REDUCING THE FREQUENCY and LOWERING THE SEVERITY of HUMAN ERROR
IMPROVING EMS RELIABILITY

DECISION-MAKING FACTORS

Perceptions of Risk/Risk Taking/Risk Aversion

Task Design/Management of Change

Empowerment/Autonomy/Authority

Workgroup Dynamics – Participation/Peer Pressure/Conflict Resolution

Leadership

Education/Training/Aptitude

Organizational Culture – Integrity/Ethics/Value of Safety

Accountability/Expectations/Performance Criteria

Interpersonal Dynamics – Heredity/Culture/Personality/Attitudes/Habits

Communication

Mental and Emotional State/Consciousness/Situational Awareness

Allied Safety Associates

OPTIMIZE HUMAN PERFORMANCE
Symptoms are misleading

- Mistakes
- Violations
- Injuries
- Near-Hits
- High potentials
- Waste
- Inefficiency
- Reliability
- Outage
- Lost income

OP focuses on the causes

- Situational Traps
- Drift Traps
- Leadership
- Culture
- Job Scoping
- Ineffective use of Tools
Brilliantly simple – profoundly impactful!

WII-FM
HOME - FAMILY
VISCERAL
OP WORKS
CUSTOMIZED

IMPROVING EMS RELIABILITY

Operations IT
- Human Performance
- Student Workbook

Allied Safety Associates
OPTIMIZE HUMAN PERFORMANCE
SITUATIONAL TRAPS

DRIFT TRAPS

Decision Making

HUMAN PERFORMANCE

ACTIVITY/WORK

TOOLS

oops
The core of OP is **PEOPLE**:

- **People** are going to make mistakes.
- **Error-likely** situations can be predicted and events can be eliminated.
- **Organizational** values strongly influence performance.
- **Positive** and negative reinforcement determine behavior.
- **Learning** from the past will stop future events.
- **Everyone** can benefit from OP!
TRAPS

Situational Factors are traps that exist at a given point in time and affect individuals while performing a task, which can increase the chance of making an error.

Normalized Drift are traps in the form of weakness and breakdowns in organizational and personal defenses that become accepted over time, resulting in sub-standard performance, increased risks, and adverse events.
TRAPS

**Time Pressure**
Pressure exerted, whether perceived or real, to accomplish a task within a set period of time.

**Multiple Tasks**
Too many activities going on at the same time.

**Vague Guidance**
Unclear instructions, whether written, demonstrated, or spoken.

**Distractions / Interruptions**
Being physically or mentally separated from the task.

**Overconfidence**
Overestimation of one’s performance, ability, level of control, or rate of work.
First Shift/Late Shift
Early/late in one’s work schedule, or last day before or first day back from holidays/vacation/illness

Scope Change
Conditions outside of routine or expected patterns

Mental Fatigue/Stress
The consequence of the failure to respond adequately to mental, emotional, or physical demands, whether actual or imagined

Peer Pressure
Influence exerted by a peer, or peer group, in encouraging a person to change his or her attitudes, values, or behavior

Physical Environment
The work space where you will be performing a task
NORMALIZED DEVIATION

When variations in accepted standards, processes, and practices don’t result in serious consequences and, over time, become the new norm, allowing risk to increase.

- Individual – Group – Systemic
- “Temporary” becomes long-term
- Short Cuts
- Extend PM to cut costs
- “Learn to live with it”
- Condoning

- Unacceptable risks become acceptable, over time
- Hard to find, easy to ignore
- Growing tolerance for things that are not right
- Under the radar of audits
The distinction between "likelihood" and "consequences"

How do you make decisions?

Drift and Risk grow proportionately.
Situational Factors are traps that exist at a given point in time and affect individuals while performing a task, which can increase the chance of making an error, and include the following:

Normalized Drift are traps in the form of weakness and breakdowns in organizational and personal defenses that become accepted over time, resulting in sub-standard performance, increased risks, and adverse events.
Normalized Drift

Traps in the form of weakness and breakdowns in organizational and personal defenses that become accepted over time, resulting in sub-standard performance, increased risks, and adverse events.

1. **Conflicting Values** – when stated organizational principles and values do not match actual performance
2. **Condoning** – tacit approval of unacceptable deviations
3. **Bad Habits** – short cuts, complacency, wrong perceptions of risk, thrill seeking
4. **Vague Policies** – misunderstood and inconsistently applied
5. **Ineffective Training** – improved job performance not realized
Normalized Drift

**Traps** in the form of weakness and breakdowns in organizational and personal defenses that become accepted over time, resulting in sub-standard performance, increased risks, and adverse events.

6. **Flawed Procedures** – needed but missing, incorrect, unclear

7. **Faulty Equipment** – broken, out of date, inaccurate

8. **Technology** – failure to take advantage of technology

9. **Design/Engineering** – inaccurate drawings, component labeling, unapproved modifications

10. **Lack of Accountability** – Focus is on results rather than how achieved; expectations not clear
**Questioning Attitude**
Continually ask questions to fully understand what we are doing

**Self-Check**
Consciously and deliberately focuses attention on intended action and expected response before performing the task

**Peer Checking**
A 2nd person checks the correctness of another person’s actions prior to the action being implemented

**TOOLS**

**Pre-Job Brief**
Discussions of an activity right before it is performed to manage risks

**Effective Communications**
Communicating effectively by using a set of methods and techniques to reduce error potential
**Performance Coaching**
Being ready, willing and able to give and accept constructive feedback.

