

## LUCAS OPT HOP TOOLKIT

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This resource represents more than a decade long effort to field test various error reduction practices shared with and by clients of Lucas OPT. The tools are divided into 3 categories: Leadership, Organization and Individual and can be used without written permission by your organization to implement and improve the practices that create and sustain a safe, productive, and resilient work environment. For additional ideas on how to build expertise and reduce errors in work planning, project management and task execution, contact one of our Specialists at [www.lucasopt.com](http://www.lucasopt.com).

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## Procedure Use and Adherence

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### Purpose

Problems with procedures are varied. Is the procedure writer in the field when writing the procedure? When using equipment guided by an operating manual, can a worker use the manual as intended? Does the person completing the procedure for another user have any familiarity with the job being performed?

In a Federal Aviation Administration document, "Failure to Follow Written Procedures," identified errors in following written procedures as contributing factors of significant events involving two airline companies.

The report reviewed 154 "failure to follow procedures" events with the primary reason being Procedure Documentation-*documents were not readily available, not up to date, and poorly written. Procedure documentation errors accounted for 58% of the events.*

Procedures include more than physical documents. Most skill-based activities require the use of mental, not written procedures. These procedures can be equally 'wrong for the job and used in the wrong way' just as written work documents are.

### When

Anytime a procedure is introduced into a work scope, procedure use and adherence should be followed. The procedure should be reviewed prior to the actual work, and it must be understood by anyone using it. If at any time the procedure cannot be used as it is written, the work should be stopped until the procedure can be used.

### The 7 C's

If a procedure needs to be reviewed, the 7 C's should be used each time. The 7 C's are:

- Context: The procedure should only contain content applicable to the specific task
- Consistency: Action words, warning or caution words, and the format of the steps needs to be consistent throughout the procedure
- Completeness: Every step should be planned out until the tasks can be complete without question
- Control: Users should be called out prior to the action statements so everyone knows who is responsible
- Compliance: The content within the procedure should be referenced with any company or federal/state rules and regulations, and should no contradict any of these
- Correctness: Diagrams, equipment labels and other identifiers must match the actual components in the field or facility
- Clarity: Each procedure user should have the same level of understanding of the procedure, with no questions during the work scope

## Questioning Attitude

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### **Purpose**

A questioning attitude is a function of “a healthy sense of uneasiness.” It challenges assumptions and provides healthy skepticism. It also ensures actions such as planning and decision-making are appropriate for the situation. By using a questioning attitude, it allows openness to be questioned by others, especially when a work task or conditions don’t seem right.

### **When**

Having a questioning attitude does not mean questioning those around you and doubting their knowledge about the work task. It is mental activity where we condition the situation around our work and allows us to think about our work tasks and if they make sense prior to conducting them. A good phrase to think about is “what if, and how.” This allows us to understand what our tasks should look like, and what would be the possible issues if the tasks is not as it was planned or if it has changed.

For instance, an electrician is to replace a breaker in a service panel. When arriving at the site, and opening the panel, the electrician should ask “what if the area I’m working in is still energized, how would I know?” This will help the electrician to stop the task and think about how to proceed.

## STAR

Stop, Think, Act, Review

### Purpose

Routine (skill-based) and non-routine (rule & knowledge-based) work present different challenges to our attention and perception during work execution. Unexpected equipment conditions, unfamiliarity with the task and an inaccurate risk perception are common error traps in performing non routine work.

### When

Before beginning a task, prepare to use STAR:

- While getting ready to perform a “critical step”.
- When you have had to delay work activity due to interruptions or distractions.
- When following a complex or difficult checklist, instruction, or procedure

### How

STOP – Pause and ask: “Am I focused?” Eliminate distractions and interruptions as much as possible.

THINK – Focus your attention and ask: What action am I about to perform?

Do not proceed until you have answered all questions related to doing the task then you should:

Confirm you have selected the correct component.

Resolve any uncertainties before proceeding with the action.

