

PRESENTATION

HEAT STRESS READINESS

Risk Management in the Shadow of OSHA's HIIP Rule

Presented by

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— for HSE / QRC Professionals

OBJECTIVES

50YRS IN 45MIN

History to Now (C - Compliance)

Measurement (H - Industrial Hygiene)

Risk Assessments / Reduction (R - Risk Management)

Internal Buy In (Strategy - Executive Support / Advisory)

Project Management Considerations:

- **Heat Injury & Illness Prevention Plan** (Q - Quality Documents)
- **Vendors & Contractors** (S - Safety Purchasing; Project Procurement)
- **Leadership Upskilling** (HR - Coaching / Development)
- **Emergency Plan Updates** (HR - Business Continuity; S - Post-Incident Response)
- **Cirriculum Development** (HR - Training; S - Safety Training)
- **Special Consideration *Acclimation** (HR - Onboarding / Orientation)

RJ'S RECOMMENDATIONS

If you get stuck in the woods, follow the Raven



ENTRY LEVEL PROFESSIONAL FOCUS

OSHA COMPLIANCE

Understand the **HIIP Proposed Rule** and key compliance triggers (80°F & 90°F via Heat Index or WBGT).

Begin **heat-hazard risk assessments**, especially for heat-generating equipment.



MID LEVEL PROFESSIONAL FOCUS

EMPLOYEE ENGAGEMENT

Integrate HIIP elements into your **customized curriculum** & the **Heat Illness Prevention Plan** (HIIPP).

Collaborate and **partner with departments** to update matrices, policies, procedures, protocols and programs.



SENIOR LEVEL PROFESSIONAL FOCUS

ELT / EXECUTIVE SUPPORT & ADVISORY

Manage HIIPP Initiating, Planning, Executing, Monitoring and Controlling, and Closing phases of **Project Management** across departments.

Preemptively drive **Executive Advisory** and **Leadership Upskilling** for strategic compliance.

T I M E L I N E



1955

Belding-Hatch Heat Stress Index was an early model of heat exchange; person vs. environment

1963

Lind's criterion for setting thermal environmental limits for everyday work (WBGT)

1971

OSHA is founded on the General Duty of Employers

1971

CDC: NIOSH first published their Criteria for a Recommended Standard; Relied on Lind's work for Heat

1986

OSHA published "Working in Hot Environments"

1990

OSHA issued first heat stress guidelines "Heat Stress Technical Manual"; 1996 & 99 & 2017

2011

OSHA-NIOSH INFOSHEET: Protecting Workers from Heat Illness

2011

OSHA initially launched its "Heat Illness Prevention" campaign & adds resources periodically

2011

OSHA was petitioned by Public Citizen for a heat stress standard; Again in 2018 & 19

2016

NIOSH published Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments

2016

OSHA released its first Regional Emphasis Programs on heat-related hazards

2017

NIOSH published "Work Schedules Fact Sheet" & "Acclimation Fact Sheet"

2017

NIOSH-OSHA Released "Heat Safety Tool App" for Heat Index monitoring

2019

The Senate urged OSHA to initiate rulemaking to address heat stress.

2021

OSHA issued a Request for Information (RFI), seeking input on the need for a formal heat stress standard

2021

OSHA gave Advanced Notice & Notice of Proposed Rulemaking; Resulting Request for Comments

2022

OSHA implemented a National Emphasis Program on heat-related hazards

2023

OSHA established a HIIP Work Group to provide recommendations on Standard

2023

OSHA convened a Small Business Advocacy Review (SBAR) Panel

2024

NIOSH compiled their Heat Resources by topic on their website

2024

OSHA presented framework for HIIP rule to the Advisory Committee on Construction Safety and Health

2024

OSHA held a listening session with tribal representatives

2024

OSHA publishes Proposed Rule in the Federal Register & opens it to public comments; Proposed Rule Factsheet

Heat Rulemaking Stages

Stage 1

Conducting Preliminary Rulemaking Activities

Stage 2

Developing the Proposed Rule

Stage 3

Publishing the Proposed Rule

Stage 4

Developing and Analyzing the Rulemaking Record

Stage 5

Developing the Final Rule

Stage 6

Publishing the Final Rule

Stage 7

Post-Promulgation Activities

Public Hearing Information:

An informal public hearing on OSHA's *Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings* proposed rule is scheduled to be held virtually beginning on June 16, 2025, and continuing through July 2, 2025. The period to submit a Notice of Intention to Appear (NOITA) closed on May 2, 2025. The hearing schedule and procedures, as well as public livestream links to view the hearing, are available below.

