POWER GENERATION VPP WORK GROUP

Q2 2025

May 15, 2025

Please check in on the chat function with your name, title and company. Feel free to add email

Safety Moment

Presented By:

Marc Sullivan

EHS Manager

Vistra Corp.

BEST DEFENSE

Everyone wins. No one gets hurt.

Follow Up is Essential

- **Examples of Audits**
  - –LOTO
  - –Housekeeping
  - –Confined Space
  - –Hot Work
  - –Hazard hunts
  - –Pro-Active Safety Engagements
    - Line Walks

What's the importance of taking corrective action?

- Enhances workplace safety.
- Fosters a culture of continuous improvement.
- Demonstrates an organization's commitment to creating a safe and health-conscious work environment.
- Amplifies the message that safety is a priority.

What happens if inaction occurs?

- Repeated incidents.
- Increases the risk of injuries.

- **What are some tools that facilities use to track completion?**
- **What are some challenges that occur?**

VPP Updates

Since last meeting:

- New VPP Applications Submitted or Accepted
- Initial VPP Approvals
- VPP Reapprovals

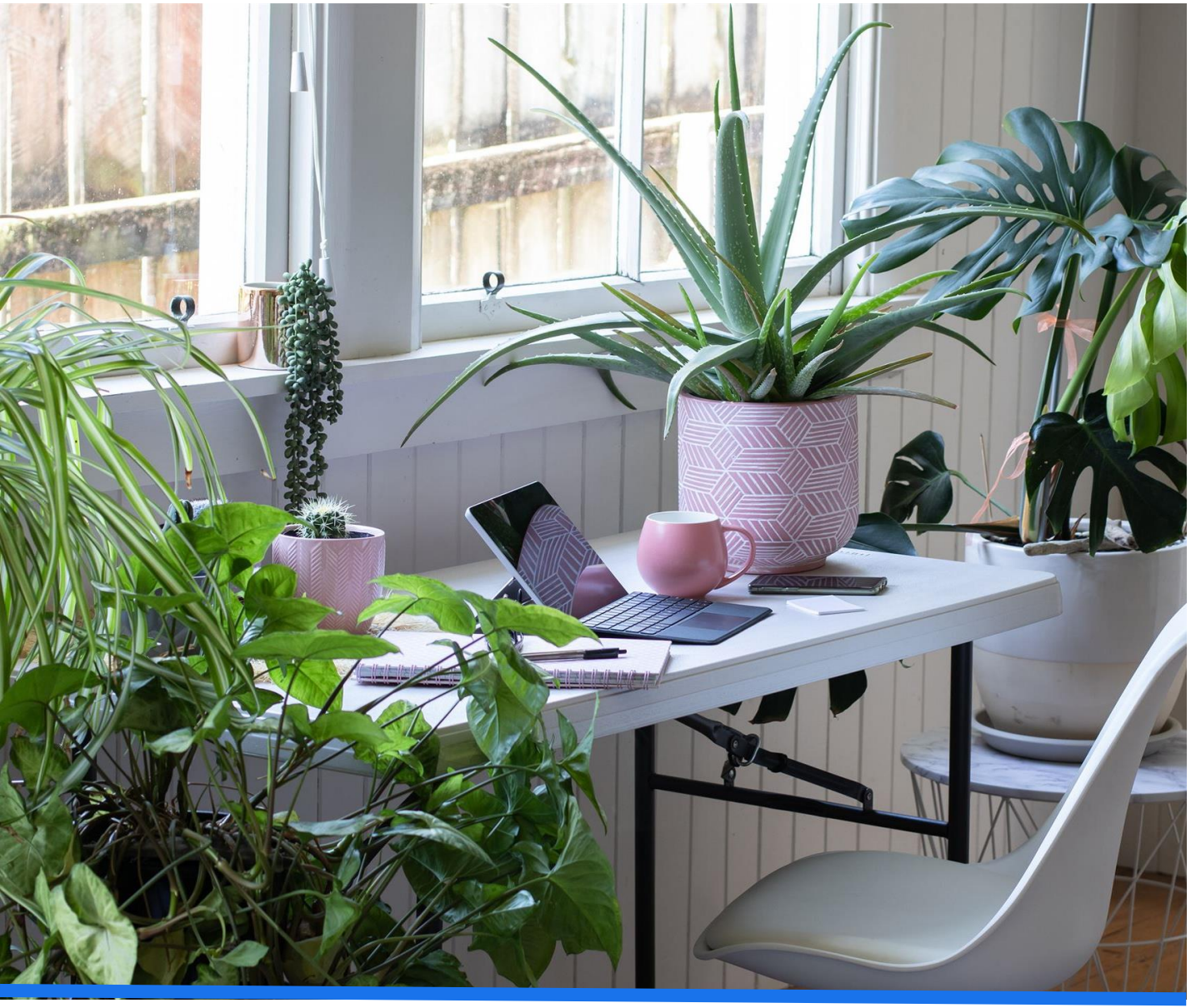
Special Government Employees (SGE)

Notes and Opportunities

- 6 SGE Training classes are scheduled through July of 2025. https://www.osha.gov/sge/sge-training
- SGE Opportunities – https://www.osha.gov/sge/onsite
- For more SGE Program Information - https://www.osha.gov/sge

VPP Element
Psychological Health and Safety: Promoting Well-Being in the Workplace

Presented By: Kelli Heflin SMS, MEPM, CSD, PHSM



Psychological Health and Safety: Promoting Well-Being in the Workplace

FOSTERING MENTAL WELL-BEING FOR A BETTER WORKPLACE

Why is this an important topic?

