Fahrenheit. He died three weeks later.

Prior to the worker's collapse, a Sturgill foreman spoke to the crew of 11 employees, telling them to take plenty of breaks and drink lots of water, which the company supplied. The temporary employee who collapsed and died had been assigned to a light duty job to acclimate him to working in the heat.

Despite those efforts at protecting employees from heat hazards, OSHA cited Sturgill under the GDC, saying the company didn't provide its

370 Technology Drive
Malvern, PA 19355
610-727-0515

employees with a place of employment free from heat-related illness. Sturgill appealed and the Occupational Safety and Health Review Commission reversed the decision, saying OSHA failed to prove the existence of a hazard or a feasible means of abatement for the company.

Some states took action in absence of federal rule

At least three states – California, Washington and Minnesota — have gone beyond the federal requirements and enacted their own state-specific heat stress rules. California first put out its regulation as an emergency rule in 2005, amended it in 2006, again on an emergency basis, and has since made the rule permanent.

The California rule (California Code of Regulations, Title 8, Section 3395, heat illness prevention) applies to all outdoor places of employment, and makes it mandatory for all employers with outside workers to institute and document extensive training programs for all employees, which include:

a) environmental and personal risk factors for heat illness

b) employer procedures for protecting employees from heat stress

c) the importance of frequent consumption of small quantities of water, up to 4 cups per hour (to be provided by the employer) when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties

d) the importance of acclimatization, in other words, going from moderate to hot environments, either because of the sudden onset of hot weather or because of transitions from air-conditioned to hot outdoor environments

e) common signs and symptoms of different types of heat illnesses

f) the importance of reporting signs of heat illness in themselves or co-workers immediately to supervisors

g) employer procedures for responding to possible symptoms of heat illness, including specifics on how emergency medical services will be provided if needed

h) employer procedures for contacting emergency medical services and

370 Technology Drive
Malvern, PA 19355
610-727-0515

for transporting affected employees to a point where they can be reached by emergency personnel, and

i) employer procedures for providing clear and precise instructions to emergency personnel where affected workers can be found.

Under the California regulation, all supervisors must also be trained in two additional areas:

a) Supervisor procedures for implementing an employer heat stress program, and

b) Supervisor duties when an employee exhibits possible symptoms of heat illness, including emergency response procedures.

In March 2009, Cal-OSHA issued guidelines for how and when shade and water must be provided to outdoor workers:

a) Where unlimited drinking water is not immediately available via plumbing, the employer must provide enough water for every employee to be able to drink one quart of water, or four 8-ounce cups, per hour.

b) If an employer chooses not to provide the full-shift quantity of drinking water at the start of a work shift, the standard requires effective procedures for drinking-water replenishment to allow each employee to drink one quart per hour.

c) Water must always be readily accessible. Employers should build their water placement strategies around the fact that the more an employee has to interrupt work to drink, the greater the likelihood the employee will not drink enough water to fully protect against heat illness. An employer may choose to augment a readily accessible water supply by providing a beverage container (preferably insulated to keep the water cool) to be carried and used by the employee while working.

d) When temperatures exceed 90 degrees F, having ice on hand to cool the water is recommended.

e) Shade is required when the outdoor dry-bulb temperature high for the location where employees will work is forecast, as of 5 p.m. the previous day, to be over 85 degrees F, according to the National

370 Technology Drive
Malvern, PA 19355
610-727-0515

Weather Service. Shade must be up at the beginning of the shift and present throughout.

f) Regardless of what the predicted high is, employers are expected to know if the actual temperature is exceeding 90 degrees F at their worksite. If the temperature enters this range, shade must be present regardless of the predicted high.

g) Cal-OSHA requires enough shade to accommodate 25% of the employees on a shift so they can sit comfortably without touching each other. However, if more than 25% of a shift's workers require shade at the same time, the employer must provide it immediately.

h) Shade must be located less than a 1⁄4-mile or five-minute walk away, whichever is shorter.