- [Hearing Schedule](#) **UPDATED**
- [Hearing and Post-Hearing Procedures](#)
- **Public Livestream Links**
 - [Monday, June 16, 2025](#)
 - [Tuesday, June 17, 2025](#)
 - [Wednesday, June 18, 2025](#)
 - [Friday, June 20, 2025](#)

- [Monday, June 23, 2025](#)
- [Tuesday, June 24, 2025](#)
- [Wednesday, June 25, 2025](#)
- [Thursday, June 26, 2025](#)
- [Friday, June 27, 2025](#)

- [Monday, June 30, 2025](#)
- [Tuesday, July 1, 2025](#)
- [Wednesday, July 2, 2025](#)

The public comment period closed on January 14, 2025. Public comments are available for viewing in the Heat Injury and Illness Prevention rulemaking docket at <https://www.regulations.gov/docket/OSHA-2021-0009/comments>.

OSHA's *Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings* proposed rule was published in the Federal Register on August 30, 2024, and is available for viewing at <https://federalregister.gov/d/2024-14824>.

Additional information on OSHA's rulemaking process and how stakeholders can participate is available at <https://www.osha.gov/laws-regs/rulemakingprocess>.

Obstacles **Historical injury/illness data; consider if there is underreporting of heat-related illnesses when assessing risk.**