- Safety goes beyond OSHA compliance
- Per NASP, 20% of all accidents are caused by unsafe conditions
- 80% are caused by employee unsafe acts. If you focus on compliance, you are restricting your vision.

Safety 1.0 to Safety 2.0

- Safety 1.0 is a traditional approach.
  - Reactive
  - Preventing failure
  - Minimizing errors
  - Relies heavily on procedures, rules, and a hierarchical structure to maintain a safe work environment.
  - Centered around belief that accidents and incidents can be entirely eliminated by identifying and controlling risk.

Safety 2.0

- More modern and proactive approach, actively learning from successes and failures
- Incidents are problems to be solved
- Recognizing that unexpected events will happen and the necessity of understanding how the system adapts, copes and recovers from those events
- Promotes a culture where organizations analyze events to understand why things went well, how to handle the system's capacity to handle unexpected situations and recognizing people are different and react in a variety of ways.

So why is this in the VPP element discussion?

- Psychological Health and Safety is part of ISO 45001. The standard is 45003.
- Although OSHA has not formally adopted any element of the ISO 45003 standard, VPP companies go above and beyond what is required and this standard seems like the next logical step for continuous improvement.
- This standard involves both Management Leadership and Employee Involvement.
  - Communication and Collaboration
    - Express Concerns
    - Share Feedback
    - Actively participate

Understanding Psychological Health and Safety

Definition and Importance

Understanding Psychological Health

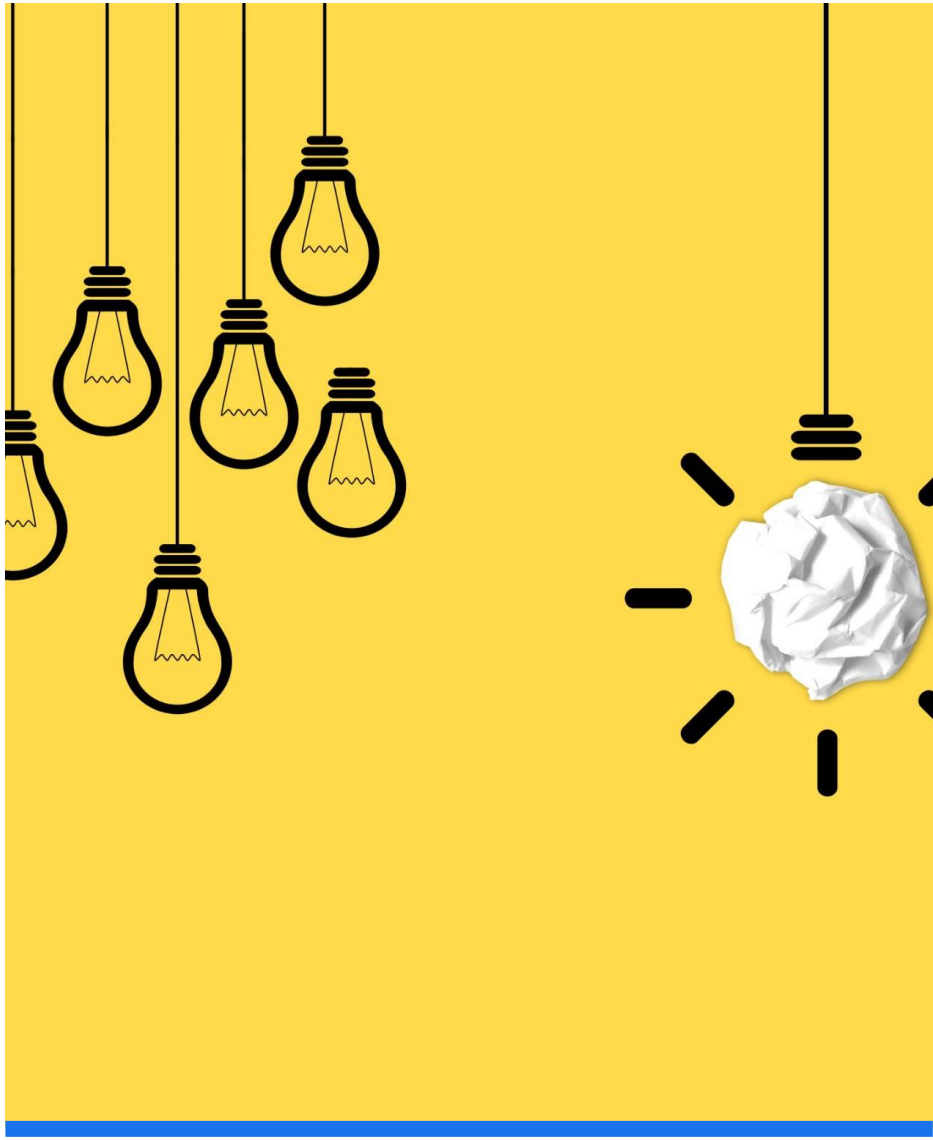
Psychological health encompasses mental and emotional well-being, which helps individuals navigate life's challenges effectively.

Creating Safe Environments

Safety involves establishing an environment that actively prevents psychological harm and supports mental health.

Importance in Workplaces

Recognizing the importance of psychological health can contribute to healthier, more productive workplaces.



Key Principles and Concepts

Understanding Workplace Stressors

Identifying and understanding workplace stressors is crucial for promoting psychological health and mitigating mental health risks.