California has continued to increase employer obligations to protect workers from heat stress and illness.

A series of Cal-OSHA regs beginning in 2013 mandated that all employers with outdoor places of employment implement a heat stress and heat stroke prevention program that includes providing workers with 5-minute cool-down rest breaks in the shade, every hour. Workers cannot do any form of work during these 5-minute breaks.

Since Jan. 1, 2015, in California, all cooldown periods or "recovery periods" must be paid under state law.

Cal-OSHA has posted a Q&A on its Web site about enforcement of the heat illness regulation at http://www.dir.ca.gov/DOSH/heatillnessQA.html.

The regulation in the State of Washington imposes very similar obligations of employers. The Washington rule was based in part on a separate study of heat-related illness claims in the Workers' Compensation State Fund. It found that three other factors contributed significantly to the incidence of heat-related illnesses:

1. Medication use by workers (Action Step: Ask them what medications they're on.)

2. Co-morbid medical conditions (Action Step: Have an occupational health nurse check if they're in good physical condition and not suffering from any other illnesses; be careful if they're on a

370 Technology Drive
Malvern, PA 19355
610-727-0515

weight-loss program or a low-salt diet – that makes them more susceptible to heat-related illnesses. Be alert to signs of alcohol or drug abuse – it greatly increases risk factors as well.), and

3. Poor acclimatization for the physical demands of work in hot environments (Action Step: For people coming from different climates, let them ramp up slowly.)

The Minnesota heat stress standard finalized by Minnesota OSHA in 1997 provides guidance for employers on proper hydration. The most important factor in preventing heat illnesses is adequate water intake because:

Thirst is not an adequate indicator. Relying on thirst will result in dehydration.

Once the body becomes dehydrated, it is more difficult to rehydrate because the gut does not absorb water as well. Adequate water intake throughout the day is necessary.

Workers should drink at least five to seven ounces of cool water every 15-20 minutes.

Under conditions of profuse sweating, a commercial electrolyte replacement drink may be appropriate. Some drinks are too concentrated and need to be diluted or consumed along with water.

Salt tablets are to be avoided. Salt tablets irritate the stomach and can lead to vomiting, which results in further dehydration.

Say it in Spanish, too

Since training can only be considered to be effective when it is understood by all trainees, and since a high proportion of foreign-born workers is present in outdoor work, especially among agricultural crop workers, training and communication regarding the risk for heat-related illnesses should be provided in the workers' native language.

Heat-related safety educational materials are available in English and Spanish from several different sources, including the California Division of Occupational Safety and Health (*www.dir.ca.gov/dosh/heatillnessinfo.html*) and/or the North Carolina Department of Labor (*www.nclabor.com/pubs.htm*).

370 Technology Drive
Malvern, PA 19355
610-727-0515

A 7-point prevention program

The Centers for Disease Control and Prevention (CDC) has recommended all agricultural employers develop and implement a seven-point heat stress management plan. Many of the recommendations are included in the mandatory California rule.

Here are the seven recommendations:

1. Train for field supervisors and employees to prevent, recognize and treat all types of heat-related illnesses
2. Implement a heat acclimatization program
3. Encourage proper hydration with the right amounts and types of fluids (plain water is best; sugar- or caffeine-containing sodas do not offer enough protection and energy drinks may provide a temporary boost but can have negative effects later)
4. Establish work/rest schedules appropriate for current heat indices (the onus is on the employer and the supervisors to determine what is appropriate under the circumstances)
5. Ensure access to shade or cooling areas
6. Monitor the environment and the workers during hot conditions, and
7. Provide prompt medical attention to workers who show signs of heat illness.

What happens to the body?

In hot conditions, the human body shows a number of physiological responses. The body starts to sweat, the body temperature goes up and the heart beats faster. At a body temperature of over 103 degrees, heat stress sets in, characterized by red, hot and dry skin with no sweating; a rapid, strong pulse; a throbbing headache; dizziness and nausea; confusion, and finally unconsciousness and eventually death.