— Risk Reduction vs. Tolerance

RISK ASSESSMENT

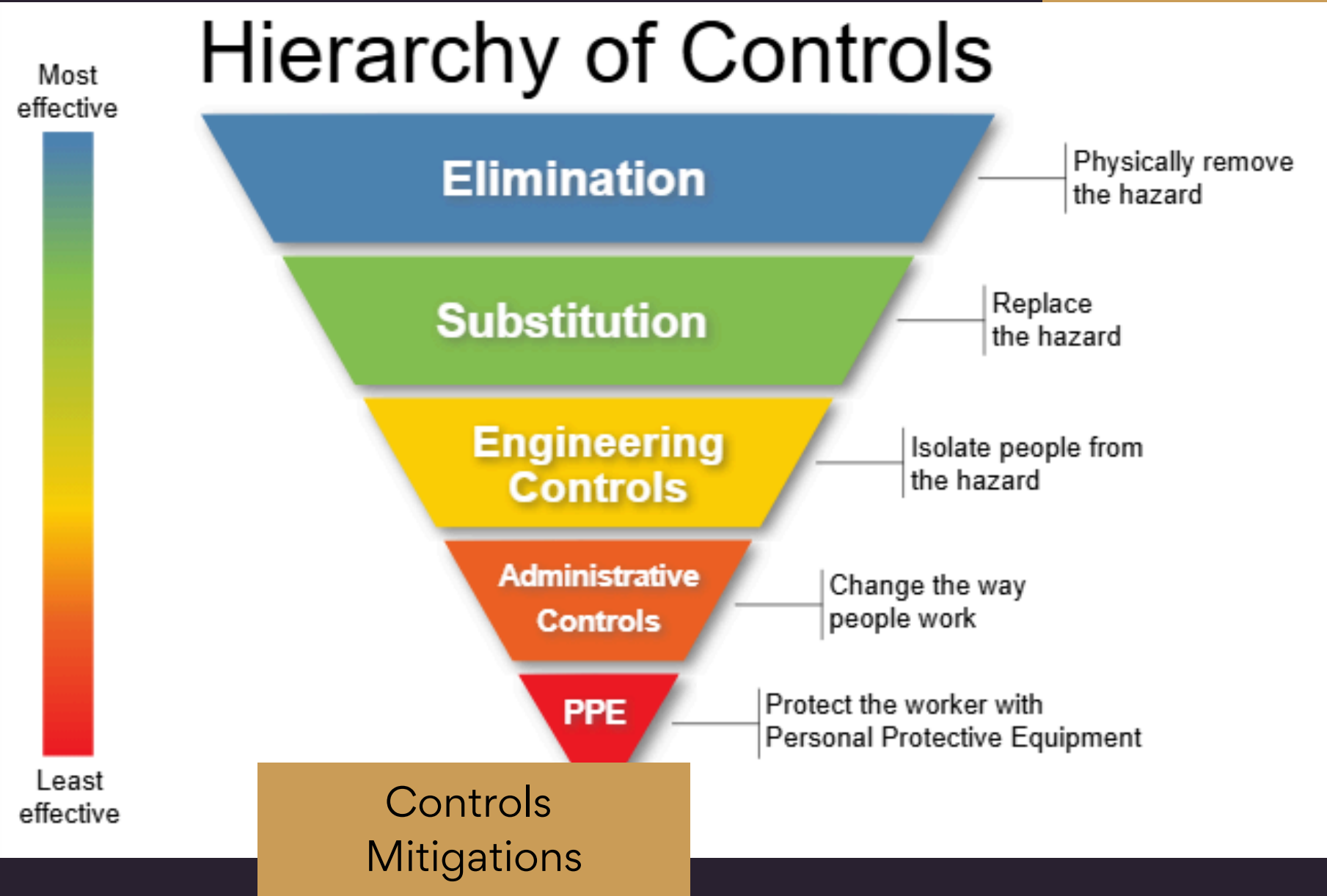


Hazard Identification
Measurements

Evaluate risk factors such as direct sunlight exposure, heat-producing equipment, workload intensity, and PPE usage

Continuous Evaluation

Use direct observation, buddy systems, and physiological monitoring to detect early signs of heat illness. Regularly review effectiveness after incidents and update plans accordingly.



Prioritize engineering controls (shade, ventilation, mechanical cooling).

Implement administrative controls (staggered shifts, enforced rest and hydration breaks, acclimatization plans for new or returning workers)

Incorporate PPE considerations, including its effect on heat load and potential use of cooling garments

Record Keeping

- Maintain HIIP Documentation:
- Monitoring Logs (min. 6mo.)
 - Risk Assessment Reports
 - Acclimatization Records
 - Incident Reports

Parameter	WBGT	Heat Index
Measured in the sun	●	
Measured in the shade		●
Includes temperature	●	●
Includes relative humidity	●	●
Includes wind	●	
Includes cloud cover	●	
Includes sun angle	●	

Examples						
Temp F	Dew Point F	RH %	Sky %	Wind mph	Heat Index F	WBGT F
90	65	42	05	03	92	89
90	65	42	05	13	92	83
90	65	42	65	13	92	81
90	70	52	10	06	96	88
90	70	52	60	06	96	86
90	70	52	60	13	96	85
100	70	39	10	13	108	90
100	70	39	10	5	108	94
100	70	39	65	05	108	91

Proposed exclusions for: Work activities with no expectation of exposure at or above heat index of 80°F. Short duration/Incidental exposures. Emergency Response. Indoor sites kept below 80°F. Telework. Indoor sedentary activities

****Exposure to full sunshine can increase heat index values by up to 15°F**
****PPE / Respirator Considerations (-Heat Dissipation, +Airway Temp.) FF(150°F)**

— Specifically the National Weather Service Heat Index to determine when heat triggers are met.

HEAT INDEX

Initial Heat Trigger Threshold: ≥ 80°F NWS Heat Index

→ Control Measures: Requires basic protections, such as water (at least 1 quart per employee per hour), paid rest breaks in break areas with cooling measures, acclimation protocols, regular 2-way communication and training.

High Heat Trigger Threshold: ≥ 90°F NWS Heat Index

→ Control Measures: Requires enhanced controls, including observation, mandatory paid breaks (25m/2hr), hazard alert, indoor signage, and emergency response (per emergency response plan).

