

Human Performance Error Review Form

SHEMS Number: _____ **Employee Name or Job Title:** _____

Performance Mode: (Check the one that best represents the individual's competence level for the work)
 [Consult definitions on back of form] Skill Based Rule Based Knowledge Based

Performance Mode Comments:

Error Traps: (Select all that apply from fact finding on the incident)

<input type="checkbox"/> Time Pressure	<input type="checkbox"/> Peer or Self-Induced or Perceived Pressure
<input type="checkbox"/> Distractions or Interruptions	<input type="checkbox"/> Off- normal work time or Infrequent Conditions
<input type="checkbox"/> Multiple Tasks or Repetitive Actions	<input type="checkbox"/> Challenging or changing Physical Environment
<input type="checkbox"/> Overconfidence or Complacency	<input type="checkbox"/> Fitness for Duty: fatigue or mental stress
<input type="checkbox"/> Vague Guidance (Written or Verbal)	<input type="checkbox"/> Reliance on Memory, limited short term memory
<input type="checkbox"/> Assumptions or lack of or unclear standards	<input type="checkbox"/> Inaccurate risk perception or shortcut choice
<input type="checkbox"/> Unfamiliarity with task, first time or lack of proficiency, inexperienced	<input type="checkbox"/> Departure from routine or new technique
<input type="checkbox"/> Imprecise communication habits	<input type="checkbox"/> Confusing displays or controls or indications
	<input type="checkbox"/> Other _____

Judgment Statement on Contributions of Error Traps to this incident:

Process Issue(s):

*Error traps linked in **How to Why Matrix***

<input type="checkbox"/> Training & Qualification	<input type="checkbox"/> Pre-Job Briefing	<input type="checkbox"/> Pre-Assessment & Risk Recognition vs Job Hazards
<input type="checkbox"/> Written Guidance (Rules, Policies, Practices, and Procedures)	<input type="checkbox"/> Values & Norms	<input type="checkbox"/> Task Structure/Wk practices
<input type="checkbox"/> ES&H Expectations	<input type="checkbox"/> Roles & Responsibilities	<input type="checkbox"/> Environmental Conditions
<input type="checkbox"/> Goals & Priorities	<input type="checkbox"/> Work Planning & Scheduling including Resource Management	<input type="checkbox"/> Design/Equip. Condition
	<input type="checkbox"/> Communications _oral _written	<input type="checkbox"/> Change Management
	<input type="checkbox"/> Supervisory <input type="checkbox"/> Mgt. Methods	<input type="checkbox"/> Other _____

Process Issue Influences on the Error and Error-Proofing Opportunities Identified:

To determine which tools / techniques would have been best utilized in a particular situation, refer to **When to Use Table of Human Performance Tools & Techniques**

Human Performance Tools:	Used - Effective	Used - Not Effective	Not Used - Needed	N/A
▪ Self Checking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Peer Checking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Knowledge/Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Procedure Usage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ STAR or Take Two	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Place-keeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Effective Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Job Briefing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Coaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Turnovers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Lesson Learned Statement on Human Performance Tools Use or Failure to Use:

Human Performance Error Review Form

Guidance & Terms for Use of the Human Performance Error Review Form

An individual's error is expected to be an "honest mistake," unless this review coupled with fact finding results suggest that reckless, negligent, or willful acts may be involved, which – in such instances – may warrant a **culpability review** for possible disciplinary action.

The purpose of this form is: 1) to determine whether there were weaknesses in our processes that provide lessons learned opportunities to further error-proof them; and 2) to decide upon the extent to which the individual's error (i.e., committing an unsafe act) may have been mainly due to situations, conditions, or circumstances that promoted or enabled that behavior.

"Performance Mode" frames the individual's competence to perform without unintentional error

Performance Mode	One of three modes individuals use to process information related to one's level of familiarity and attention given to a specific task
Skill-based Performance	Behavior associated with highly practiced actions in a familiar situation usually executed from memory without significant conscious thought
Rule-based Performance	Behavior based on selection of stored rules derived from one's recognition of the situation; in the rule-based mode, typically relying on written guidance to perform the work activity
Knowledge-based Performance	Behavior based on unfamiliarity, therefore individual must rely on experience, perceptions, and perspective; (more appropriately, this describes a "lack of" knowledge such that task success can be 50% due to chance or 1 in 2 error rate is possible)

Error Traps, when they exist, can contribute to an individual making an honest mistake

Error-Traps	Work situation in which there is greater opportunity for error when performing a specific action or task due to error precursors (also known as "error-likely situations")
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When someone commits an ES&H related error, by performing an unsafe act, that "**at risk" behavior is usually a result, not a cause, when it's an honest mistake.** Therefore, **Process Issues** should be thought of in terms of identifiable weaknesses that, if corrected, can help enable others not to repeat the same error; and frequently, are more typically the causes of honest mistake errors.

