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AN EXELON COMPANY

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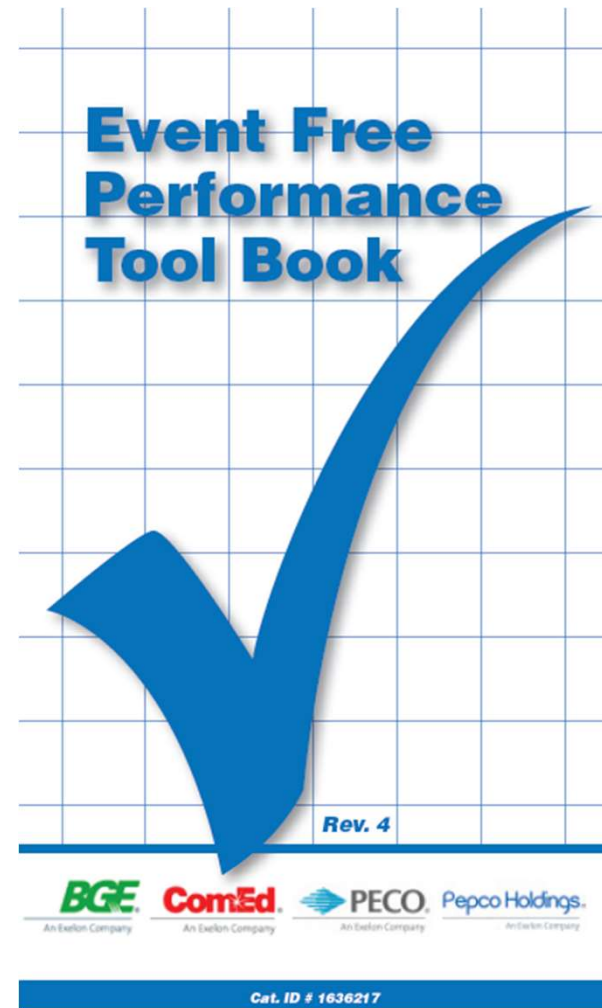
Human Performance Tools

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Event-Free Performance

The Event-Free Performance Program includes four elements

- **Prevention**
The *Event-Free Performance Tool Book* is a resource used to help recognize and address error-likely situations, thereby preventing adverse events
- **Detection**
Safety Audits & Observations during work activities help detect and correct at-risk behaviors
- **Correction**
The Corrective Action Program (CAP) and event investigations help us understand the reason why mistakes occur and allow us to address the error-likely situation that caused the event
- **Sharing**
We share lessons learned to help the organization produce better outcomes



Human Performance Tools

1. The Job Brief
2. Questioning Attitude
3. Verification Practices
4. Two-Minute Pause
5. Three Part Communication
6. Stop when unsure OOPs
7. Visual Clues/OIM tools
8. Value Based Engagement
9. Energy Wheel/Energy Based Observations
10. Precursors - Good Catch

Job Brief

- The Job Brief is a discussion that is held before a job starts, when a job changes or when work resumes after a break. All relevant aspects of the job are discussed with all the job participants.
- Multi-Person Brief
 - Person-in-charge/designated person identifies hazards and fills out as much as possible on the Job Brief.
 - Person-in-charge/designated person performs walk-down, looking for:
 - Line of fire issues
 - Additional hazards
 - Make necessary changes to ensure safety of personnel and public.
 - Everyone involved discusses the 4 Key Questions.
 - Specific Tasks are assigned
 - Person in charge completes Brief
 - Everyone meets at the end of the job to review (wrap up)