Alternative Methods (optional)

Employers may choose to use Wet Bulb Globe Temperature (WBGT) or other indices in addition to the NWS Heat Index—but only if they are as protective or more so. OSHA still expects clear justification and documentation for any alternative used.

****Applies to all employers conducting outdoor and indoor work in all general industry, construction, maritime, and agriculture sectors where OSHA has jurisdiction.**

Indoor work sites: Required to identify work areas with the potential for hazardous heat exposure, develop and implement a monitoring plan, and seek employee input.

— Wet Bulb Globe Temperature vs Heat Index

MONITORING & MEASUREMENT

Premium (WBGT): TSI Incorporated - Trusted by many Industrial Hygienists

- QUESTemp® 32-34-36 Area Heat Stress Monitors



Good (WBGT): Many Vendors - Often running \$500+

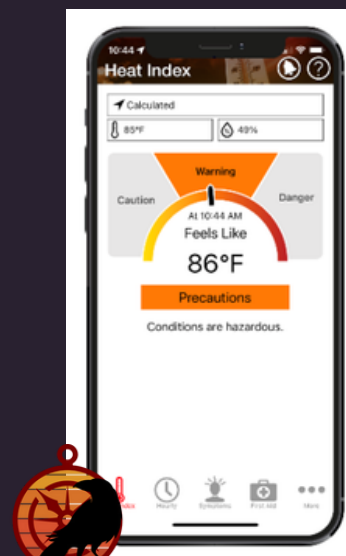
Average (WBGT): Many vendors - Often running from \$35-\$250

- AZ87786 Handheld WBGT Data Logger Wet Bulb Globe Temperature Meter



Convenient (Both): Phone / Website Apps - Free to Frugal

- OSHA/NIOSH Heat Safety Tool App
- Zelus WBGT App (WBGT from meteorological data)
- [OSHA Outdoor WBGT Calculator](#)



NWS Heat Index		Temperature (°F)															
Relative Humidity (%)		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										



Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution
Extreme Caution
Danger
Extreme Danger

WHY is it CALLED

WET BULB GLOBE TEMPERATURE

The Wet Bulb Globe Temperature (WBGT) is derived from a combination of temperatures from three thermometers.

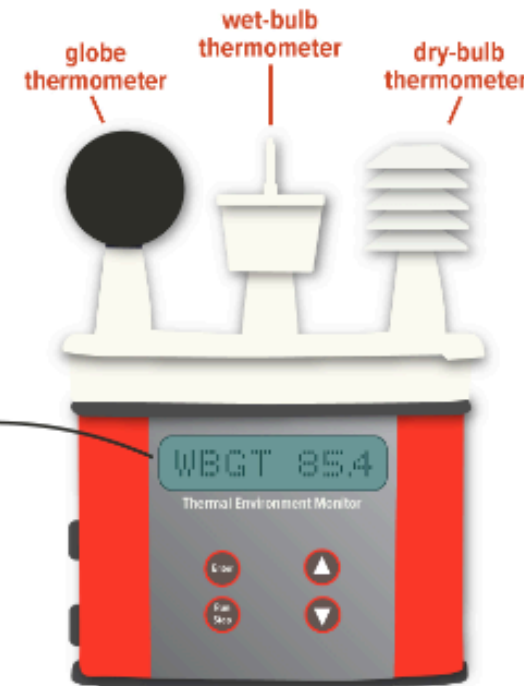
Black globe - for solar factor (sun angle and cloud cover)

Wet bulb - for humidity

Dry bulb - for the ambient temperature

NOTE: WBGT observations and forecasts are not directly comparable to temperature or heat index scales.

For example: WBGT values of 90 or greater are dangerous for strenuous outdoor activities.



Example of WBGT Equipment

Resistance to Change; Perceived Value (ROI), Conflict Management, Current Strategic Initiatives, Context Matters

— Internal Buy In: Safety is Sales Through ‘Best Interest’

STAKEHOLDERS

HR+ OPS HOP Framework: (Systems Approach) philosophy for managing **human and organizational performance** that emphasizes learning, understanding the context of work, and creating systems that are resilient to errors. HOP requires leadership to actively support a culture of learning, transparency, and continuous improvement, rather than a culture of fear and blame. It's a shift from traditional safety management approaches that often target individual errors.