To help promote a more consistent human performance review, definitions of the following terms are included.

At-Risk Behavior	Behaviors or practices, usually adopted for fun, comfort, expedience, or convenience that usually increase the chance of error
Error	An action that unintentionally departs from an expected behavior
Human Error	A phrase that generally means the slips and mistakes of human kind
Individual	An employee in any position in the organization: worker, supervisor, staff, manager, executive
Mistake	Errors committed because the intent of the act was incorrect for the work situation, typically defined by the workplace condition; incorrect decision or interpretation (See also Error and Slip)
Shortcut	A "more efficient" action as perceived by the individual, that is intended to accomplish the intent of actions other than that directed by procedure, policy, expectation, or training (See <i>Violation</i>)
Slip	A physical action different than intended (See also Error and compare with Mistake)
Violation	Deliberate, intentional acts to evade a known policy or procedure requirement for personal advantage usually adopted for fun, comfort, expedience, or convenience (See Shortcut)

Human Performance defined	In an Individual sense: A series of behaviors executed to accomplish specific task objectives (results) In the Organizational sense: The sum of what people (individuals, leaders, managers) are doing and what people have done; the aggregate system of processes, influences, behaviors, and their ultimate results that eventually become manifest in the workplace.
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Summarize Critical Steps

To aid you in determining critical steps, you can: 1) consult a JHA; 2) consider the attributes listed; and 3) review those in columns two and three of typical Distribution Line work critical steps. Blank spaces provided to write in the critical steps recognized for the work activity.

ATTRIBUTES	RECOGNIZED D-LINES	CRITICAL STEPS
-Irrecoverable Act is involved	-Energize / De-Energize Lines	-Pole Handling
-High Risk to Safety or Reliability	-Suspended Loads	-Installing Protective Barriers
-High Energy Level(s) involved	-Felling Poles or Trees	(for a layer of protection)
-Changing state of electrical equip.	-Handling or Cutting Conductors	-Area Clearing/Work Zone Control

Anticipate Error-Likely Situations

Anything can contribute to an error-likely situation... If you recognize it beforehand, it's an error **precursor**. If you don't, then you may unknowingly "allow it" to **trap** you... Review TWIN Analysis below for possible job site conditions and typical problems (top traps in bold), to identify errors that could be made during a critical step or where confusion may contribute to missing a critical step.

TWIN Analysis: To identify possible Error Precursors / Error-Likely Situations
Note: Top Error Traps in bold

Task Demands <input type="checkbox"/> Time pressure (in a hurry, often self-imposed) <input type="checkbox"/> High workload (memory requirements) <input type="checkbox"/> Simultaneous or Multiple tasks <input type="checkbox"/> Repetitive actions / Monotony Task <input type="checkbox"/> Irrecoverable actions <input type="checkbox"/> Interpretation requirements or Rule Changes <input type="checkbox"/> Unclear goals, roles, or responsibilities <input type="checkbox"/> Lack of clear standards	Work Environment <input type="checkbox"/> Distractions or Interruptions <input type="checkbox"/> Changes / Departure from routine <input type="checkbox"/> Confusing procedure / Vague guidance <input type="checkbox"/> Confusing displays / controls <input type="checkbox"/> Unexpected equipment conditions <input type="checkbox"/> Hidden system response <input type="checkbox"/> Lack of alternative indication <input type="checkbox"/> Peer Pressure or Personality conflicts
Individual Capabilities <input type="checkbox"/> Unfamiliarity with task/ 1 st time (mental model) <input type="checkbox"/> Lack of knowledge/inexperienced <input type="checkbox"/> New technique not used before <input type="checkbox"/> Imprecise communications <input type="checkbox"/> ½ hour after wake-up or a meal <input type="checkbox"/> Unsystematic problem-solving skills <input type="checkbox"/> Hazardous attitudes for critical task <input type="checkbox"/> Illness / Fatigue – Fitness for Duty	Human Nature <input type="checkbox"/> Complacency or Overconfidence <input type="checkbox"/> Habit patterns (1st day after days off) <input type="checkbox"/> Assumptions (inaccurate mental picture) <input type="checkbox"/> Stress <input type="checkbox"/> Mind set (intentions / "tuned" to see) <input type="checkbox"/> Inaccurate risk perception <input type="checkbox"/> Mental shortcuts (biases) <input type="checkbox"/> Limited short-term memory

Foresee Potential Consequences

If a mistake could occur at a critical step, ask yourselves the following two questions:

Q-1: **What is the worst that can happen?** Q-2: **What is most likely to occur?**

Remember: If the potential outcome is judged too severe or intolerable, do not proceed.