Job Brief Example



SA-PE-4024-R0014 Rev. 11 Eff. Date: 6/30/22
PECO JOB BRIEFING SHEET – T&S TESTING

Legible Employees Initials

1 st Briefing																				
2 nd Briefing																				

Date: _____ County: _____ Municipality: _____

Job Location: _____ IVR In Out

Nearest Cross Street: _____ Emergency: **Call 911**

Equipment: _____

Crew Contact Name & #: _____

Supervisor: _____ Contact #: _____

Crew Members: _____

Special Medical Concerns: _____ AED Location: _____

Work Groups Involved with the Job: _____

Brief Job Description: _____

MAKING IT READY TO WORK

Section 1: Clearance Order
 - C/O needed? No Yes C/O reviewed? Yes N/A C/O# _____ Issued to: _____
 - C/O walked down by all crew members? Yes N/A
 - Identified and isolated all non-electrical hazards (CO2, Gas, Steam, Oil, Water, etc.) per LOTO? Yes N/A

Section 2: Additional Protection Needed (Use Worker Blocker Tags as Applicable)
 Are you using Worker Alteration Log? Yes No **IF "YES"** Worker Alteration Log (WAL#) _____
 - Back feed addressed? Yes N/A - Induction Addressed? Yes N/A

Section 3: Safe Work Zone
 - Area roped off? Yes N/A - Robust barriers needed and installed? Yes N/A
TEST BEFORE TOUCH PERFORMED BY MAINTENANCE TEAM

Minimum Approach Distance
*****Circle Voltage/MAD Being Worked on*****

Qualified Electrical Workers			Non-Qualified Workers	
Required Minimum Approach Distance (MAD) from Uncovered Conductors, Phases, or Equipment			Energized Part to Individual	
Volts between Phases	Phase to Ground Exposure	Phase to Phase Exposure		
50-300 V	Avoid Contact	Avoid Contact	Up to 50 kV	10 FEET
480 V	1 ft. 1 in.	1 ft. 1 in.	69 kV	11 FEET
2 kV to 15 kV	2 ft. 2 in.	2 ft. 3 in.	130 kV	13 FEET
34 kV	2 ft. 6 in.	2 ft. 11 in.	220 kV	16 FEET
69 kV	3 ft. 3 in.	3 ft. 11 in.	500 kV	25 FEET
138 kV	3 ft. 7 in.	4 ft. 11 in.		
230 kV	5 ft. 3 in.	7 ft. 6 in.		
500 kV	10 ft. 6 in.	19 ft. 4 in.		

PERSONAL PROTECTIVE EQUIPMENT CHECKLIST - Discuss Appropriate PPE

<input type="checkbox"/> Hard Hat	<input type="checkbox"/> Low/High Volt Gloves	<input type="checkbox"/> Safety Vest	<input type="checkbox"/> Di-Electric Boots	<input type="checkbox"/> Other
<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Rescue Device	<input type="checkbox"/> Arc Flash Face Shield	<input type="checkbox"/> Rubber Blankets	
<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Work Gloves	<input type="checkbox"/> FR Hood (Balaclava)	<input type="checkbox"/> Safety-Toe Boots	
<input type="checkbox"/> Environmental	<input type="checkbox"/> Kevlar Gloves	<input type="checkbox"/> FR Clothing (2 nd Layer)	<input type="checkbox"/> Harness & Retrieval System / Trauma Straps	

"Test before touch"!!!! "Stay out of the line of fire"

Establish "Work Zone"
 Explain "Work Zone" and Discuss "Work Area" protection for vehicles and pedestrians

Are flaggers being used? Yes No Discuss traffic flow and crew expectations with flaggers TAD# _____ Refer to MUTCD

Is Line of Fire from above zone required? Yes No

4 Key Questions
 Stop – Think – Act – Review

1. What are the Critical Steps?	2. What are the Error - Likely Situations?	3. What is the Worst Thing that Could Happen?	4. What Defenses Are in Place?
1.			
2.			
3.			
4.			

