

## **Optimizing Human Performance: Reduce Errors – Eliminate Events**

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### **Introduction**

Human error is inevitable and caused by complex factors. Optimizing Human Performance (OP) is a risk-based process that prevents, detects, and controls human error before adverse events occur. Optimizing Human Performance is used in all business functions to improve safety, reliability, and productivity. More importantly, OP can become a visceral mindset and life style on a personal level as people apply the improvement methods off the job, and with their families and friends.

OP is an innovative, yet practical, set of strategies that have been proven in the field. Once learned, these strategies improve all aspects of operational performance. When applied, OP changes culture. The methodologies are brilliantly simple, yet profoundly impactful.

Optimizing Human Performance is a risk-based, process-driven system that takes into account human error, hazards and specific mitigation strategies to reduce those risks. Human Performance was first developed in the nuclear power industry and the nuclear Navy, and refined in the aviation industry and the military. Regulatory agencies are embracing human performance concepts and have aggressively begun incorporating them into regulations.

Optimizing Human Performance methods include:

- A set of well defined “Tools” that act as mental PPE to prevent errors and adverse events.
- Recognition of “OP Traps” that create error-likely situations. Both Situational Factor Traps and Normalized Drift Traps are identified and mitigated with OP “Tools”.
- Error and Event Root Cause Review that evaluates how OP Tools/Traps can be mined to prevent recurrence and generate concrete and applicable lessons learned.

### OP Principles

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!

OP addresses different types of errors, and differentiates between errors or mistakes, and violations as follows:

Error – an action that *unintentionally* departs from an expected behavior according to some standard. A lapse, slip, or other mistake that causes a person to not be successful.

Active Error:

Errors that happen at a given point in time triggering immediate undesired actual or potential consequences.

Hidden Error:

Errors resulting from undetected or uncorrected flaws in organizational or personal defenses that lie dormant until they trigger an event.

Violation - when people choose to do the wrong thing and depart from a rule or accepted standard. These are not errors. Optimize Performance is designed to minimize the frequency and severity of errors. Therefore, violations are not part of the OP process.

OP promotes a “just culture” within a “learning organization” where admission and reporting of errors and mistakes are encouraged so that root causes can be corrected. All too often, errors and violations are responded to with the same type of harsh punishment. These negative outcomes discourage error reporting, driving this valuable information underground, and preventing learning from human error cause analysis.

While the difference between error and violation may appear black and white, in reality the difference can become gray. When one or more employee(s) are involved in a violation, they often respond that they didn't know or understand. The test used to discern reality is to ask this question: “For the vast majority of employees, under the same or similar circumstances, if they wanted to do it right, could they?” If the answer is yes, then it's likely a violation. If the answer is no, then it's likely an error. Even if the action is determined to be a violation, determination of what motivated the employee(s) to commit the violation is essential. Many believe that meting out harsh discipline/punishment will solve the problem – it will not! The problem will not be solved until the reasons for the violable action is determined and addressed, and there can be many reasons that motivate employees to commit violations, and not perform to desired standards.

### OP Traps

OP recognizes a complex variety of 20 traps that place individuals and groups in error-likely situations. The OP Traps are separated into two groups, Situational Factors, and Normalized Drift:

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

1. **Time Pressure** – pressure exerted, whether obvious or concealed, self-imposed or system-imposed, to accomplish a task within a set period of time
2. **Distractions/Interruptions** – being physically or mentally separated from the task
3. **Multiple Tasks** – too many activities going on at the same time
4. **Overconfidence** – overestimation of one’s performance, ability, level of control, or rate of work
5. **Vague Guidance** – unclear instructions, whether written, demonstrated, or spoken
6. **First Shift/Late Shift** – early/late in one’s work schedule, or the first day before or after a holiday, vacation, or other time away
7. **Peer Pressure** – influence exerted by a peer, or peer group, in encouraging a person to change their attitudes, values, or behavior
8. **Change/Abnormal** – conditions outside of routine or expected patterns
9. **Physical Environment** – conditions within the work space where one will be performing a task
10. **Mental Stress** – a compromised state of mind that limits a person’s ability to focus and make correct decisions