ACT – Focus on the equipment/object and perform the task at hand (Caution: avoid performing multiple actions simultaneously).

REVIEW – Look to verify that the anticipated results were obtained (actual response vs. expected response).

## Stop and Seek Help

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### Purpose

Stop-When-Unsure is a tool that allows a worker to stop an activity or call a “time-out” when a work practice question, safety concern or confusion exists regarding the next step of a task, or when a job process is confusing.

In a knowledge-based situation, the chances for error are high (1:2 to 1:10), as the situation or next step is unfamiliar. It is important as a worker to understand and identify when a situation has become unsure or unfamiliar.

If you as a worker start thinking “what is my next step,” or “what am I doing,” the equipment should be placed in a safe configuration, and you should stop the task and go seek help. This doesn’t need to just be a supervisor or someone of rank, as it could be a co-worker that has done the job before.

### When

As it is hard to physically or mentally stop a work task once started, this tool should be discussed prior to the work, so that it is in the worker’s consciousness. Some situations in which a worker should stop are:

- The results of a task are unexpected or not what was planned
- The situation is not familiar to what was expected
- There are no solutions when thinking of questions regarding the work
- The procedure or work document does not match the tasks that you are performing
- The end-result of the tasks no longer looks as it should prior to the work
- The planned work tasks have deviated to tasks that are unfamiliar

## Three-Way Communication

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### Purpose

The responsibility for effective communication ultimately falls on both the sender of the message and the receiver of the message regarding how the message was understood.

### When

This tool is used when verbal communication is required, either face-to-face or over communication devices. This tool is great when giving directions or work environmental warnings or cautions or limitations in the work environment or giving the status of equipment or procedure in the work environment.

### How

- The sender states the message.
- The receiver paraphrases the message.
- The sender informs the receiver of the message or corrections the receiver and restates the message.

### Avoid

- Stating back to the sender the message verbatim.
- Using slang instead of appropriate terms.
- Communicating when the sender is engaged in another conversation or task.
- Sender not taking responsibility for what is said and heard.

## **Technology Metabolic Schedule**

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References: Stolen Focus (Hari) and Deep Work (Newport), Why Zebras Don't Get Ulcers (Sapolsky)

### **Theory**

Malnutrition does not occur because there is a lack of nutrients or food but also occurs due to food insecurity. If a body does not know when it will be fed again, cortisol and other neurotransmitters conserve fats and sugars rather than convert them to energy. If the body has certainty that it will be fed at 7, 11 and 4, as an example, these neurotransmitters promote a healthy condition. In a similar manner, when we snack on technology all day and night, creating insecurity as to when we will read a text, respond to an email, see how many posts or messages are 'liked', we create a constant distraction and energy drain that can cause us to lose focus, fail to achieve the task at hand or reduce our ability to notice gradual and sudden changes in our work environment.

### **When**

Establishing a Technology Metabolic Schedule (TMS)—having designated times to check and respond to message or search the web to satisfy our interests, relieves the stress and constant distractions that would influence our performance. In one organization of 22,000 employees, 50% of the employees volunteered to establish and commit to a TMS, while the rest of the employees continued 'snacking all day' on their cellphones and computers. After 6 months, all employees were assessed using cognitive response tests and task focused exercises. Those that had committed to the TMS increase their focus four fold and performed 22% better than those who maintained the status quo.

## Two-Minute Drill (Take 2)

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### Purpose

This tool appeals to the need to address the brain's challenge to focus on tasks while needing to actively be aware of our surroundings. After conducting a pre-work meeting (pre-job, pre-task to tailboard), workers will arrive on the worksite. Different days, shifts and environmental conditions can exist that didn't exist before.

### When

To detect conditions unanticipated by work planning or the pre-job brief, this tool should be used:

- Following an extended break or interruptions after work.
- When decisions need to be made to bridge the gap between the ability to be task focused while maintaining situational awareness.
- When working alone or with a new crew.