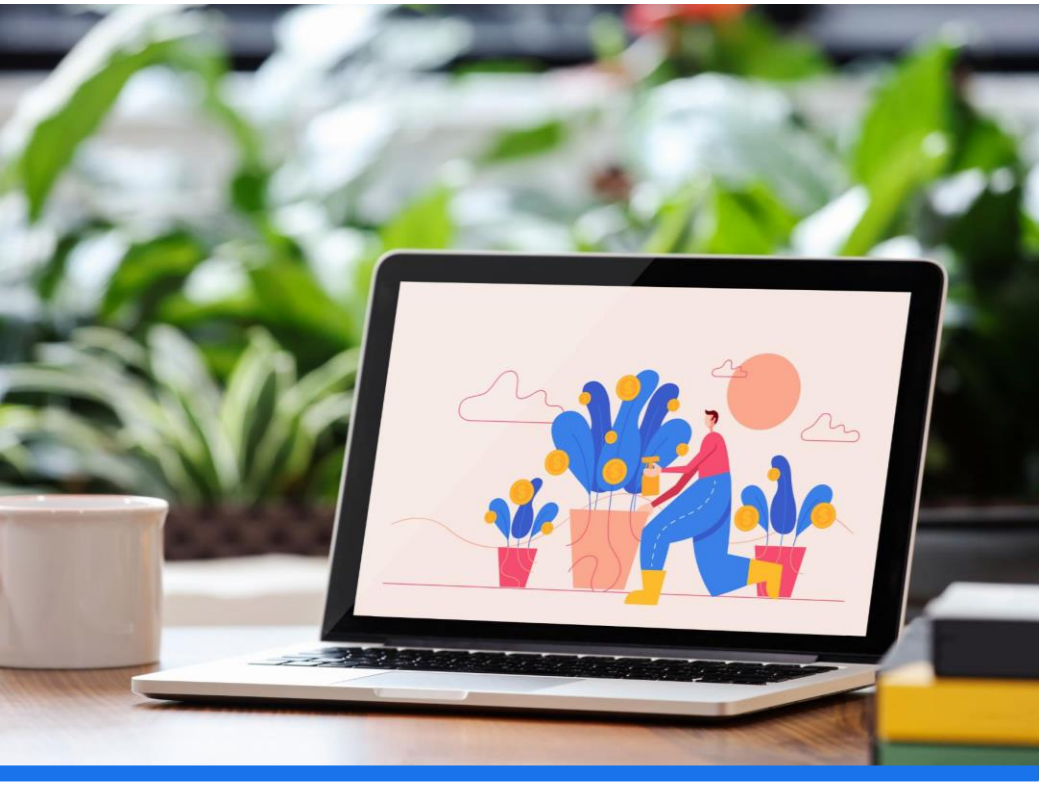
Promoting Employee Engagement

Engaging employees through supportive practices enhances job satisfaction and overall mental wellness in the workplace.

Importance of Work Culture

A positive work culture fosters psychological safety and encourages open communication among employees, enhancing mental health.

The Impact on Overall Health



Psychological Health Importance

Psychological health plays a crucial role in determining overall health and well-being, affecting various aspects of life.

Influence on Physical Well-Being

Psychological health directly influences physical health, contributing to better immune function and vitality.

Workplace Productivity

Mental well-being is linked to higher productivity levels and improved workplace relationships among employees.

Resilience in Workforce

Promoting mental well-being leads to a more engaged and resilient workforce, enhancing overall organizational performance.

Factors Affecting Psychological Health and Safety

Workplace Stressors and Their Impact

High Workloads

High workloads can overwhelm employees, leading to increased stress and reduced productivity. It's crucial to manage tasks effectively.

Tight Deadlines

Tight deadlines create pressure, often resulting in anxiety and lowered job satisfaction, affecting overall performance.

Lack of Support

A lack of support from management or coworkers can exacerbate stress, leading to feelings of isolation and burnout.

Work-Life Balance and Employee Well-Being

Importance of Work-Life Balance

A healthy work-life balance is essential for employee well-being and overall job satisfaction.