EXECUTIVE LEADERSHIP TEAMS / EXECUTIVES

- +Priority Strategy Initiatives
- +Resources / Leverage
- +Authority & Agility
- +Fast Track
- **Business Planning



DEPT. PARTNERING / XFUNCTION TEAMS

- +ELT Communication
- +OPS Support
- +Shared Admin. Workload
- +Company Alignment
- **Industry Specific



OPS MANAGERS FRONTLINE SUPERVISORS

- +Field Insights
- +Project Mgmt Efficiency
- +Success Implement Phase
- +Field Productivity
- **Liability / Budget



FIELD / FRONTLINE ENGAGEMENT

- +Culture Impact
- +Retention / Training
- +Succession / Upskilling
- +OPS Feedback
- **Change Mgmt / Expertise

Obstacles Ensuring that all requirements are at no cost to employees (mandatory) can result in a needed significant Safety Budget increase

Heat Injury & Illness Prevention Plan

HIIP(P).

HEAT ILLNESS PREVENTION

- Protecting New Workers
- Training
- Heat Hazard Recognition
- [Heat Stress Calculator](#)
- Personal Risk Factors
- Controls & Mitigations

DAY-TO-DAY SUPERVISION

- Outdoor Work
- Work / Rest Schedule
- Heat Sources
- Strenuous Physical Activity
- PPE Compliance
- Safety Based Culture
- Observations Signs / Symptoms

HEAT EMERGENCY RESPONSE

- Heat-Related Illnesses
- First Aid
- Medical Services

**Emergency Plan Updates

HEAT SAFETY COORDINATORS

- Heat-Related Safety Protocols
- Evaluate Worksite Conditions Daily
- Ongoing Monitoring
- Maintain Documentation

Anyone that meets requirements:

**Knowledge: Heat Stress Hazards

**Trained in the HIIPP Requirements

**Authorized by the Employer

These requirements of the proposed standard are summarized in the table below:

Provision	All Covered Employers (See Scope)	At or Above Initial Heat Trigger	At or Above High Heat Trigger
Identifying heat hazards	●	●	●
Heat illness and emergency response procedures	●	●	●
Training for employees and supervisors	●	●	●
Heat injury and illness prevention plan (HIIPP)	●	●	●
Recordkeeping	●	●	●
Drinking water		■	■
Break area		■	■
Indoor work area controls		■	■
Acclimatization plan for new or returning workers		■	■
Rest breaks (if needed)		■	■
Effective communication means with employees		■	■
Rest breaks (minimum 15 minutes every 2 hours)			▲
Supervisor or buddy system to observe for signs and symptoms			▲
Hazard alert			▲



If you are struggling with workload, understaffed, have budget woes or are in a time crunch during Project Management, there are compliance and safety vendors out there that can help you. **Such as [Safety Procedure Systems \(SPS\)](#) – there is no shame in getting help for at least a starting point.

HIIP(P) SCHEDULE

Temperature (°F)	Light Work Minutes Work/Rest	Moderate Work Minutes Work/Rest	Heavy Work Minutes Work/Rest
90	Normal	Normal	Normal
91	Normal	Normal	Normal
92	Normal	Normal	Normal
93	Normal	Normal	Normal
94	Normal	Normal	Normal
95	Normal	Normal	45/15
96	Normal	Normal	45/15
97	Normal	Normal	40/20
98	Normal	Normal	35/25
99	Normal	Normal	35/25
100	Normal	45/15	30/30
101	Normal	40/20	30/30
102	Normal	35/25	25/35
103	Normal	30/30	20/40
104	Normal	30/30	20/40
105	Normal	25/35	15/45
106	45/15	20/40	Caution
107	40/20	15/45	Caution
108	35/25	Caution	Caution
109	30/30	Caution	Caution
110	15/45	Caution	Caution
111	Caution	Caution	Caution
112	Caution	Caution	Caution

Temperature Adjustments for this Work/Rest Schedule

Adjust the temperature in the table based on:

Environmental conditions

- Full sun (no clouds): Add 13 °F
- Partly cloudy/overcast: Add 7 °F
- No shadows visible, in the shade, or at night: No adjustment

AND

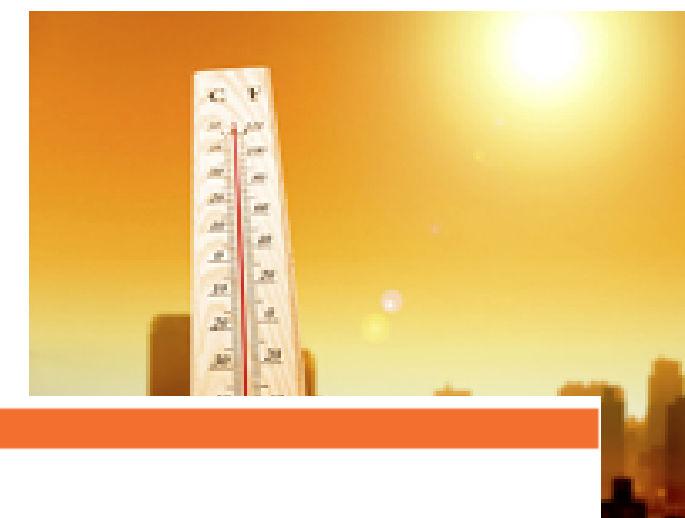
Humidity

- 40% humidity: Add 3 °F
- 50% humidity: Add 6 °F
- 60% humidity or more: Add 9 °F

Example Adjustment

Conditions at a mine are 90 °F, with partly cloudy skies and 50% humidity. Adjust the table as follows:

Add 7 °F for partly cloudy skies and 6 °F for 50% humidity, to arrive at 103 °F.



Examples of Work at Different Intensity Levels

Light work

- Operating equipment
- Inspection work
- Walking on flat, level ground
- Using light hand tools (wrench, pliers, etc.). However, this may be moderate work depending on the task
- Travel by conveyance

Moderate work

- Jack-leg drilling
- Installing ground support
- Loading explosives
- Carrying equipment/supplies weighing 20–40 pounds
- Using hand tools (shovel, fin-hoe, scaling bar) for short periods

Heavy work

- Climbing
- Carrying equipment/supplies weighing 40 pounds or more
- Installing utilities
- Using hand tools (shovel, fin-hoe, scaling bar) for extended periods

Case Study: Use of Work/Rest Schedule

A crew was shoveling ore out from under the primary conveyor at a surface mine in Arizona in August. The high temperature that day was 113 °F. The crew was rotating in 10-minute shifts and hydrating between shifts. Coworkers noticed signs of heat illness in two employees, and they were transferred to the medical station for evaluation. From there they were sent to the hospital, where they were given IV saline and released home. Both employees recovered after rehydration at the hospital.

Lessons Learned

In extreme heat, even a work/rest schedule may not eliminate the risk of heat illness. In this case, use of work/rest schedules, frequent hydration, and team monitoring helped keep this situation from becoming even more serious. Without those safety precautions the workers could have potentially suffered more severe heat illness, possibly including heat stroke, which is life threatening.

— NIOSH Acclimation Factsheet

ACCLIMATION

Sample Acclimatization Schedule

NIOSH Acclimatization Recommendations for New Workers

1st day	20% usual work duration
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2nd day	40% usual work duration
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3rd day	60% usual work duration
---------	-------------------------

4th day	80% usual work duration
---------	-------------------------

5th day	100% usual work duration
---------	--------------------------

NIOSH Acclimatization Recommendations for Workers with Previous Experience* with the Same Job

1st day	50% usual work duration
---------	-------------------------

2nd day	60% usual work duration
---------	-------------------------

3rd day	80% usual work duration
---------	-------------------------

4th day	100% usual work duration
---------	--------------------------

*Workers returning from an absence

How quickly does the body LOSE heat tolerance after acclimatization?