Energy Hazards Present on This Job

Energy Type (Gravity)	Specific Hazard (Falling from Platform)	Energy Control (Fall Arrest Harness)
GRAVITY		
MOTION		
MECHANICAL		
ELECTRICAL		
PRESSURE		
SOUND		
RADIATION		
BIOLOGICAL		
CHEMICAL		
TEMPERATURE		

STOP -- THINK -- ACT -- REVIEW **Discuss Emergency/Environmental Response Plans**

Environmental Concerns

IF THERE IS DOUBT, CONFUSION, OR DISAGREEMENT ON COMPLETING THE TASK SAFELY, CONTACT YOUR SUPERVISOR

Testing Techniques

Discuss Secondary Blocking (DC) _____

Discuss Secondary Blocking (AC) _____

- Does the C/O include grounds? Yes No - Is there a possibility of CIRCULATING CURRENT? Yes No

- Do relays have interstater communication? Yes No - Is there hidden breaker failure logic? Yes No

- What condition should the RTU be in? Local Remote

What past mistakes have we made on similar tasks? _____

What customer considerations need to be addressed? _____ Any +1 opportunities? _____

(Circle) Important Phone Numbers (If in danger use "XRAY9") OCC Shift Manager: 610-941-1830 TSO Shift Manager: 215-841-5141

Bucks County Dispatch: 610-941-1853	OIC Desk: 610-943-5700	Facilities: 215-841-5292
Chester County Dispatch: 610-941-1818	Phila. North Dispatch: 610-941-1855	MSDS INFO: 1-800-451-8346
Delaware County Dispatch: 610-941-1851	Phila. South Dispatch: 610-941-1854	Pennsylvania One Call (POC): 811 or 800-242-1776
Montgomery County Dispatch: 610-941-1852	TSO Dispatch: 215-941-5144	Penske (Roadside assistance): 855-234-0021
Net Ops Dispatch: 610-941-1550	Limerick Emergency: 610-718-2911	Occupational Health: 1-800-558-0039
Security: 1-800-550-6154	Peach Bottom Emergency: 717-456-4911	Environmental: Call OCC
	IVR: 1-815-724-2866	

