STEVE SISOLAK
Governor

TERRY REYNOLDS
Director

STATE OF NEVADA

VICTORIA CARREÓN
Administrator

PERRY FAIGIN
Deputy Administrator

WILLIAM GARDNER
Chief Administrative Officer

DEPARTMENT OF BUSINESS AND INDUSTRY
DIVISION OF INDUSTRIAL RELATIONS
OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

Date: **February 28, 2022**

To: **Stakeholders**

From: **William Gardner, Chief Administrative Officer**

RE: **Draft Heat Illness Regulation: Answers to stakeholder questions**

Nevada OSHA is developing a regulation to address heat illness (R053-20). The attached draft regulation reflects input from informal stakeholder meetings held on January 7, 2022, and February 2, 2022. Answers to common questions raised during these stakeholder meetings are provided below:

Q1. Why does Nevada need a heat illness regulation?

Current Data

Nevada initiated the regulation process on May 1, 2020, due to a perceived need to protect workers exposed to hazardous heat. The following data was evaluated preceding the decision to initiate the rulemaking process:

Nevada Heat Prostration Workers' Compensation Claims							
	FY 2018	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022 (Half year)**	**TOTAL**	**Average Per Year (FY2018-FY 2021)**
Accepted	**48**	**43**	**48**	**49**	**34**	**222**	**47**
Denied	**30**	**26**	**27**	**20**	**14**	**117**	**26**
Total	**78**	**69**	**75**	**69**	**48**	**339**	**73**

Heat Stress Complaints								
	2016	**2017***	**2018***	**2019***	**2020***	**2021***	**TOTAL**	**Average Per Year**
Southern NV	**69**	**130**	**81**	**62**	**115**	**159**	**547**	**109**
Northern NV	**5**	**12**	**21**	**19**	**20**	**43**	**115**	**23**
Total	**74**	**142**	**102**	**81**	**135**	**202**	**662**	**133**

***Denotes numbers have been adjusted following further review of data.**

While Workers' Compensation trends have remained relatively consistent throughout the approximately 4-year period, heat stress complaints over a 6-year period made to Nevada OSHA have notably risen consisting of both indoor and outdoor activities.

Nevada Complaint Information by Industry NAICS

A review was performed of heat illness complaints provided to Nevada OSHA over a 6-year period. A summary by NAICS is provided below. Of note from this review was that most of the complaints came from indoor workplaces. Specifically, Casino Hotels, Full-Service Restaurants, and Limited-Service Restaurants were 26% (175) of the total complaints over the 6-year review period.

NAICS	Industry	5-Year Total	Percent of 5-Year Total
21xxxx	Mining	2	0.30%
22xxxx	Utilities	3	0.45%
23xxxx	Construction	30	4.53%
31-33xxxx	Manufacturing	46	6.95%
42xxxx	Wholesale Trade	12	1.81%
44-45xxxx	Retail Trade	124	18.73%
48-49xxxx	Transportation and Warehousing	49	7.40%
51xxxx	Information	6	0.91%
52xxxx	Finance and Insurance	6	0.91%
53xxxx	Real Estate Rental and Leasing	11	1.66%
54xxxx	Professional, Scientific, and Technical Services	6	0.91%
56xxxx	Administration and Support and Waste Management and Remediation Services	37	5.59%
61xxxx	Educational Services	21	3.17%
62xxxx	Health Care and Social Assistance	18	2.72%
71xxxx	Arts, Entertainment, and Recreation	25	3.78%
72xxxx	Accommodation and Food Services	202	30.51%
81xxxx	Other Services (except Public Administration	45	6.80%
92xxxx	Public Administration	21	3.17%

Other industries of note were the following:

- Supermarkets and other Grocery Stores (445110) – 14
- Discount Department Stores (452112) – 11
- Used Merchandise Stores (453310) – 14
- General Warehousing and Storage (493110) – 21
- Security Guard and Patrol Services (561612) – 14
- Elementary and Secondary Schools (611110) – 18
- General Automotive Repair (811111) – 12
- Industrial Launderers (812332) – 10

Bureau of Labor Statistics Data

According to the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries, exposure to excessive environmental heat stress has killed 907 U.S. workers from 1992-2019, with an average of 32 fatalities per year during that time period. In 2019, there were 43 work-related deaths due to environmental heat exposure. A recent analysis of BLS data by National Public Radio and Columbia Journalism Investigations found that the three-year average of heat-related fatalities among U.S.

workers has doubled since the early 1990s. The BLS Annual Survey of Occupational Injuries and Illnesses estimates that 31,560 work-related heat injuries and illnesses involving days away from work have occurred from 2011-2019, with an average of 3,507 injuries and illnesses of this severity occurring per year during this period.