Heat stroke has a spiraling effect. Once the central nervous system has been affected, it gets progressively worse. At that point, just getting an affected worker to the shade will not help enough anymore; he or she will need immediate medical attention. The conditions can move

370 Technology Drive
Malvern, PA 19355
610-727-0515

progressively from mild nausea to fainting literally in a matter of minutes, and death could result in a matter of hours if no emergency medical assistance is available.

Supervisors would do well to pay particular attention to workers who already exhibited the signs of early stages of heat stress once before.

Heat-related illnesses are not like childhood diseases in that people develop some sort of immunity to them once they've had them once. Rather, the opposite is true. Once people have had an incident, they are more likely to have another and exhibit greater susceptibility to heat-related illnesses.

The importance of acclimatization

The human body has limited capacity to rapidly acclimatize to different conditions. On the more basic level, someone not used to hard field work will likely have a tough time getting acclimatized to eight hours of hard manual labor under the hot sun and can only gradually work up to that level of effort. But particular attention should also be paid to people coming out of a long air-conditioned bus ride into a hot environment.

And not all foreign-born workers with darker skins can be automatically assumed to be used to working in hot weather. The most densely populated areas of Mexico and most Central American countries, as well as the Andean nations of South America, where most of the people live, are in the highlands with cool or moderate climates where maximum daily temperatures rarely even hit 80 degrees.

Particular attention should also be paid to spring weather when temperatures can suddenly spike from around 70 degrees to over 90 degrees. Even the most hardened field hands will have trouble adjusting to such increases in temperatures. Scientific studies have shown it takes the human body at least three days, and probably five, to adapt to such changing conditions, so particular attention should be paid to worker health during those periods.

When people return from vacation, also pay particular attention to acclimatization. As a general good safety practice, reduce expectations during periods of acclimatization. Once people are acclimatized to hotter conditions, their tolerance to heat stress increases, and they see a

370 Technology Drive
Malvern, PA 19355
610-727-0515

reduced physiological strain on their bodies.

The job risk factors

The three job risk factors causing heat stress are:

1. A hot environment

This can occur indoors or outdoors. Working near hot surfaces in many indoor occupations can be just as dangerous from the point of view of heat stress as outdoor work in the hot sun – especially if certain personal protective equipment (PPE) needs to be worn for other safety reasons. Hot surfaces result in an increased rate of radiant heat into the work environment and can be found in a large variety of workplaces such as bakeries, foundries, glass factories, welding shops, laundries, dry cleaners and many others. Most machinery, even in light industrial settings, generates varying degrees of heat.

When it comes to outdoor heat, the outside temperature isn't the only factor to be considered. Is there a wind blowing to bring a cool breeze? Or is the wind so hot that it brings an increased rate of convective heat as well? But apart from air temperature and air speed, probably the most important factor to consider is the humidity. Supervisors would do well to check the Weather Channel or the WeatherNation TV on TV or on the Web (*www.weather.com* or *www.weather.gov*) in the morning for dew point temperatures prior to a day's shift. High dew points indicating high humidity are the greatest indicators of the risk for heat stress.

2. Hard work

Workers' bodies adjust to the need for physically demanding labor, whatever the type of work it may be, by converting chemical energy stored inside the body into mechanical energy. Inherent in that process is the generation of a great deal of internal heat. That heat needs to be dissipated into the environment, through sweating, cooling, etc. That's the physiological explanation for the fact that people sweat when they have to do physically demanding work. Professional athletes are good examples. When hard work must be combined with hot environments – and perhaps also with the need to wear protective clothing that makes it feel even hotter – the risk factors go up dramatically.