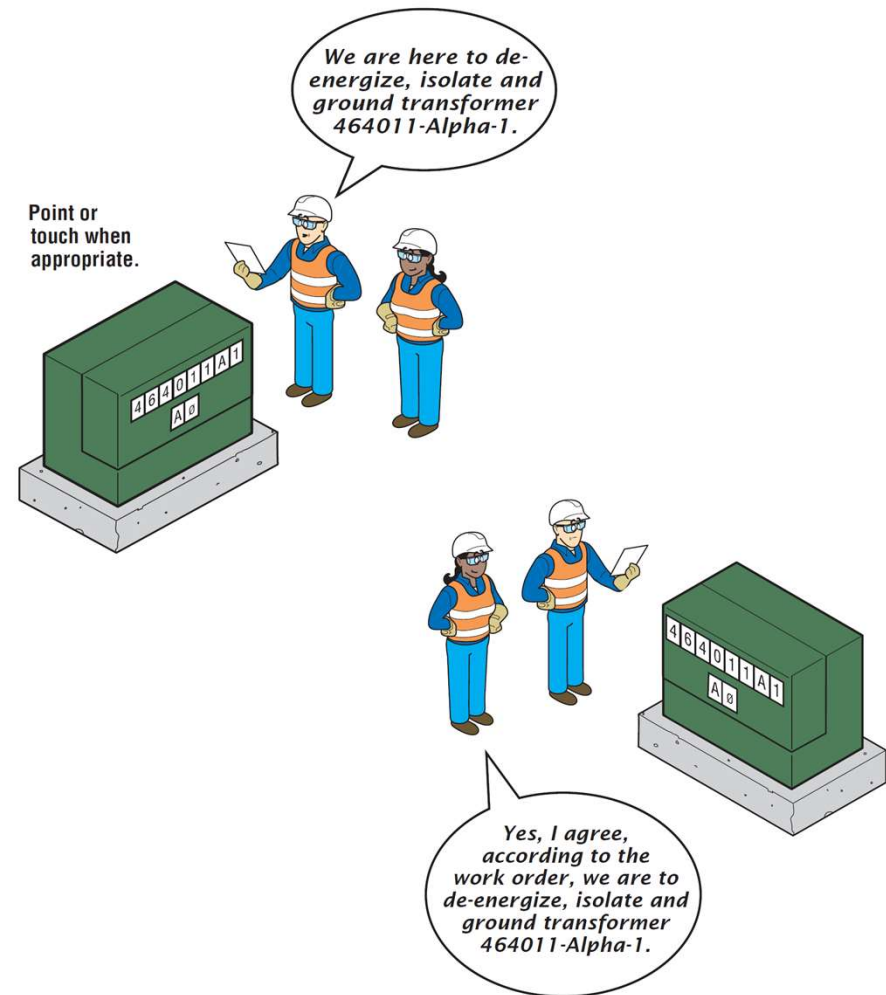
Questioning Attitude

- Empowers and encourages employees to ask questions, challenge assumptions, investigate abnormalities, and consider potential adverse consequences of planned actions
- Ask the 4 key questions
 - What are the critical steps?
 - What are the error-likely situations?
 - What's the worst thing that could Happen
 - What defenses are in place?
- These questions help employees identify hazards, error situations, critical steps and defenses, preventing injury and events.



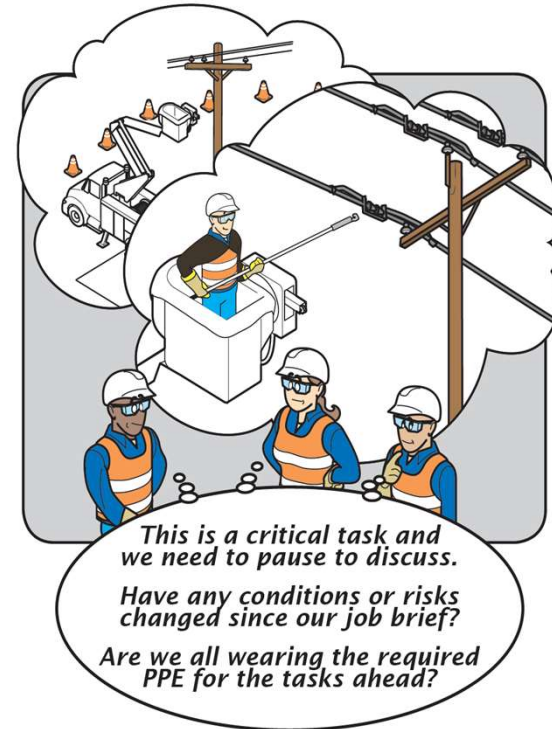
Verification practices

- Verification Practices ensure that what is intended to happen is what actually happens. It is also referred to as maintaining positive control of component condition and/or the behavior
 - **STAR** is a self-check method for making accurate decisions when working alone. Stop. Think. Act. Review.
 - **First Check** is a verbal “check-in” when working alone and PRIOR to starting a task. A knowledgeable, qualified person is contacted to confirm the employee is at the exact location and/or about to work on the correct equipment and correctly understands the task to be performed. This ensures the first manipulation is properly performed on the correct unit, account or equipment.
 - **Peer Check** Verify your actions with a second qualified person before you perform the task.
 - **Independent Review** A set of “fresh eyes” reviewing documents, calculations, computer code or operation of equipment catches errors and ensures accuracy and safety.