Nevada Fatalities Potentially Heat Related

Year	Total Potentially Heat-Related Fatalities
2016	1
2017	3
2018	0
2019	1
2020	0
2021	2

It's important to note, for the reasons mentioned below, that these numbers could be significantly higher.

Unreported/Underreported Data

In addition to the data noted above, the federal register report created as part of the rulemaking process for the federal heat illness standard notes that occupational illnesses, injuries, and fatalities due to hazardous heat are often underreported. First, the full extent of heat-related health outcomes is underreported generally because heat is not always recognized as a contributing factor and the criteria for defining a heat-related death or illness may vary by state, and among physicians, medical examiners, and coroners. Further, if the illness or injury does not require medical treatment beyond first aid, or result in restrictions or days away from work, loss of consciousness, diagnosis by a healthcare professional as a significant injury, or death, an employer is not required to report the incident under OSHA's existing injury reporting requirements. There may also be situations where an illness, injury, or fatality is deemed to be unrelated to work, but heat exposure at work may have contributed to that incident.

Additionally, OSHA recognizes that hazardous heat can impair job tasks and reduce decision making abilities and productivity. This impairment may lead to other serious types of injuries where heat is not factored into the causal assessment. Exposure to hazardous heat can also result in the exacerbation of pre-existing medical conditions, such as diabetes or cardiovascular disease. A study of U.S. Army personnel demonstrated that those who have been hospitalized in U.S. hospitals for heat-related illness may experience organ damage that can persist for years afterward, even resulting in an increased risk of death from cardiovascular disease and ischemic heart disease compared to those previously hospitalized for other reasons. Recurrent exposure to hazardous heat, and resulting dehydration, has also been found to be associated with acute and chronic kidney disease and injury in agricultural workers and others performing manual labor in outdoor work settings, particularly in South America, Central America, and certain South Asian countries. These illnesses appear to be unrelated to traditional causes of the disease. Although much of this research has focused on international populations, there is emerging evidence of this health hazard in occupational populations within the U.S.

Q2. Why was 90 degrees Fahrenheit selected as the trigger temperature for needing a program for management of heat illness?

Multiple stakeholder concerns raised during preceding stakeholder workshops and hearings caused Nevada OSHA to re-examine the trigger temperature and mechanism to be used by this regulation. In review of stakeholder comments, the common suggestion was to evaluate 90 degrees Fahrenheit as a possible alternative to the previously selected 80 degrees Fahrenheit. In review of available data, Nevada OSHA found that 90 degrees Fahrenheit was a reasonable approximation of the Heat Stress and Strain Threshold Limit Value (TLV)[1] recommended in the original draft regulation, given Nevada's low humidity levels, typical work clothing, and moderate exertion levels.

The evaluation considered the following information:

- The average worker wears normal breathable clothing.
- Many Nevadan cities consistently have, on average, low humidity throughout the year with Las Vegas being one of the driest major metropolitan areas in the country as noted by the National Center for Environmental Information's annual average relative humidity charts.
- How the Heat Stress and Strain Threshold Limit Value TLV addresses action limits and work schedules per hour.
    - TLV action limits are prescribed thresholds for when action must be taken to protect a worker from illness to a condition such as heat exposure.
    - TLV work schedules per hour is the allocation of work in an hourly cycle of work and recovery.
    - The TLV separates the allocation of work and rest into 4 categories:
        - **75 to 100%** (25 to 0% recovery time per hour)
        - **50 to 75%** (50 to 25% recovery time per hour)
        - **25 to 50%** (75 to 50% recovery time per hour)
        - **0 to 25%** (100 to 75% recovery time per hour)
    - The TLV separates work into 4 categories based on bodily stress:
        - **Light** (Sitting with light manual work. Standing with some light arm work and occasional walking, etc.)
        - **Moderate** (Sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, light pushing and pulling. Normal walking.)
        - **Heavy** (Intense arm and trunk work, carrying, shoveling, manual sawing, pushing and pulling heavy loads, walking at a fast pace, etc.)
        - **Very Heavy** (Very intense activity at fast to maximum pace.)