370 Technology Drive
Malvern, PA 19355
610-727-0515

3. Protective clothing

Certain types of clothing, although they may be necessary to protect workers from other hazards, can make workers feel even hotter. Insulation clothing, which "insulates" the worker from other hazards, affects the rate of heat transfer by convection and radiation. Ideally, if other conditions permit, to reduce the potential for heat stress, clothing should have some degree of permeability, to allow cooling by sweat evaporation, and/or ventilation. The rate of cooling is affected by sweat evaporation as air moves around and through the clothing. Risk factors for heat stress may have to be adjusted upward, depending on what type of clothing, especially personal protective equipment, can or must be worn in the workplace. Clothing that inhibits sweat evaporation is an increased risk factor.

How to recognize the onset of heat stress

Uncompensable heat stress occurs when the human body is unable compensate for the amount of heat generated through a combination of physically hard work, a hot environment and clothing that allows little or no ventilation or evaporation.

The first signs are obvious and involve copious sweating, not just under the armpits but sweating of the kind that soaks the entire back of a worker's shirt. Symptoms may also include an increase in accidents and injuries, including ergonomic injuries, a natural decrease in the quality and quantity of work and effort, excessive thirst, workers fidgeting and frequently adjusting their clothing, low morale and increased irritability. That's when wrenches can start flying for little or no reason. If absenteeism is the result, this can cause more forced overtime for the remaining workers, which in turn probably makes the problem even worse. That's why it's important to spot the first signs of heat stress, get the right help for affected workers and prevent a potentially bad situation from escalating.

Particular attention should be paid to so-called "team environments." Normally, supervisors like people who work in teams, perhaps to achieve team bonuses or incentives for getting a certain amount of work done or the absence of injuries among the team. When workers feel the team spirit, general productivity and morale are higher, and people watch out

370 Technology Drive
Malvern, PA 19355
610-727-0515

for each other, pulling up laggards where necessary.

However, such a team environment can be particularly dangerous when it comes to heat stress. Members of the team who may start to feel the onset of heat stress are reluctant to speak up, rest, seek shade or adjust work pace for fear of letting the team down. They keep on working for fear of being labeled a "wimp" until it's too late. Supervisors ought to pay particular attention to workers in team environments to ensure no member of any team feels compelled to do more than he or she is capable of at the time "for the sake of the team." Workers in individual settings are much more likely to pace themselves and report symptoms of discomfort sooner.

Checklists for supervisors

There are two easy-to-use checklists for supervisors, even those who aren't safety experts, to determine whether undue exposure to heat is likely to be a problem in their workplaces for their work crews.

The first one, probably the easiest to use, was developed by one of the country's foremost experts in heat stress, Thomas Bernard, a professor at the University of South Florida's College of Public Health in Tampa.

This checklist includes the following potential heat stress situations:

- Obvious sweating
- Environment perceived to be warm (don't just go by your own observations – ask the workers, too)
- Worker requires a break at least every two hours
- Wearing regular work clothes (as opposed to special PPE) would be more comfortable
- There are reports of fatigue, weakness, loss of coordination, dizziness, headaches, nausea, cramps and/or heat exhaustion
- Absenteeism, employee irritability or worsening employee relations can be associated with these work conditions, and
- Increases in accidents and injuries and/or decreases in production and quality can be associated with these work conditions.

370 Technology Drive
Malvern, PA 19355
610-727-0515

A “yes’ to the presence of any of these job factors would indicate a further investigation is warranted and some form of control measures would probably be appropriate.

Another checklist: Assessing the degrees of danger

Another way to assess heat stress risk, from the Annals of Occupational Hygiene, is a little more detailed and considers not only the seven principal factors, but also the degree to which they can be dangerous.

Here are the seven risk factors to be considered:

- air temperature
- humidity
- thermal radiation
- air movement
- work load
- clothing, and
- worker opinion.

For each of these seven factors, there is an “ideal” zone for “normal” scores, and there are danger zones on both sides – too hot or too cold. For example:

Air temperature:

- Ideal zone between 50 and 77 degrees Fahrenheit.
- Anything colder or hotter starts presenting some problems.
- A temperature over 104 degrees represents an extreme danger.