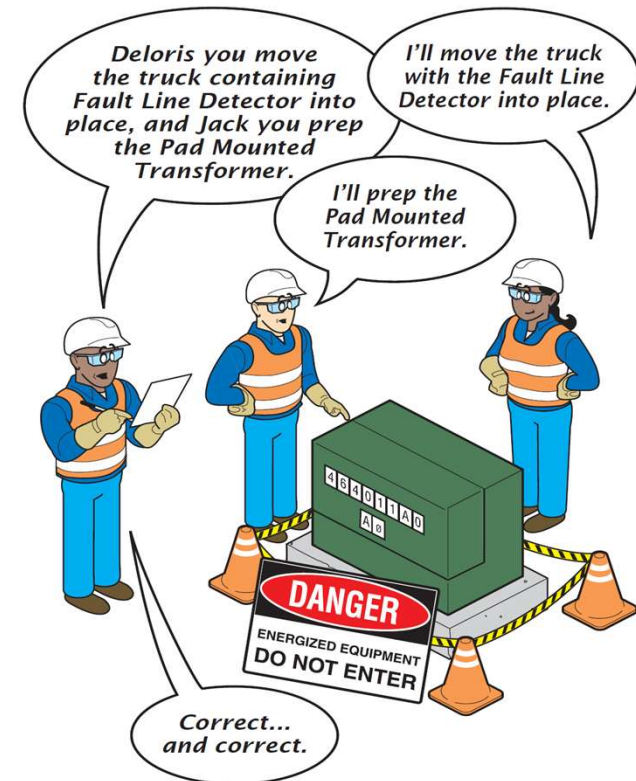
Two Minute Pause

- A work practice of pausing/stopping work prior to engaging in a critical or high-risk task(s).
- Pause and stop work prior to engaging in critical or high-risk tasks. Tasks where the Two-Minute Pause is to be used are identified during the job brief. The Two-Minute Pause should also be used to ensure that crew members are prepared for the next steps and are using the proper PPE. Make sure nothing has changed since the initial pre-job brief. Use Three-Part Communication to make sure all crew members are aware of work being performed and each crew members' responsibilities. For individuals working alone utilize a Self-Check (STAR)



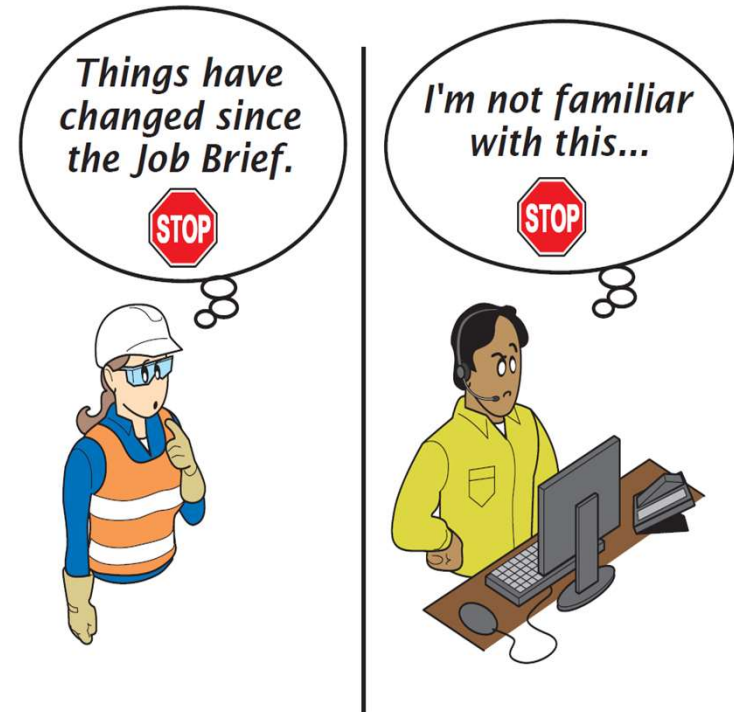
Three-Part Communication

- A method of communication that helps ensure communications are clear, concise, and free from ambiguity.
- Situations when Three-part communication is used
 - Confirming orders given, received, and their sequence during the job brief
 - Identifying equipment by proper name and ID number
 - When delivering and receiving clearance and zone of protection information from the designated authority and when sharing that information
 - During any task triggering a two-minute pause requirement
 - Confirming intention of work or actions to be completed prior to going aloft
 - Following any significant job site condition changes in scope of work



Stop when Unsure/OOPs

- Stop When Unsure/OOPS is a work practice of stopping a job when uncertainty arises, unsafe conditions are identified, or when results are not consistent with expectations. Stop When Unsure is used when performing a task without a documented procedure, parameter or process. OOPS is used when performing a task with a documented procedure, parameter or processes. If at any time you are outside of procedures, parameters or processes, stop!