To approximate the Heat Stress and Strain Threshold Limit Value, Nevada OSHA did the following:

- Calculated wet-bulb globe temperature using the average relative humidity in Nevada and conservative estimates on wind speed and cloud cover.
    - Factored in the proposed 90-degree dry-bulb temperature.
    - Assumed that in the above general conditions, workers can perform:
        - Moderate work at 75 to 100% of their work schedule (per hour).

[1] Heat Stress and Strain portion of the Threshold Limit Values and Biological Exposure Indices, 2020 edition, published by the American Conference of Governmental Industrial Hygienists.

- Heavy work at 50 to 75% of their work schedule (per hour).

With these assumptions, the TLV indicates that the action levels for these above work parameters is approximately 2 to 3 degrees Fahrenheit above the proposed 90-degree trigger allowing a small safety factor. In summary, Nevada OSHA has determined that 90 degrees as a trigger for action provides an appropriate balance of reasonableness and workplace health.

It is important to note that jobsite conditions, protective equipment demands, or prolonged intense physical activity may require additional efforts (assessments and controls) made by the employer. Examples of such conditions or demands include, but are not limited to, the following:

- Employees donning impermeable Tychem suits throughout their shift.
- Employees performing work in close proximity to heat generating equipment such as furnaces or ovens throughout their shift.
- Employees performing heavy labor throughout most of their shift such as manual trench digging.

Q3. When a person is suffering from heat illness symptoms, why is the goal to reduce body temperature to 100.4 degrees?

Nevada OSHA has adjusted the regulation based on stakeholder feedback, due to each worker having distinctly different levels of acclimatization, body types, etc. The regulation will now focus on the on the general goal of reducing body temperature and will not prescribe a specific temperature.

Q4. What will Nevada OSHA do when Federal OSHA releases a federal Heat Illness Standard?

Promulgation of new occupational safety and health standards at the federal level often take significantly longer to adopt compared to state level agencies. For example, the Federal OSHA Bloodborne Pathogen standard was published as a proposed rule on November 27, 1987 and was published as a final rule on December 6, 1991. Federal OSHA published an advanced notice of proposed rulemaking for their Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings standard on October 27, 2021. As of January 26, 2022, Federal OSHA has closed public comment. At this time, Federal OSHA has not released a timeline for this rulemaking process.

When Federal OSHA promulgates their Heat Illness Standard, Nevada OSHA will be notified and given a period of time to evaluate existing Nevada regulations and provide a response to Federal OSHA indicating that the regulation is *at least as effective* as the federal standard, or if changes will need to be made to the Nevada regulation. If changes are necessary, Nevada will initiate the rulemaking process to add any provisions that are warranted to be *at least as effective* as the federal standard.

It's important to further note, that as Federal OSHA proceeds with the promulgation of a Heat Illness Standard, they are reviewing existing and proposed regulations related to heat illness. As Nevada OSHA proceeds with the promulgation of this performance-based regulation, we have an opportunity to demonstrate the effectiveness of such a regulation, and further support Nevadan businesses by demonstrating that a performance-based regulation can effectively protect workers from heat illness.

ATTACHMENT

Nevada OSHA Draft Heat Illness Regulation, February 28, 2022

REVISED PROPOSED REGULATION OF THE

DIVISION OF INDUSTRIAL RELATIONS OF THE

DEPARTMENT OF BUSINESS AND INDUSTRY

LCB File No. R053-20

February 28, 2022

EXPLANATION – Matter in *italics* is new; matter in brackets [omitted material] is material to be omitted.

AUTHORITY: §§1-11, NRS 618.295 and 618.315.

A REGULATION relating to occupational safety and health; imposing certain duties on employers of employees who are exposed to certain high temperatures; requiring employers to ensure that employees have ready access to potable drinking water; requiring employers to provide employees with access to shade under certain circumstances; requiring an employer to provide employees with training relating to heat illness; imposing certain duties on an employer of an employee who shows signs or symptoms of heat illness; and providing other matters properly relating thereto.

Legislative Counsel's Digest:

Existing law requires certain employers to establish a written safety program. (NRS 618.383) **Section 7** of this regulation: (1) requires an employer of employees who are exposed to certain high temperatures to include a program for the management of heat illness in the written safety program; and (2) sets forth certain items which must be included in such a program for the management of heat illness.

Section 8 of this regulation requires an employer to provide certain supervisory and nonsupervisory employees with training relating to heat illness.