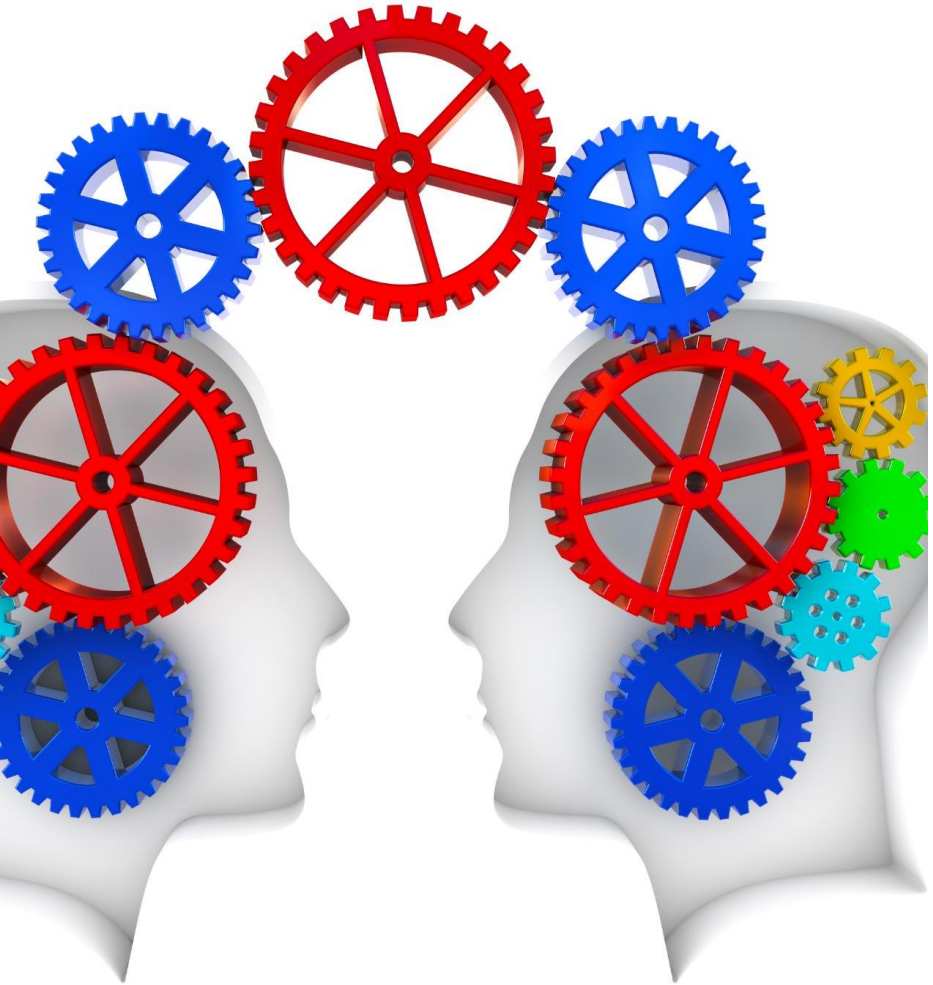
Flexible Work Arrangements—if possible

Organizations should provide flexible work options to accommodate employees' personal and professional needs.

Setting Boundaries

Promoting clear boundaries between work and personal life helps improve employee mental health and productivity.

Identifying and Addressing Psychological Risks



Recognizing Signs of Psychological Distress

Behavioral Changes

Individuals may exhibit noticeable changes in behavior, such as withdrawal or irritability, indicating psychological distress.

Absenteeism and Productivity

Increased absenteeism and decreased productivity can signal underlying psychological issues that need to be addressed.

Importance of Early Recognition

Recognizing signs of distress early can facilitate timely intervention and support for affected individuals.

NOTE: This standard is not asking manager or employees to act as trained therapists. It does set the example of recognizing that there may be an issue and both employees and management should feel comfortable either seeking support or following up and determining that there may be psychological distress.

Risk Assessment Techniques

Evaluating Work Environments

Assessing work environments helps identify potential psychological hazards that may affect employee well-being.

Psychological Hazards Identification

Identifying psychological hazards is crucial for creating safer workplace practices and improving mental health.

Data Collection Methods

Using surveys, interviews, and focus groups can provide valuable insights into workplace risks and concerns.

Developing and Implementing Intervention Strategies

Support Resources

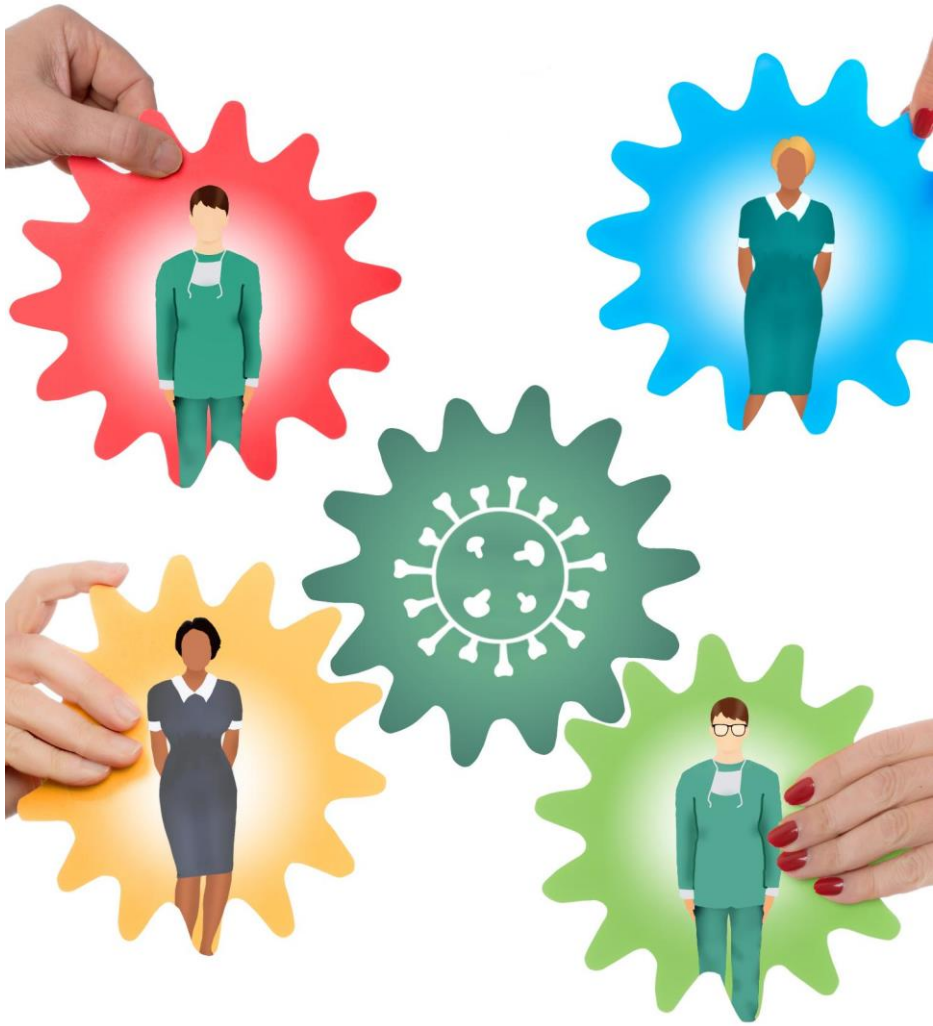
Providing support resources is crucial for employees facing challenges, promoting their overall well-being and productivity.