Humidity:

- Ideal zone represented by normal or slightly moist skin.
- Dry throat and/or eyes after 2-3 hours are signs of a low danger zone.
- Completely wet skin is evidence of a high-humidity danger zone.

370 Technology Drive
Malvern, PA 19355
610-727-0515

Thermal radiation:

- The ideal zone is no discernible radiation felt on face.
- Face feels only slightly warm after 2-3 minutes indicates a low danger zone.
- Unbearable heat on face after more than 2 minutes or immediate burning sensation represent the high danger zones.

Air movement:

- Cold, light air movement, or no noticeable air movement at all are ideal.
- A warm, light air movement is only a low danger.
- On either side of the scale a strong cold air movement or a strong hot air movement are high danger zones.

Work load:

- The ideal zone is either office work, work with low muscular contractions, or work with moderate arms and trunk movement, steady walking or the use of heavy machinery with a great degree of automation.
- The first danger zone lies in handling heavy objects, intense use of arms and trunk, shoveling or carrying heavy loads.
- The most intense danger zone lies in very intense work at high speed or climbing stairs or ladders.

Clothing:

- The ideal zone, where no danger is present, is in light, flexible clothing with no or only slight interference with work movements.
- Clumsy, heavy, specially designed barriers for radiation, water vapors or cold are the moderate danger zone.
- Special coveralls with gloves, hoods and shoes represent an even higher degree of risk.

370 Technology Drive
Malvern, PA 19355
610-727-0515

Worker opinion:

- No thermal discomfort, a slight cool discomfort or a slight sweating discomfort with moderate thirst are all within the ideal zone.
- Shivering and overall sensation of coolness are in a moderate negative danger zone.
- Heavy and excessive sweating, strong thirst and modified work pace are all signs of high risk for heat stress.

Job-specific controls

- As if it wasn't hard enough to spot and assess the risk factors for heat stress among the workforce, control of the hazard may be even more difficult.
- Controls may not always be possible because, as they say, "you can't control the weather."
- However, there are several things employers can do to minimize exposure in different areas:
  - Training
  - Medical surveillance
  - Engineering controls
  - Administrative controls, and
  - Personal protection.

Training

Workers can be trained to ensure adequate fluid replacement – drink at least 4 cups of water every hour – to minimize the possibility of heat-related illnesses. Sometimes, in certain environments, sufficient quantities of water cannot be kept near work stations because of other specific hazards. In those cases where there are restrictions on drinking, pre-task and post-task hydration should be made mandatory.

Plain water is the most important ingredient in hydration. Any type of alcoholic beverage has the effect of dehydration instead of hydration. Sugary drinks aren't ideal, either.

370 Technology Drive
Malvern, PA 19355
610-727-0515

Workers need to be trained – and supervisors need to be trained along with them – to allow for the pacing of work and the interruption of the heat stress exposure process once excessive discomfort is felt or once the earliest symptoms of a heat-related disorder are detected. This requires a considerable degree of trust between worker and supervisor. The supervisor has to trust the worker isn't faking injury; and vice versa, the worker, who may be intent on finishing the task if payments for piece work or bonuses are involved, must trust the supervisor has his or her best interests at heart when the supervisor tells the worker to take a break and get to the shade.

Educating workers on appropriate diet and lifestyle may also be important in prevention of heat stress. Workers will be better protected and more able to prevent heat stress if they observe a well-balanced diet, perhaps with extra salt (crash diets are very dangerous), get adequate sleep, limit exposure to heat stress in other areas of their life away from work, and do not abuse drugs or alcohol.

Although lifestyle issues are an individual worker's responsibility, management can contribute to removing barriers for people to take personal responsibility for health issues. Open communication with supervisors, the availability of wellness programs, healthy snacks, sufficient quantities of good-tasting water, etc., can all help.