### How

When arriving at the worksite, each person (support, craft, supervisor) should take two minutes to observe:

- The surroundings at the worksite to determine if anything has changed since the previous work was performed (weather, different crew worked, etc.)
- The facility and if any conditions have changed such as new equipment, changing horizon (new portables, recently torn down building)
- Any new barriers or signage
- If any environmental or worksite conditions are different than what was discussed at the pre-job, tailboard, etc.



## Premortem (Anatomy of an Event)

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### Purpose

Determine potential standards, requirements, and opportunities for error by discussing the possible routes of failure. The primary question to answer is, “we undertook the project or task and it is the end of the day and we did not achieve what was expected and encountered what was unexpected. Exactly where, when and how did these conditions occur?”

Doing a premortem reduces the likelihood of a postmortem.

### When

During the final planning phase, prior to initiating activities where the opportunity for failure increases due to risk and complexity. Requires individuals’ knowledge of the system, processes and practices associated with the planned project or task.

### How

Using the anatomy of an event, participants walk through the visual tool using the following process:

- 1.) Define the ‘event’ condition (failure to meet a deadline, safety related event, violation of regulatory rule or standard)
- 2.) Initiating action: what specific steps or decisions would promote the likelihood of the event
- 3.) Flawed defenses: What policies, procedures, practices, or protocols would increase the likelihood of the event?
- 4.) Error Traps/Precursors: Given this project or task is to be completed under these conditions, using the agreed upon prerequisite process, what error traps would increase the possibility of error likely situations?
- 5.) Latent Organizational Weaknesses: What goals, policies, programs, metrics, and organizational objectives will most influence the likelihood of error traps and flawed defenses?
- 6.) What improvements need to be made to promote the success of the operation?

## Proximity Placement

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### Purpose

"Proximity placement" refers to the practice of placing items or objects in close proximity to each other based on their relevance, functionality, or convenience. It involves arranging things in a way that makes them easily accessible or noticeable to one another. The goal of proximity placement is to improve efficiency, organization, and user experience by grouping related items or elements together. The benefits in a work setting are:

- **Enhanced Organization:** It promotes a sense of order and organization, making it easier for individuals to locate and manage their belongings or information.
- **Reduced Cognitive Load:** When items are logically grouped together, it reduces the mental effort required to remember where things are or how they are organized.
- **Increased Productivity:** In a work or business context, proximity placement can lead to increased productivity because employees can access the tools or resources they need more quickly.
- **Reduced Errors:** In situations where proper placement is critical, such as in manufacturing or healthcare, proximity placement can help reduce errors by ensuring that the right tools or components are readily available when needed.
- **Optimized Space Utilization:** Proximity placement can help maximize the efficient use of physical or digital space by minimizing wasted areas and ensuring that space is allocated based on functionality.
- **Enhanced Decision-Making:** In decision-making processes, presenting relevant information or options in close proximity can assist individuals in making more informed choices.
- **Overall,** proximity placement is a versatile concept that can lead to improved organization, efficiency, and user experience across various domains, from personal organization and workplace productivity to design and user interface development.

### When

Leaders should consistently review how groups, equipment and other materials are grouped to enhance the above bullets. If a new project is being created or new work groups are now working together, this is a critical time to look at this placement.

## Red Team Blue Team

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### Purpose

The "red team-blue team" concept is a cybersecurity and military strategy practice that has also been adapted for other fields, including business, politics, and problem-solving in general. It involves two groups, the "red team" and the "blue team," simulating adversarial roles to assess and improve a system's security, resilience, or decision-making processes. The red team represents the adversarial or attacking side. They are tasked with finding vulnerabilities, weaknesses, and potential threats in a system or organization's defenses. Red teams use various techniques, including hacking, social engineering, and other methods to mimic the tactics and strategies of real-world attackers. The primary goal of the red team is to expose weaknesses, test the effectiveness of security measures, and help the blue team improve their defenses.

The blue team represents the defenders, or the organization being tested. They are responsible for maintaining and defending the system's security. Blue teams work to detect and respond to the simulated attacks and threats presented by the red team. They also use their knowledge and resources to assess the effectiveness of their security measures and improve their defenses based on the red team's findings.