Enhancing Workplace Culture

A positive workplace culture encourages collaboration and communication, leading to increased employee engagement and satisfaction.

Mental Health Programs

Developing mental health programs tailored to employee needs can effectively address stress and promote mental well-being in the workplace. Most companies have an EAP or something similar.



Creating a Psychologically Healthy and Safe Workplace

Establishing Policies and Procedures

Guiding Psychological Health

Well-defined policies are crucial for promoting psychological health within organizations, fostering a supportive environment.

Reporting Protocols

Policies should include clear reporting protocols to ensure issues are addressed promptly and effectively. The days of ‘suck it up’ are gone. We all have the right to work in a workplace that is safe and healthy. This includes issues that can trigger mental health problems, such as hostile work environment and sexual harassment.

Accessing Support Services

It's essential to provide access to support services to help individuals navigate psychological challenges.

Training and Education Programs

Psychological Health Awareness

Training programs provide essential knowledge for employees and management to recognize psychological health issues.

Fostering Well-Being

Education initiatives promote a culture of well-being, encouraging supportive environments in the workplace.

Continuous Education Importance

Ongoing training and education are crucial for sustaining a healthy organizational culture and employee satisfaction.

Promoting Open Communication and Support

Importance of Open Communication

Open communication fosters an environment where employees feel safe to express their thoughts and concerns.

Providing Support Resources

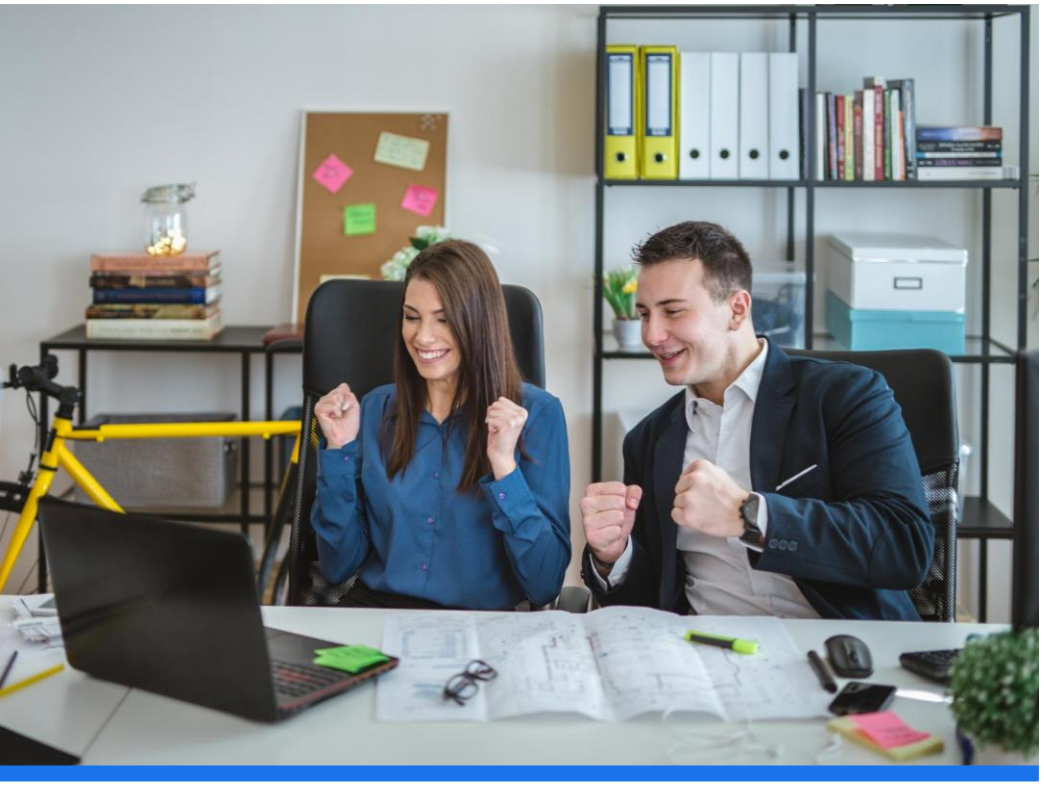
Providing resources and support can enhance employees' well-being and promote psychological safety in the workplace.

Creating Discussion Avenues

Creating avenues for discussion helps employees feel valued, understood, and connected to their team.

Benefits of Psychological Health and Safety

Improved Employee Well-Being and Productivity



Supportive Work Environment

Creating a supportive work environment fosters employee well-being and enhances mental health.

Mental Health Importance

Prioritizing mental health in the workplace leads to better focus and decision-making among employees.

Increased Job Satisfaction

When employees feel valued and supported, their job satisfaction increases, resulting in higher retention rates.

Boosted Productivity

Improved well-being directly correlates with increased productivity and better overall performance in the workplace.

Reduced Absenteeism and Turnover

Importance of Psychological Health

Focusing on psychological health can significantly reduce absenteeism, enhancing overall employee well-being and productivity.

Employee Value and Security

When employees feel valued and secure, they are more likely to remain with the company and contribute positively.

Reducing Turnover Rates

By prioritizing mental health, organizations can effectively lower turnover rates and retain top talent. Any company that has a turnover rate in double digits—that is a problem.

Enhanced Organizational Reputation and Success

Prioritizing Psychological Health

Organizations that focus on psychological well-being foster a positive workplace culture and attract top talent.

Positive Employee Perception

A strong reputation for caring about employees leads to better perception among potential hires and clients.

Driving Organizational Success

Prioritizing employee care can significantly enhance overall organizational success and performance.