Evaluate Barriers / Defenses (multiple barriers/defenses are also referred to as *layers of protection*)

To determine what control measures, PPE, and any special safety equipment that may be needed, consider the following three questions:

- _ *What are the **hazards**?* _ What are the **risks**? _ What do we need to do to **minimize the risks** to adequately protect personnel and public?

Use the Barrier Analysis table below, to review the typical defenses you want in place.

Barrier Analysis: Defenses to Combat Error Likely Situations/Prevent Events Check those that will be in effect during your work	
<input type="checkbox"/> Trained & Qualified workers assigned <input type="checkbox"/> Personnel are fit-for-duty <input type="checkbox"/> Critical Steps (from JSA/JHA) are known and discussed in <input type="checkbox"/> Meaningful Pre-Job Brief conducted (SAFER Model) <input type="checkbox"/> Roles & Responsibilities understood by each and all <input type="checkbox"/> Peer Checker assigned (Safety Person, Attendant, Qualified Observer)	<input type="checkbox"/> Communications will use repeat backs and confirmations during critical steps <input type="checkbox"/> Workers wear PPE to protect themselves from unanticipated as well as recognized hazards <input type="checkbox"/> Everyone is willing to exhibit a Questioning Attitude; Stop When Unsure (Situational Awareness); Speak-Up and Listen-Up <hr style="border-top: 1px dashed black;"/> <input type="checkbox"/> Supervisor/Leader's field visits – Observations for Coaching

Consider when you may need to use which tool or technique, at the appropriate time, for a particular critical step or to compensate for an identified performance mode issue.

Table of <i>When to Use</i> Human Performance Tools & Techniques
Check box provided to highlight those crew or you intend to use

	Tool or Technique	When to Use	Comments
<input type="checkbox"/>	Operating Experience	Planning, PJB	Retrieve from SHEMS
<input type="checkbox"/>	TWIN Analysis	Planning, PJB	To keep precursors from becoming error traps
<input type="checkbox"/>	3 Question Technique	Prep, PJB, Field Work	Can use almost anytime
<input type="checkbox"/>	Training/Qualification	Work preparation	Trained & Proficient for Skill- or Rule-based
<input type="checkbox"/>	Job Hazard Analysis	Planning, PJB	Great source to identifying critical steps + PPE
<input type="checkbox"/>	Peer Checking	Field Work	Crew members are willing to Speak-Up ?
<input type="checkbox"/>	Pre-Job Brief	Pre-job	Enables work to be done safely & successfully
<input type="checkbox"/>	STAR	Field Work	Self-Checking tool to Stop-Think-Act-Review
<input type="checkbox"/>	Stop & Collaborate	Field Work	Anytime questions, concerns or feeling uneasy
<input type="checkbox"/>	Time Out	Field Work	Like STAR, anytime when uncertain STOP
<input type="checkbox"/>	Verbalize	Field Work	Helps communication & peer checking
<input type="checkbox"/>	3-Way Communication	Field Work	Repeat backs and Phoenetic Alphabet use
<input type="checkbox"/>	Field Observations	Field Work	Reinforce safe work
<input type="checkbox"/>	Post-Job Critique	Post-job	Identify Lessons Learned to further error proof

Review Operating Experience

For work activities involving typical critical steps, consider reported events that have occurred over the past quarter. For less frequently performed work, you may wish to search for related events over the past year.