- Acclimatization will be maintained for a few days after heat exposure stops, but will begin to be lost after about 1 week away from working in the heat.
- After 1 month away from work in the heat, most people’s heat tolerance will have returned to baseline.
- Working for 1–2 days in cooler conditions or taking breaks in air conditioning will not hurt acclimatization.

Case Study: Hazards of Not Acclimatizing Workers

A 41-year-old construction worker was sawing boards in 93 °F heat. At 5 p.m., the worker collapsed in the parking lot. He was found by another employee. His body temperature was recorded at 108 °F when he was admitted to the hospital. He died the next day. At the time of the incident, the employee had been working for the company for one day. The company had no formal heat stress policy or acclimatization plan.

Lessons Learned

- Heat casualties often occur with new or less experienced employees.
- Deaths from heat stress often occur during the first few days on the job.
- Employers should have heat stress policies, and should implement acclimatization plans.



CIRRICULUM DEVELOPED

Provide initial and annual refresher training for supervisors, heat safety coordinators, and employees, as well as supplemental training after changes in exposure to heat hazards, policies and procedures, or the occurrence of a heat injury or illness.

****Payroll is 15-50% of Liabilities on average depending on industry.**

FIRST AID, CPR, AED CERTIFICATIONS

Red Cross, National Safety Council and HSI have 2yr First Aid / CPR / AED certification programs that satisfies the Heat Related Illnesses required by the HIIP Rule taught by authorized and credentialed instructors.

****You can certify under any of those three organizations as an in house Instructor for your company which would serve as the facility center. The organizations offer discounted / free bridge programs between them because they are partnered so if you chose, you could gain access to each organization's curriculum for self development as an instructor. After completing Instructor qualifications and requirements, you just pay a small annual instructor upkeep rather than taking the Train the Trainer class again.**

UPSKILLING COACHING (CUSTOM EXAMPLES)



Heat Risk Recognition for Supervisors

Spot environmental and behavioral indicators of heat risk and respond appropriately.

Decision-Making Under Heat Stress

When to pause work, escalate concerns, adjust schedules, or activate emergency protocols.

Leading Acclimatization Protocols

Oversee gradual exposure / monitor new or returning workers.

Communication & Worker Observation

Conduct active monitoring, buddy systems, and routine check-ins in high-heat environments.

HIIPP Implementation

Guidance on applying field procedures, documenting compliance, and enforcing protective actions.

Team Safety Culture Leadership

Reinforce hydration breaks, PPE adjustments, and worker self-reporting in a no-blame culture.

Post-Incident Coaching & Reflection

Debrief tools to coach teams after near misses or incidents involving heat-related illness.



MENTORING TRAINING



HIIP Plan - Field Procedures HIIP HSE Program / Policies Heat Related Illnesses

- Heat Stroke
- Heat Exhaustion
- Heat Cramps
- Heat Syncope
- Heat Rash
- Rhabdomyolysis (muscle breakdown)

Signs & Symptoms

First Aid

Emergency Action Plans

Why It Matters

RECORD KEEPING

Ensures audit readiness during OSHA inspections or post-incident investigations.

Supports incident root cause analysis and post-event coaching.

Tracks training effectiveness and gaps across departments.

Enables trend analysis to improve prevention strategies and resource allocation.

—— HIIP Proposed Rule

REQUIRED DOCUMENTATION

- Heat Hazard Risk Assessments
- Monitoring Data (NWS Heat Index or WBGT readings, environmental conditions)
- Training Records (curriculum used, who was trained, when)
- Acclimatization Logs (especially for new or returning workers)
- HIIP(P), Policies & Field Procedures
- Corrective Actions & Control Implementation
- Emergency Response Plans / Reports / Procedures & Incident Logs
- Contractor and Subcontractor Acknowledgments
- Leadership Coaching & Safety Committee Notes (optional)



—— Get Away From Paper

CORFIX & SITEDOCS

Go Digital, Stay Compliant

- The HIIP Proposed Rule requires detailed, site-specific documentation: risk assessments, monitoring logs, training records, acclimatization tracking, and post-incident reporting.
- Paper-based systems are inefficient, prone to loss, and limit real-time oversight—especially across multiple crews or sites.