Conclusion

Importance of Psychological Health

Promoting psychological health is vital for creating a supportive work environment that benefits everyone.

Enhancing Productivity

By addressing mental well-being, organizations can significantly enhance productivity and overall performance.

Employee Satisfaction

Supporting mental health leads to higher employee satisfaction and retention rates.

Discussion Topic

Recommended Cautions Using Edison Electric Institute (EEI), Safety Classification & Learning (SC) or High Energy Control Assessments (HECA) Guidelines For Arc Flash Determination

George T. Cole, Palo Verde Nuclear Generating Station

VPP Power Generation Committee, meeting 5/15/2025

PaloVerde GENERATING STATION

Recommended Cautions Using Edison Electric Institute (EEI), Safety Classification & Learning (SC) or High Energy Control Assessments (HECA) Guidelines For Arc Flash Determination

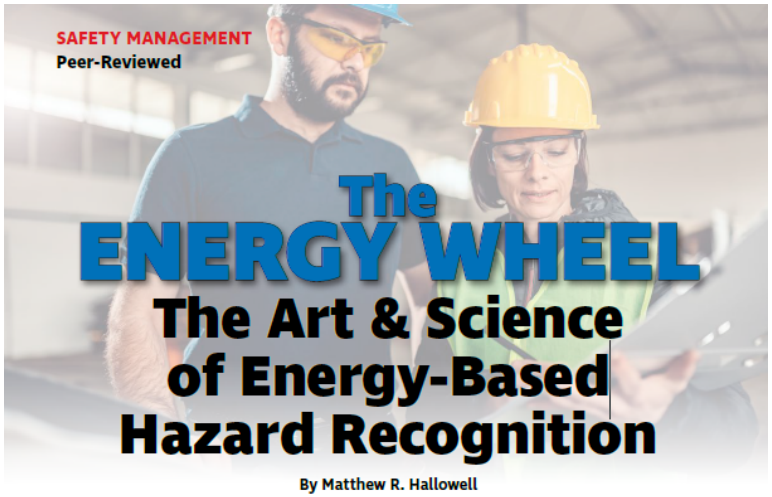
George T. Cole, Palo Verde Nuclear Generating Station

VPP Power Generation Committee, meeting 5/15/2025

PaloVerde™ GENERATING STATION

Started out as the "Energy Wheel"

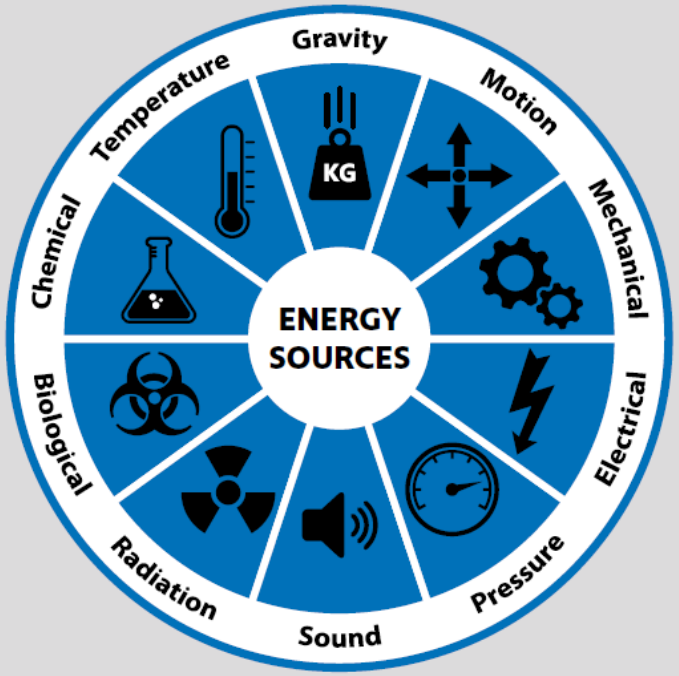
Originally started out as "Energy Based Hazard Recognition"



ASSP.Org December 2021, Professional Safety PSJ

THE ENERGY WHEEL

Each of the 10 icons in the energy wheel represents a different type of energy. Although not strictly scientific, the icons represent the most common ways that energy manifests at work.



UNDERSTANDING ENERGY WHEEL HAZARDOUS ENERGY SOURCES

Definition and examples of the 10 hazardous energy sources in the energy wheel.

Energy category	Definition	Examples
Gravity	Force caused by the attraction of mass to the earth	Uneven work surface, work at height, unsecured materials, overhead support structures
Motion	Change in the physical position or location of objects or substances	Traffic, mobile equipment, projectiles, dust particles
Mechanical	Working parts of a machine or assembly, including rotation, vibration, tension or compression	Auger, cable, chain fall, angle grinder, gears, pullies
Electrical	Presence of electrical charge or current	Wires, power lines, power tools, extension cords, transformer, relay
Sound	Audible vibration caused by the contact or two or more objects	Heavy machinery, pile driving, power tools, nail gun
Pressure	Liquid or gas compressed or under vacuum	Pneumatic tire, piping system, tank, hydraulic lines
Temperature	Intensity of heat in an object or substance	Friction, engines, sudden pressure change, steam
Chemical	Toxic objects or substances that pose health risks	Solvents, engine exhaust, silica, wood dust, liquid concrete
Radiation	Objects or substances that emit electromagnetic waves or subatomic particles	Welding, sun exposure, X-ray testing, radioactive waste
Biological	Living organisms or viruses	Bees, snakes, alligators, bears, restrooms