**Procedure Usage**
Understanding the procedure’s intent and purpose, and following all actions as written in the sequence specified.

**Post-Job Review**
Used to provide feedback on initiation, planning, execution, and control of work, and to evaluate Traps and Tools.

**Tools**

- **Place-Keeping**
  Clearly marking instructional steps being used to control a task to indicate the completion status of the step.

- **Turnover**
  Transfer of task information from one shift/individual to another to create awareness of current status.
# Optimize Performance Error Review (OPER) Form

<table>
<thead>
<tr>
<th>General</th>
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</thead>
<tbody>
<tr>
<td>Reviewer:</td>
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<tr>
<td>Person(s) interviewed:</td>
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<tr>
<td>Brief description of incident:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Situational Traps</th>
<th>Which OP Situational Traps were present? (Check all that apply)</th>
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<td></td>
<td>Peer Pressure</td>
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<td>First Shift/Late Shift</td>
<td>Mental Stress</td>
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<tr>
<th>OP Error Prevention Tools</th>
<th>Which OP Tools were used effectively?</th>
<th>Used, but not effectively?</th>
<th>Not used, but were needed?</th>
<th>Not applicable?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questioning Attitude</td>
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<td>Self Checking</td>
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<th>Normalized Drift Traps</th>
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<tbody>
<tr>
<td>Ineffective Training</td>
<td>Conflicting Values</td>
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<tr>
<td>Flawed Procedures</td>
<td>Faulty Equipment</td>
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<tr>
<td>Bad Habits</td>
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<tr>
<th>ND Traps &amp; Error Types</th>
<th>Description of ND Traps:</th>
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<tr>
<td>Are ND Traps applicable to other business units?</td>
<td>Yes</td>
</tr>
<tr>
<td>Error Type:</td>
<td>Skill based</td>
</tr>
<tr>
<td>CA's</td>
<td>Have corrective actions been initiated?</td>
</tr>
</tbody>
</table>

| NOTES |  |  |  | |
|-------|---|---|---|
Case – 3)
An Energy Management System (EMS) Operations Analyst notified an on-duty System Coordinator of a desired database update and failover. After concurrence with the on-duty System Coordinator and notification of affected parties, the Operations Analyst proceeded to setup the maintenance workstation in preparation for the failover to the backup SCADA server from the on-line SCADA server. The maintenance workstation is connected to the real-time system, but has the ability to separate its EMS functionality from the real-time databases for validating and staging database updates.

The Operations Analyst had two remote desktop sessions open, one for online SCADA server and other for backup SCADA server in addition to having a third desktop window integral to the maintenance workstation. The Operations Analyst proceeded to change the maintenance workstation’s database mode from “remote” online to “local” offline mode to complete final database modifications before the failover.

However, because of identical screens, the mode change and database modifications were inadvertently performed on the on-line SCADA server database instead of maintenance workstation’s database, causing the frontend processor (FEP) processes to stop polling RTUs and disabling failover functionality which resulted in a loss of SCADA monitoring and control of BES facilities.

**Corrective Actions/Lessons Learned:**
Implement unique background identifiers to distinguish each SCADA server from the local maintenance workstation to provide heightened awareness.
Develop and implement a formal procedure and checklist for SCADA database staging and implementation. This procedure and checklist will include, but not be limited to:

- All steps required to implement a SCADA database update on the on-line system.
- Notification protocols throughout the EMS on-line SCADA maintenance activities.
# Optimize Performance Error Review (OPER) Form

**Reviewer:**

**Date:**

**Person(s) interviewed:**

**Brief description of incident:**

### Which OP **Situational Traps** were present? (Check all that apply)

- Distractions / Interruptions
- Overconfidence
- Scope Change
- Physical Environment
- Time Pressure
- Vague Guidance
- Peer Pressure
- Multiple Tasks
- First Shift/Late Shift
- Mental Stress

### Which OP **Tools** were used effectively?

- Questioning Attitude
- Self Checking
- Pre-Task Review
- Place Keeping
- Procedure Usage
- Peer Check
- Post-Job Review
- Effective Communication
- Turnover
- Coaching

### Which OP **Normalized Drift Traps** were identified? (Check all that apply)

- Ineffective Training
- Conflicting Values
- Flawed Procedures
- Faulty Equipment
- Bad Habits
- Technology
- Vague Policies
- Lack of Accountability
- Condoning
- Design/Engineering

### Description of ND Traps:

- Are ND Traps applicable to other business units?  
  - Yes
  - No

### Type of Error:

- Skill based
- Rule based
- Knowledge based

### CAs Have corrective actions been initiated?

- Yes
- No

### NOTES
Applying the strategies and methods of Human Performance will dramatically improve EMS Reliability by reducing...

HUMAN ERROR

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