The red team-blue team approach is beneficial for several reasons:

- **Realistic Testing:** It allows organizations to assess their security measures in a realistic and controlled environment, mimicking the tactics and strategies of actual adversaries.
- **Continuous Improvement:** By regularly conducting red team-blue team exercises, organizations can identify vulnerabilities and weaknesses, enabling them to continually improve their security posture.
- **Risk Mitigation:** It helps organizations identify and address potential risks before real threats exploit them, reducing the likelihood of security breaches.
- **Training and Skill Development:** Red team exercises provide valuable training for both the red and blue teams, enhancing their skills and knowledge in cybersecurity and defense.
- **Decision-Making:** In non-cybersecurity contexts, the red team-blue team approach can be used to assess strategies, policies, and decision-making processes, identifying weaknesses and making improvements.

### When

This activity should be done once a work scope has been drafted and the work is ready to move to the execution phase.

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## CLEAR (Post-Job Review)

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### Purpose

The purpose of a post-job review is to document the job that occurred, and if there were any steps, tasks, or conditions that made it less than desirable. It allows work crews to meet and discuss any improvement items, which will reduce the amount of errors. A structured post-job review uses the acronym CLEAR.

### When

CLEAR should be used following non-routine activities that are high hazard and high complexity. This should also be done as soon as practically feasible following the job.

### How

Following the work, the following statements should be used to structure the post-job review:

**C - Change:** Determine whether the task or project has been fully completed according to the defined criteria, and assess whether all necessary steps and components are in place or if there need to be changes to complete the task.

**L - Learn:** Reflect on the experience and identify lessons learned from the job or project. This includes what went well, what could have been improved, and any unexpected challenges or successes.

**E - Errors:** Analyze the outcomes and results against the initial goals and expectations. Evaluate if there were any errors that were not resolved.

**A - Assessment:** Based on the evaluation, determine if the resources were adequate for the job, or if any additional resources are needed for the next time the job is performed.

**R - Results:** Document the findings, evaluations, and adjustments made during the post-job review. Determine if the results were expected or unexpected and adjust as necessary.

The CLEAR post-job review is a valuable tool for continuous improvement, ensuring that each task or project contributes to organizational growth and efficiency by learning from past experiences and making data-driven adjustments for future endeavors.

## Paint the Curb

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### Purpose

Painting sidewalk curbs serves as a visual aid to drivers, pedestrians, and law enforcement to ensure that the rules of the road are followed, and that public safety is maintained. But what does painting a curb have to do with reducing error?

In the United States and other places, people study a booklet and go to class to learn how to drive. The exam is a critical part of attaining a driver's license, however once the license is earned, where does that knowledge go?

The laws and rules still exist but people forget every specific rule due to distractions, aging, etc. Painting the curb helps direct people to correctly perform a step.

### When

The act of painting the curb should be done with the workforce, and prior to starting work. During a walkdown and work meetings, any steps that cannot be performed wrong, or any critical steps should be reviewed to determine if the curb needs to be painted. Examples of "painting the curb" would be:

- Signage that is in a spot where workers can see it and cannot pass it
- Engineering controls that force a worker to stop and think before proceeding
- Placeholder in a procedure, where a signature is required prior to moving on to the next step

## Peer-Check

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### Purpose

Peer checking (PC) is a series of actions by two individuals working together at the same time and place, before and during a specific action. PC augments self-checking by the performer—it does not replace it. The purpose of PC is to prevent an error by the performer. PC focuses on performing the correct act. PC is the least rigorous of the checking and verification tools.

### When

Peer checking should occur immediately prior to, and while performing the task at hand. Both workers should meet prior to working and discuss the process of peer checking, in order to establish clear expectations.

Work activities involving tasks or situations such as the following could benefit from the use of PC.