September 2024, EEI Released SCL & HECA Guidelines

Edison Electric INSTITUTE

Safety Classification and Learning (SCL) Model

Principal Author:
Dr. Matthew Hallowell, Technical Advisor

Revised September 2024

Edison Electric INSTITUTE

High-Energy Control Assessments (HECA)

Principal Authors:
Dr. Matthew Hallowell
Dr. Elif Deniz Oguz Erkal

September 2024

Common EEI SCL & HECA Terms & Acronyms

- **STKY** – "Stuff That Kills You"
- **SIF** – Serious Injury or Fatality
- **PSIF** – Potentially Serious Injury or Fatality
- **HSIF** – High-Energy Serious Injury or Fatality
- **LSIF** – Low-Energy Serious Injury or Fatality
- **HECA** – High Energy Control Assessment
- **SCL** – Safety Classification and Learning

- **Direct Control** – A barrier that is specifically targeted to the high-energy source

- **Exposure** – Condition where high energy is present in the absence of a Direct Control

- **High Energy** – A hazard that exceeds 500 foot-pounds of physical energy and is most likely to cause a SIF if an employee contacts the energy.

Source EEI SCL & HECA

EEI Pictograms for High Energy Hazards

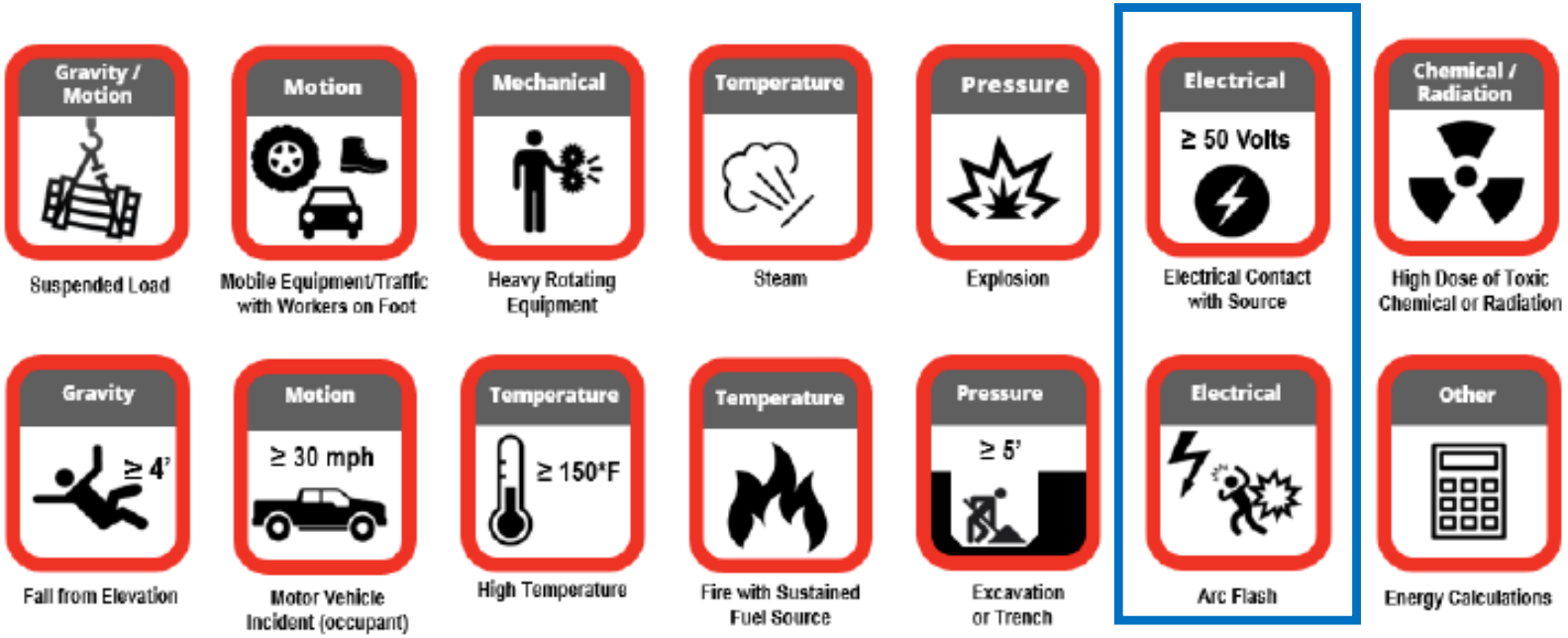


Figure 2. Example High-Energy Hazards

Source EEI HECA, Page 5, EEI SCL, Page 21

EEI HECA Electrical Hazard Pictograms

 Electrical Contact with Source	Electricity equal to or exceeding 50 volts is sufficient to result in serious injury or death according to the NFPA 70E. Electrical Contact with Source (Electric Shock) Aligns with OSHA and NFPA 70E
 Arc Flash	Any arc flash exceeds the high-energy threshold because of the voltage exposure, according to the NFPA 70E. Also, permissible distances are covered in OSHA Standard 1910.333 and section 1910.333(c)(3)(ii)(C) in particular. Arc Flash Does Not Align with Cited OSHA Regulations or NFPA 70E

Source EEI HECA, Page 17

Reasons Why EEI Arc Flash Does Not Align with NFPA 70E

EEI SCL & HECA:

"Any arc flash exceeds the high-energy threshold because of the voltage exposure, according to NFPA 70E."

2024 NFPA 70E:

Arc flash incident energy is not based on voltage exposure alone.

70E Informative Annex D – *Incident Energy and Arc Flash Boundary Calculation Methods*.