Most experts recommend training on how to prevent and control heat stress at least once annually, before the onset of hot weather for outdoor work, with periodic refreshers throughout the year. Such training typically includes education of the recognition of symptoms, as well as a detailed explanation of on-site countermeasures available to workers and supervisors.

Medical surveillance

Medical surveillance programs are necessary site-wide as well as individually-focused. Site-wide, supervisors should be alert to any reports of heat-related disorders such as heat exhaustion, muscle cramps, rashes or fainting, and/or worker complaints about fatigue, general feeling of weakness, loss or coordination, dizziness, headaches or nausea.

370 Technology Drive
Malvern, PA 19355
610-727-0515

Even if no worker comes forward with any such complaints, supervisors would be well advised to be alert to other signs that may be observed among the workforce, such as irritability, low morale or excessive absenteeism, decreased productivity and/or quality and increased incidence of accidents or minor injuries.

If a worker presents an acute fever, one difficulty supervisors or even trained medical personnel may have is that the fever may be due not only to heat stress, but to other conditions as well. In that case, it would be wise to consider any other possible cause of fever, such as the use of certain prescription or over-the-counter medicines taken for other conditions. The fever may also be due to the flu, upset stomach accompanied by vomiting or allergies. If a worker is likely to have the flu or a possibly contagious stomach ailment, isolate him from the rest of the working population to prevent contagion.

Special Tip: Here's a special tip for supervisors and emergency responders. To determine whether someone is already suffering from heat stroke and whether the body temperature has shot up to at least 103 degrees Fahrenheit, you have to take the body temperature. There are generally two easy ways of doing this: with an oral thermometer or with a shot in the ear. Oral measurements are more accurate, but they are not always feasible, especially if the patient had become uncooperative or even belligerent because of disorientation, which often sets in with heat stress. Under those conditions, it is OK to rely on temperature measurements taken from the ear. Even though they are not as accurate, they usually show up too high, never too low. Therefore, there is no risk of underestimating the danger the patient is in. It's always better to over-react than to think everything is OK.

Always mention to doctors, nurses or emergency medical technicians the conditions observed may be due to heat stress, at the very least as a contributing factor, so they test for it before a patient's condition deteriorates rapidly.

On an individual basis, companies would be well-advised to submit all prospective employees who may be exposed to hot conditions to pre-placement physicals. For their own protection, many companies ask for doctors' written opinions – just in case anything happens later. Those

370 Technology Drive
Malvern, PA 19355
610-727-0515

pre-placement physicals, in best-practice operations, are followed up by periodic physical exams if the work in hot conditions will last for some length of time.

Additionally, throughout their course of employment in hot conditions, supervisors would do well to monitor each individual worker on their crews for excessive accidents, absenteeism or chronic fatigue, which all may be due to the onset of heat stress.

Engineering controls

Sometimes there's not much that can be done with engineering controls to limit any heat exposure, but good companies and supervisors always look for whatever can be done in this regard.

The greatest contributor to the reduction of heat exposure and heat stress would be to reduce the metabolic rate of the worker's body, by whatever means can be achieved. Sometimes the work pace can be slowed through mechanical adjustments in cases where workers have to keep up with equipment, such as harvesting machinery.

Of the least value (but they may help just a little) are measures to increase air motion, in other words put a mechanical fan near the affected workers to make them feel a little breeze.

Sometimes clothing requirements may be changed, to make it possible for workers to don different gear that allows them to cool off through sweat evaporation, or to catch a breeze in, through or around their clothing. In some cases, tradeoffs may have to be made between optional PPE (if the need and the hazard isn't that great) and more comfortable clothing.

No one can control the weather outside, but for hot indoor work it may be possible to reduce the temperature, and especially the humidity, by making adjustments to an HVAC or cooling system.

And finally, if a piece of machinery or equipment is the culprit for generating the heat to which workers are exposed, talk to the maintenance engineers to see if anything can be done to limit the source of the radiant heat, either by reducing it outright or diverting the radiation in a direction away from workers.