GLOSSARY OF HUMAN PERFORMANCE TERMINOLOGY

Active Error	Errors that change equipment state or system configuration triggering <u>immediate</u> undesired consequences
Alignment	The ongoing adaptation of organizational processes and values to foster desired individual behaviors and results
Anatomy of an Event	<p>A cause-and-effect illustration of the <u>latent origins</u> (linkages) of serious injury events initiated by human error.</p> <p>Factors involved, under the influence of the organization's Vision, Beliefs, and Values: Initiating Event, Failed Defenses or Barriers, Error Precursors, and Latent Organizational Weaknesses</p>
Behaviors	An individual's actions while working; what you see or hear
Causal Factors	<p>What influences people to make a "poor" risk choice or fail to recognize and/or catch themselves before making an error:</p> <ul style="list-style-type: none">• Poor Communication• LTA Pre-Job Briefing• Time Pressure (self-induced)• Peer Pressure• Bad habits / habit intrusion• Lack of Accountability• Inadequate Training• Confusing written guidance• Poor memory• Lack of co-worker engagement (didn't speak-up or have a questioning attitude)
Critical Step	<p><i>A task action that, if done incorrectly or not at all, would result in an unrecoverable condition that prevents successful job completion. As such, not all steps are equally important. Critical steps include things like:</i></p> <ul style="list-style-type: none">– Actions aimed at changing the state of the electrical system or components– Steps that are irrecoverable or actions that cannot be reversed– Steps where the outcome of an error is intolerable for personnel safety or public safety or the safety & reliability of our distribution & transmission systems
Critical Steps	<p>Steps in the job completion process that if performed incorrectly or not at all would impact safety, productivity, quality, and/or reliability. Steps that create a point of no return:</p> <ul style="list-style-type: none">▪ What is going to happen – is going to happen▪ Not all steps are critical▪ Are actions in which the level of risk to both safety & reliability is increased▪ Have consequences that are irrecoverable & intolerable▪ Their safe execution depend mainly on the Individual

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Culpable	Deserving blame; blameworthy
Defenses	Measures that <u>protect</u> against various hazards, mitigate the consequences of a hazard, or promote consistent behavior; also known as barriers
Enablers	A specific set of behaviors used by leaders to align organizational processes and values with desired individual behavior
Error	An action that unintentionally departs from an expected behavior according to some standard
Error Mode	The prevalent way an error can occur for a specific performance mode
Error Precursors	Unfavorable prior conditions that reduce the opportunity for successful behavior at the jobsite
Error Prevention Tools (main ones)	<ul style="list-style-type: none">✓ SAFER✓ Pre-Job Brief✓ 3QT, Three Question Technique✓ Self-checking, including STAR✓ Peer-checking✓ 3-way Comm.s✓ Questioning Attitude✓ Procedure Use & Adherence
Error-likely Situation	<p>A task-related predicament involving a <u>potential error</u> provoked by unfavorable jobsite conditions (error precursors) that reduce the chances for success.</p> <p>Error-likely situations have 3 components: 1) The individual, 2) The presence of error precursors, 3) An action that needs to be taken</p>
Event	An undesirable incident with adverse consequence
Event Prevention Framework	A <u>mental</u> framework that aids individuals in identifying error-likely situations, potential consequences, and flawed defenses <u>before</u> a specific task is conducted, so that appropriate actions can be taken pro-actively to prevent error or an event
Fallibility	A fundamental, <u>internal</u> characteristic of human nature to be imprecise
Flawed Defenses	Defects with defensive measures that, under the right circumstances, may fail to protect equipment or people against hazards or to prevent the occurrence of active errors, violations, or at risk behaviors

GLOSSARY OF HUMAN PERFORMANCE TERMINOLOGY

Front-line Worker	An individual directly involved in operation or maintenance; people who regularly handle tools and manipulate electrical equipment .
Human Nature	<u>Generic</u> traits or dispositions of being human; human limitations that may incline individuals to err under certain unfavorable conditions
Human Performance	A series of behaviors an individual executes to accomplish task objectives (results) according to some standard
Human Performance Principles	<ul style="list-style-type: none">☑ Humans are fallible. People are fallible, and even the best people make mistakes.☑ Error is predictable. Error-likely situations are predictable, manageable, and preventable.☑ Organization influences behavior. Individual behavior is influenced by organizational processes and values.☑ Behaviors are reinforced. People achieve high levels of performance due largely on the encouragement and reinforcement received from leaders, peers, & subordinates.☑ Events are avoidable. Events can be avoided by understanding the reasons mistakes occur and applying the lessons learned from past events (or errors).
Human Performance System	A “systems” perspective on the context of individual human performance; shows how individual performance is inter-related with organizational processes and values
Individual	An employee in any position in the organization
Individual Capabilities	<u>Unique</u> mental, physical, and emotional abilities of a particular person assigned a specific task
Initiating Action	An action by an individual, either correct or in error, that results in an event. This includes active errors that have immediate, observable, undesirable outcomes
Key Defense Analysis	A set of questions to identify: <ul style="list-style-type: none">• defenses for error-likely situations and worst-case consequences• defenses important for task completion• missing or flawed defenses
Knowledge-based Performance	Behavior in response to a totally <u>unfamiliar</u> situation relying on one’s understanding and recollection of knowledge of the system, system’s present state, and scientific principles and fundamental theory related to the system