Section 9 of this regulation imposes certain duties on an employer of an employee who shows signs of heat illness or demonstrates symptoms of heat illness.

Section 1. Chapter 618 of NAC is hereby amended by adding thereto the provisions set forth as sections 2 to 9, inclusive, of this regulation.

Sec. 2. ***As used in sections 2 to 9, inclusive, of this regulation, unless the context otherwise requires, the words and terms defined in sections 3, 4, 5, and 6 of this regulation have the meanings ascribed to them in those sections.***

Sec. 3. *"Acclimatization" means the temporary adaptation of a person's body to work in the heat that occurs gradually when the person is exposed to the heat.*

Sec. 4. *"Heat illness" means a medical condition resulting from the body's inability to cope with a particular heat load and includes, without limitation, heat cramps, heat rash, heat exhaustion, fainting and heat stroke.*

Sec. 5. *"Personal risk factors for heat illness" means factors that affect the retention of water by the body and other physiological responses to heat, including, without limitation, a person's:*

1. Age;

2. Degree of acclimatization;

3. Health;

4. Consumption of water;

5. Consumption of alcohol;

6. Consumption of caffeine; and

7. Use of prescription medications.

Sec. 6. *"Shade" means a blockage of direct sunlight.*

Sec. 7. *1. An employer of employees who are exposed to temperatures at or above a dry-bulb temperature of 90 degrees Fahrenheit shall include a program for the management of heat illness in the written safety program required by NRS 618.383.*

2. A program for the management of heat illness required pursuant subsection 1 must include:

(a) Provision for potable water, including how water will be provided where water is not plumbed or otherwise continuously provided;

(b) Provision for rest breaks where employees are exhibiting signs of heat illness;

(c) Provision for shade or other means for cooling at least as effective as shade during daylight hours;

(d) Monitoring of employees for heat illness;

(e) Monitoring of acclimatization of employees for at least the first 14 days of their employment;

(f) Identification of work processes that may generate additional heat or humidity and procedures to mitigate the hazards;

(g) Training of employees and management;

(h) Procedures for responding to an emergency; and

(i) Where an employer is required to establish a safety committee pursuant to subsection 2 of NRS 618.383, provide employees with an opportunity to provide comment on the program for management of heat illness.

Sec. 8. *1. An employer who is required to include a program for the management of heat illness in the written safety program required by NRS 618.383 pursuant to Section 7 of this regulation shall provide training on the following topics to all supervisory and nonsupervisory employees who may be affected by issues relating to heat illness:*

(a) Working conditions that create the possibility that heat illness could occur, including:

(1) Air temperature;

(2) Relative humidity;

(3) Radiant heat from the sun and other sources;

(4) Conductive heat from the ground and other sources;

(5) The movement of air;

(6) The severity and duration of workloads; and

(7) Protective clothing and personal protective equipment worn by an employee.

(b) The personal risk factors for heat illness.

(c) The importance of frequent consumption of small quantities of water or electrolyte replacement liquids, when the work environment is hot and an employee is likely to be sweating more than usual in the performance of his or her duties.

(d) The importance of acclimatization.

(e) The different types of heat illness and the common signs and symptoms of heat illness.

(f) The importance to an employee of immediately reporting to the employer, directly or through a supervisor for the employer, signs or symptoms of heal illness in the employee or in a coworker.

(g) The employer's procedures for:

(1) Responding to symptoms of possible heat illness, including how medical services will be provided should they become necessary;

(2) Compliance with subsections (a) and (b) of 29 CFR 1910.151, including contacting emergency medical services and, if necessary, transporting an employee to a location where the employee can be reached by a provider of emergency medical services; and

(3) Ensuring that, in the event of an emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders.

2. Before assigning a supervisor to supervise employees working in the heat, an employer shall provide the supervisor with training on the following topics:

(a) The information which is required to be provided to the supervisor pursuant to subsection 1.

(b) The procedures which the supervisor is to follow:

(1) To implement the applicable provisions of subsection 1; and

(2) When an employee exhibits symptoms consistent with possible heat illness, including procedures for responding to an emergency.

Sec. 9. *If an employee shows signs of heat illness or demonstrates symptoms of heat illness, his or her employer must:*

1. Relieve the employee from duty;

2. Provide the employee with means to reduce his or her body temperature; and

3. Monitor the employee to determine whether medical attention is necessary.