370 Technology Drive
Malvern, PA 19355
610-727-0515

Administrative controls

The risk of undue exposure to heat stress can often be controlled with administrative measures. These include putting a time limit on continuous work in hot conditions, or increasing the frequency of rest breaks in the shade to allow workers to recover sufficiently between work cycles. Other types of scheduling can also work, such as starting shifts earlier in the day at the crack of or even before dawn (or in the evening after the sun has gone down if artificial lighting can be provided). It's all about keeping workers out of the sun during the hottest part of the day.

In an environment of trust between workers and supervisors, many companies allow workers potentially exposed to hot conditions a considerable amount of self-determination on the job. They let them set their own pace of work to limit exposures.

Other companies have had good results with a so-called "buddy system," in which they assign two or more workers to watch out for each other, and report the first signs of slowdowns that may be due to the onset of heat stress.

Administrative controls rely on human factors and are only as good as the human beings administering them, but they can be very important in the prevention of heat-related illnesses. Another advantage of the administrative measures is they are often the most easily implemented.

Personal protective equipment

While some types of personal protective equipment (PPE) may actually contribute to heat-related illnesses, other types of personal protection may be effective in providing a micro-climate for the worker to promote cooling, or least reduce further heat gain.

Such methods can include individual circulating air systems around a particularly hot work station, or a liquid cooling system in the same area for the same purpose.

Other possible solutions may include ice-cooling or evaporative cooling garments.

And finally, to combat sources of radiant heat for either outdoor or

370 Technology Drive
Malvern, PA 19355
610-727-0515

indoor work, certain types of reflective clothing can be effective. Above a certain limit of the radiant heat source, such reflective clothing may be required as PPE, not just advisable.

And remember, according to OSHA's new revised PPE rule, the employer must pay for virtually all required PPE. The limited exceptions (such as work boots which can be worn off the job as well) do not apply to any PPE necessary to reduce heat exposure.

What does a good safety program against heat stress look like?

Any good safety and health program to effectively limit the possibility of heat-related illnesses in employees consists of six elements:

1. Policy

It's probably a good idea for companies that have workers exposed to potentially excessive heat to issue and publicize a policy statement recognizing that heat stress is a potential hazard, and that a heat stress program is an integral part of the company's overall safety and health program. Such a policy statement ideally also outlines that safety and/or industrial hygiene resources are available from the company to assist production personnel.

2. Responsibility

A good heat stress program assigns specific responsibilities: Production managers are ultimately responsible for the implementation of the policy and the program, but they may exercise some delegation of authority to supervisors once they've established the supervisors know what to do. This is logical for outdoor work. Only the supervisors are with their workers all the time, and production managers cannot be in all places at the same time. First-line supervisors are the day-to-day role model of the observance of specific policies and have the responsibility to assure compliance at the worker level. As for employees, they should all be required to comply with the guidelines (with consequences for non-compliance) and practice good heat stress hygiene.

370 Technology Drive
Malvern, PA 19355
610-727-0515

3. General controls

As described above, a number of general controls may be available to companies to reduce exposures, ranging from medical surveillance to engineering controls to modified work practices and personal protective clothing.

4. Specific controls

Each worker is likely to react differently to extremely hot conditions. Therefore, supervisors must try to keep an eye on each worker. If that's impossible, try the "buddy system" to have workers watch out for each other.

5. Monitoring

No safety program can be complete without constant monitoring – otherwise any policy isn't worth the paper it's written on.

6. Review and evaluation

Any good safety program always needs to be evaluated and reviewed for its effectiveness. Good companies always ask themselves: What can be done better next season? And they hopefully do it even before an accident or an injury occurs.

370 Technology Drive
Malvern, PA 19355
610-727-0515

Safety | NewsAlert

Access our helpful tools, articles
and other Essential Insights at
www.safetynewsalert.com