**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 and adverse events.

1. **Conflicting Values** – when stated organizational principles and values do not match actual performance
2. **Condoning** – tacit approval of unacceptable deviations justify
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
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

Recognition that these OP Traps exist and when they are increasing the risk of an error is important to heighten one’s level of awareness. Far more important is understanding and using the OP Tools that will protect against errors and events.

### OP Tools

The most critical component of Optimizing Human Performance is understanding and using the 10 OP Tools. While these tools may seem intuitive and “common sense”, they are quite difficult to perfect in practical use. Similar to learning to play a musical instrument or become advanced in an athletic sport, a great amount of practice is required. Proficiency will not be attained by reading about the subject, watching training videos, or using buzz words in speech. There is no short cut; practice is the only way to realize the powerful benefits of OP.

OP Tools are a set of thought-provoking defenses that will prevent, predict, or reduce the likelihood of errors and events. The 10 OP Tools are:

1. **Questioning Attitude** - a constant state of mind that: knows that “it can happen to me”; asks “what if?” before acting; and, is not overconfident and resists a false sense of being right.
2. **Job Planning Analysis** - used to analyze the big picture risks of a job.
3. **Pre-Task Brief** – used just prior to performing the task to acknowledge the OP Traps that create error-likely situations, and how to apply OP tools to prevent error.
4. **Self-Check** - the last line of defense performed on the immediate task at hand in real time.
5. **Procedure Usage** - written forms of communication detailing step-by-step how to perform a task.
6. **Placekeeping** – a preferred method using circle and slash to keep track of the proper sequence of performing work tasks.
7. **Peer Check** - in-process second check of intent and actions.
8. **Effective Communications** - a set of verbal messaging principles and specific techniques called “closed-loop communications”.
9. **Post-Job Review** - an opportunity to collaborate on ways to improve a task after it has been performed.
10. **OP Coaching** - employees being ready, willing and able to **give** and **accept** constructive feedback is one of the most powerful and effective ways to improve workplace safety and reliability.

The understanding and use of these tools have been proven to reduce the frequency and lower the severity of human error. Significant effort is needed to develop proficiency in the techniques and methods that allow the tools work on an individual and group/organizational level.

### Error Review

A highly effective and easy to use error review process has been developed and used on hundreds of cases. This error review process is becoming a valuable component of comprehensive root cause analyses. After an event occurs, facts are determined to establish what happened. Then, OP application can be used to evaluate:

- OP Traps that were present that increased the likelihood of human error;
- OP Tools that were used effectively, or used but not effectively, or not used but needed.

The error review process is extremely accurate in focusing on key causal factors that greatly influenced the event, and that lead directly to root causes that must be fixed to prevent recurrence.

## **Conclusion**

The benefits of Optimizing Human Performance can be realized by individuals and organizations on and off the job. OP Traps increase the risk of error-likely situations. Situational Factors affect individuals at a given point in time, whereas Normalized Drift are traps in the form of weakness and breakdowns in organizational and personal defenses that become accepted over time. Both sets of OP Traps result in sub-standard performance and adverse events.

OP Tools are a set of thought-provoking defenses that will prevent, predict, or reduce the likelihood of errors and events only after the methods and techniques are fully embraced, learned and practiced.

A simple, but highly effective Error-Review Process is a critical component of the Root Cause Analyses that helps determine OP Traps that created error-likely situations, and OP Tools that could have helped predict or mitigate the circumstances that resulted in the event.

Improvements will be widespread and widely recognized. The frequency of human error will be reduced as will the severity of the effects of human error be lowered. Safety will improve, reliability will be increased, productivity will rise, and people's lives will be enriched.