Visual Cues/OIM tools

- Distinct forms of marking used to identify specific components.
- **Flagging** is the use of distinct markers to identify the components to be worked on when other similar looking components are nearby. This will ensure the correct component is manipulated.
- **Robust Operational Barriers** To ensure that workers do not work on the wrong components, use Robust Operational Barriers to mark or cover the components NOT to be worked on. Trip-sensitive or other important equipment require Robust Operational Barriers to prevent mistakes.

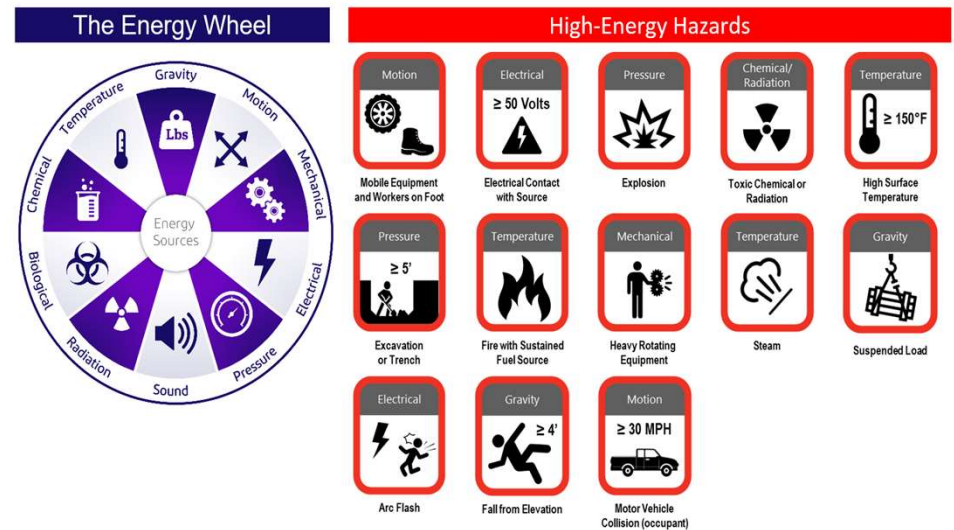


Value Based Engagement (VBE)

- Program to routinely assess the alignment of safety values across the workforce, through value based engagements, and reconcile any differences identified.
- The engagements are conversations between leaders and workers, not observations or audits of the work.
- Plan for an efficient visit: Know before-hand the work the crews will be performing to reduce any impact to productivity, determine if is better to conduct a VBE with the crew as a group or with an individual within the crew

Energy Wheel/Energy Based Observations

- The Energy Wheel is a visual tool that shows ten types of hazardous energy that may be present in the work environment. The Energy Wheel is used by searching for energy sources in each type of energy in turn.
- Energy Based Observation Process
 - Prepare for the Observation
 - Establish Connections
 - Focus on Life-Threatening Hazards and Direct Controls
 - Demonstrate Care and share expectations
 - Encourage Engagement and Feedback
 - Follow Up on the Observation.



Precursors - Good Catch

- **Precursor** is a condition or behavior that, if left uncorrected, could have led to an event.
- A **Good Catch** is if an action by an employee or contractor took proactive action above and beyond normal job expectations that prevented an event, improved a process or practice, or led to some other notable positive result.
 - Recognizes the effort of the employee or contractor
 - Subtype of Precursor



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Thank you

Transmission & Substations
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