GLOSSARY OF HUMAN PERFORMANCE TERMINOLOGY

Latent Condition	The <u>undetected</u> conditions created by latent errors, i.e., organizational weaknesses, flawed defenses, or error precursors
Latent Error	An error resulting in undetected organization-related weaknesses or equipment flaws that lie dormant (typically by management or staff)
Latent Organizational Weakness	<p>Undetected deficiencies in the management control <u>processes</u> or <u>values</u> creating workplace conditions that either provoke error or degrade the integrity of defenses.</p> <p>Also known as “human performance process issues” which typically involve some recurring items involving: training, written guidance (i.e., procedures and instructions), values & norms, goals & priorities, task structure, planning & scheduling, or roles & responsibilities,</p>
Leader	An <u>individual</u> who takes personal responsibility for his or her performance and field performance, and attempts to influence the processes and values of the organization
Mental Model	A structured organization of knowledge (usually in terms of generalizations, assumptions, pictures, or key words) a person has about how something works
Non-Compliance Index	Non-Compliance Index = $\frac{\text{Burden} + \text{Inducement}}{\text{Risk} + \text{Peer Check}}$
Organization	A group of individuals with a shared purpose (mission) and means instituted (processes) to efficiently apply resources toward the safe and reliable (values) design, construction, operation, and maintenance of the AEP Ohio Electrical Distribution System
Performance Mode	<p>One of three modes a human being processes information based on one's level of familiarity and attention given to a specific task:</p> <ul style="list-style-type: none">• skill-based• rule-based• knowledge-based
Principles	A set of <u>underlying truths</u> that can be used to guide both individual performance and the management of human performance
Pro-active	Taking action to prevent an event or an error by identifying and correcting the organizational contributions to its own problems <u>before</u> they occur
Reactive	Taking corrective action only when <u>triggered</u> by an event, error, or near miss

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Rule-based Performance	Behavior based on selection of <u>stored rules</u> derived from one's recognition of the situation; follows IF (symptom X), THEN (situation Y) logic
SAFE	An approach (SAFE) that uses task characteristics (TWIN) to systematically guide an individual(s) anticipation of critical steps, possible <u>error-likely situations</u> , <u>potential consequences</u> , and <u>flawed defenses</u> before a task is performed
SAFER Model	Used during the planning phase, an initialism that represents: <u>S</u>ummarize critical steps <u>A</u>nticipate error-likely situations <u>F</u>oresee consequences <u>E</u>valuate defenses <u>R</u>evue operating experience
Self-Checking	Is a tool that helps you focus on Critical Steps by raising the level of individual awareness ; Creates deliberate thought prior to the performance of a Critical Step ; Creates an understanding of the expected outcome; Means to verify results; Is performed in addition to a thorough job briefing
Skill-based Performance	Behavior associated with highly practiced actions usually executed from memory <u>without significant conscious thought</u> in a familiar situation
STAR	Stop -- Pause to focus your attention. Think -- Understand what is being done, plan your actions, consider expected results, and decide what to do if expected results do not occur. Act -- Carry-out the work activity, as planned. Review -- Verify that results occur as expected. If unexpected, take action as planned.
Strategic Perspective on Human Performance	<i>Re + Md</i> → <i>ØE</i> is an often seen formula used to reflect that: Reducing Error and Managing Defenses leads to Zero Events
Task Demands	<u>Specific</u> mental, physical, and team requirements necessary to accomplish a particular task successfully

GLOSSARY OF HUMAN PERFORMANCE TERMINOLOGY

Task Characteristics Inherent attributes of any task that can be used to describe a specific task situation; conditions usually grouped into one or more of the following attributes:

- task demands
- individual capabilities
- work environment
- human nature

Task Demands Error Precursors

Three Question Technique, 3QT Question to ask before you start work:

1. What are the **critical steps** of the work activity ?
2. How can I make a **mistake** ?
3. What **bad things** can happen ?

X. What defenses are in place (admin., equipment, PPE)

These can and should always be covered in a pre-job brief.

TWIN Analysis Error Precursors typically grouped under one of four areas:

Task Demands

Work Environment

Individual Capabilities

Human Nature

Violation A deliberate deviation from an expected behavior

Vulnerability Susceptibility to external conditions that aggravate or exceed human limitations, enhancing the potential to err

Work Environment General influences of the workplace, organizational, and cultural conditions that affect individual behavior