- Incident (heat) energy is calculated using several different methods
- Phase-to-phase Voltage is only one factor
- Bolted fault current
- XFMR MVA and XFMR impedance (Z)
- System MVA and system Z
- Clearing time of fault or short
- Distance worker is from arc source
- Electrode configuration/orientation
- Arc in open air or arc in a box

Reasons Why EEI Arc Flash Does Not Align with NFPA 70E – No Mention of Heat Energy

2024 NFPA 70E:

Article 100, Arc Flash Hazard – A source of possible injury or damage to health associated with the release of energy caused by an electric arc.

Article 100, Arc Flash Boundary – When an arc flash hazard exists, an approach limit from an arc source at which the IE equals 1.2 cal/cm^2 (5 J/cm^2). [~3.7 foot-pounds]

Article 100, Incident Energy – The amount of thermal energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. Incident energy is expressed in calories per square centimeter (cal/cm^2).

130.2(B)(6) Results of the arc flash risk assessment:

- Available incident energy at the working distance
- PPE to protect against arc flash hazard
- Arc flash boundary

130.4(E) IN – Electric shock protection boundaries and the arc flash boundary are independent of each other.
130.6(E)(1) – The arc flash boundary shall be the distance at which the incident energy equals 1.2 cal/cm^2.
130.7(C)(11) IN#1 – AR fabrics can reduce burn injuries during an arc flash exposure by providing a thermal barrier between the arc flash and the wearer.

Reasons Why EEI Arc Flash Does Not Align with Cited OSHA Regulation

EEI SCL & HECA:

"Permissible distances are covered in OSHA Standard 1910.333 and section 1910.333(c)(3)(ii)(C)"

OSHA 1910.333, Subpart S:

1910.333(c)(3)(ii)(C) – The person is insulated from all conductive objects at a potential different (i.e. "voltage") from that of the energized part.

OSHA Table S-5 MAD is only for Shock Protection Distance not arc flash

Table S-5 - Approach Distances for Qualified Employees - Alternating Current

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid contact.
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	l ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

EEI SCL & HECA Energy Computations?

Electrical energy, also referred to as electrostatic potential energy, poses risks primarily when charged particles are introduced into the body as an electric current. This current undergoes conversion into thermal energy as it traverses through the human body, perturbing its internal equilibrium. To facilitate the utilization of this tool for estimating electrical current, we consider the resistance of the human body as 1,500 ohms and assume that all electrical energy dissipates as heat. The magnitude of injury is directly proportional to the exposure time and it exhibits exponential dependence on the voltage. The estimation of electrical energy can be approached in two ways: by considering the current (amperage) or by examining the voltage and contact time.

Electrical energy relies on time measured in seconds (s), voltage (V), amperage (A), the assumed resistance of the human body (1,500 ohms), and the assumption that all electrical energy transforms into heat. These computations remain consistent regardless of whether SI or Imperial units are employed.

E = time x voltage2 / resistance OR **E = time x current2 x resistance**

Examples:

- Worker touches a 220V wire for 2 seconds

E = 2s x 220 V2 / 1,500 ohm = 64.6 Joules
E = 64.6 Joules x 0.74 ≈ 48 foot-pounds
Conclusion: Low energy ?

- Arc flash for 0.05 seconds inside a 10kV circuit breaker

E = 0.05s * 10,000 V2 / 1500 ohm= 3,333 Joules
E = 3,333 Joules x 0.74 ≈ 2,500 foot-pounds
Conclusion: High energy

However, if Nominal System Voltage of 240 vac is used
With 1k Ω body resistance = 240mA
With 500 Ω body resistance = 480mA
Joules = V x A x S
240V x 240mA x 2s = 115.2 Joules (~85 ft/lbs)
240V x 480mA x 2s = 230.4 Joules (~170 ft/lbs)

EEI SCL Page 27, EEI HECA Page 21

Charles Dalziel's Effects of Current on Human Body

Painful Shock (Let Go Threshold)	16.0	10.5
Painful & Severe Shock, muscles contract, breathing difficult	23.0	15.0
Possible Ventricular Fibrillation		
From short shocks (0.03 Sec.) 0.03 Sec = 1.8 cycles	1,000	1,000
From longer shocks (3.0 Sec.)	100	100
Ventricular Fibrillation, Certain Death	Must occur during susceptible phase of heart cycle to be lethal.	
From short shocks (0.03 Sec.) 0.03 Sec = 1.8 cycles	2,750	2,750
From ~~short~~ shocks (3.0 Sec.)	275	275

All values are milliampere RMS at 60 Hz.

Typo 'Longer'

Source Hubbell/Chance 'Effects of Current on the Human Body, Section 2', 2015

Gap and Inaccurate Technical Information in EEI HECA

Palo Verde identified inaccuracy and gaps with EEI SCL and HECA Guidelines related to arc flash criteria

Documented in our Corrective Action Program by

Condition Report (CR) 25-03334

2025 VPPPA Conference Schedule

- ~~Region 1 – May 5-8, Southbridge, MA~~
- Region 2 – May 20-22, Hershey, PA
- Region 3 – May 20-22, Hershey, PA
- ~~Region 4 – May 6-8, Stone Mountain, GA~~
- Region 5 – June 9-12, Indianapolis, IN
- Region 6 – May 19-22, Corpus Christi, TX
- Region 7 – TBD
- Region 8 – October 7-9, Salt Lake City, UT
- ~~Region 9 – April 15-17, San Diago, CA~~
- ~~Region 10 – May 13-15, Portland, OR~~
- **VPPPA Safety+ - August 11-14, St. Louis, MO**

2025 Meeting Schedule

~~February 13th~~ ~~May 15th~~

August 7th November 13th

Meetings are scheduled from 1430 – 1600ET
(1230 – 1400MT)