- Critical steps
- Irreversible or otherwise unwanted actions
- Comparisons of test data with acceptance criteria
- Start or stop of major components
- Return to or removal from service
- Identification of correct parts or correct component before maintenance
- During installation of similar components or parts that could be interchanged or installed incorrectly

### How

Recommended Practices When Using This Tool (Reference: DOE HDBK 1028-2009)

1. The performer self-checks the correct component.
2. The peer self-checks the correct component.
3. The performer and the peer agree on the action to take and on which component.
4. The peer observes the performer, before and during execution, to confirm that the performer takes the correct action on the correct component.
5. The performer executes the intended action on the correct component.

6. If the performer's action is inconsistent with the intended action, the peer stops the performer.
7. If the performer's action is consistent with the intended action, the peer informs the performer that the action taken is correct.

## Scan and Focus (Manager-Monitor Model)

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### Purpose

**Scan:** Scanning refers to the initial, broad observation of your surroundings or work area before you begin a task. The purpose of scanning is to identify potential hazards, assess the work environment, and gather information about the task ahead. It allows you to become aware of any unsafe conditions, equipment malfunctions, or obstacles that might pose a risk during the task.

**Focus:** Focusing follows scanning and involves concentrating your attention on the specific task or objective at hand. Once you've identified potential hazards through scanning, focusing ensures that you carry out the task with precision and care, taking into account safety measures and best practices.

The purpose of scan and focus during work steps is to enhance safety, efficiency, and productivity. It helps workers:

- Identify and mitigate potential risks before starting a task, reducing the likelihood of accidents or injuries.
- Ensure that the task is carried out correctly, minimizing errors and rework.
- Maintain concentration and mindfulness during the task to avoid distractions and accidents.
- Promote a culture of safety in the workplace by emphasizing the importance of hazard recognition and focused execution.

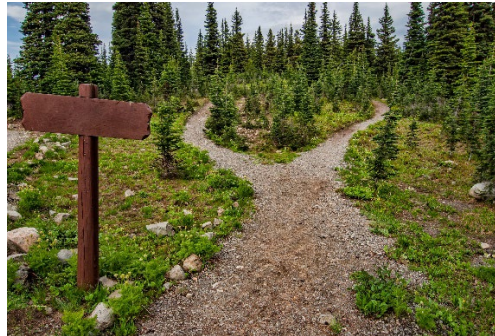
### When

In the Manager-Monitor model, a supervisor or support person directly related to the work should be scanning the environment and workers, and the workers should focus on the task at hand.



## Shaping the Path

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### Purpose

The purpose of "shaping the path" is to design and modify the environment or context in a way that encourages desired behaviors and makes them easier to perform, while also discouraging undesired behaviors by creating obstacles or making them more difficult. It recognizes that people's actions are influenced by their environment, and by shaping the path, you can steer them toward the desired outcomes more effectively.

In short, a leader should shape the path to make work easier to do correctly, and harder to do incorrectly.

### When

From a work management standpoint, shaping the path should be done during the planning of work and projects. Some of examples are:

**Change management:** Shaping the path can help individuals adopt new habits and behaviors more easily by removing barriers and providing cues that prompt the desired actions.

**Compliance:** In healthcare and safety contexts, shaping the path can improve compliance with recommended practices, such as handwashing in hospitals or wearing seatbelts in vehicles.

**Better Decision-Making:** Shaping the path can guide people toward making more informed decisions by presenting relevant information in a clear and accessible manner.

**Safety and Risk Reduction:** In safety-critical industries, shaping the path can reduce the risk of accidents by implementing safety features and protocols that are difficult to bypass or ignore.

**Efficient Resource Utilization:** Shaping the path can optimize resource use by creating systems that encourage responsible consumption and reduce waste.

**Long-Term Change:** By modifying the environment in a sustained manner, shaping the path can lead to long-lasting behavioral changes that persist even when external influences are removed.

Overall, shaping the path is a powerful strategy for achieving desired outcomes, promoting positive behaviors, and creating environments that support individuals and organizations in reaching their goals.