

GUIDE TO OCCUPATIONAL SAFETY RISK MANAGEMENT

Risk Identification, Assessment,
Prioritization & Treatment

CONVERGENCE INCIDENT MANAGEMENT SYSTEM (IMS)

- Incident reporting
- Incident tracking
- Assign, monitor & review corrective measures
- Create OSHA, MSHA & EPA recordkeeping forms
- One-touch OSHA online submission
- Compatible mobile apps

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INTRODUCTION

This guide provides a simple way to use risk-based techniques, including risk identification, assessment, prioritization, and treatment for occupational safety. If you're new to the idea of using risk-based approaches for occupational safety, this guide provides a good starting point and points you in the right direction. That said, there's a lot to learn about risk management and the use of risk management for occupational safety, and we encourage you to continue studying the topic, expanding your knowledge, and increasing the sophistication of your risk-based occupational safety approach.

While Convergence Training/RedVector has made this guide to help you and your organization with your safety efforts, please know we can't (and don't) guarantee that following this guide will eliminate all risks at your workplace and/or prevent incidents from occurring at your workplace, and we assume no liability for safety incidents at your work.

We've put together this guide to teach you basics of risk-based techniques for safety management but also to provide you with templates you can print off and use at your own workplace. For the templates, see the risk identification template on page 6, the risk assessment matrix template on page 8, the risk prioritization template on page 14, the controls selection template on page 19, and the risk treatment and tracking matrix on page 22.

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A grayscale photograph of a construction site. In the foreground, two construction workers wearing hard hats and safety harnesses are sitting on a network of steel beams. One worker on the left is holding a long vertical rod. In the background, a large crane is lifting a long steel beam into place. A multi-story building with many windows is visible in the far background.

PART I

RISK IDENTIFICATION

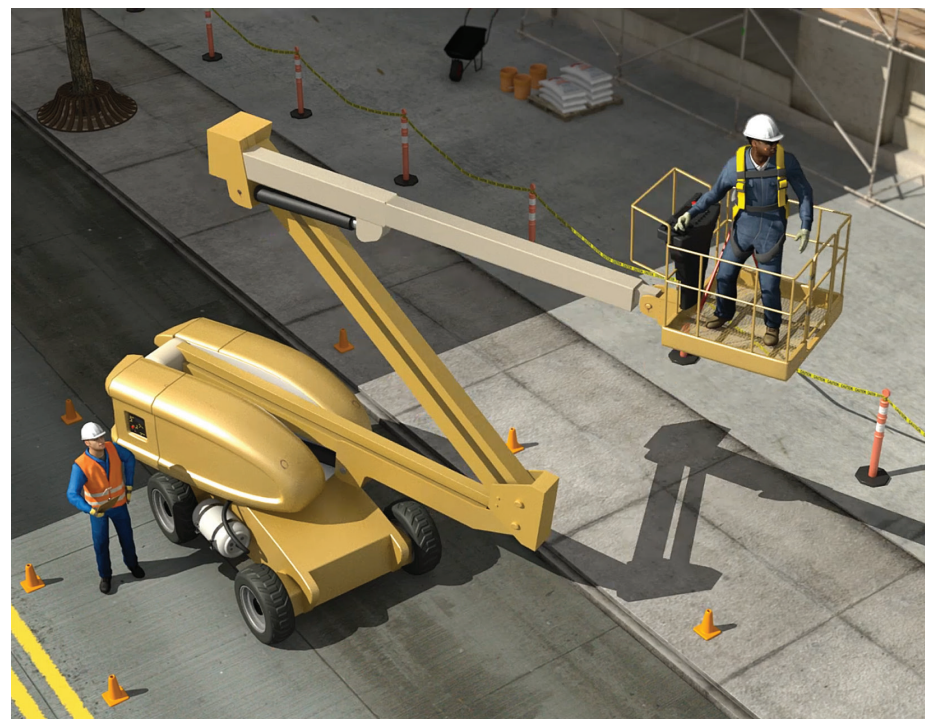
RISK IDENTIFICATION

The first step of risk management for occupational safety and health is to identify the risks at your workplace. You can do this by creating a team to perform an audit of your workplace to identify risks. Use the Risk Identification template we've provided on the following page to do this.

The point of risk identification is to identify risks that could lead to safety, health, or other risk at your work area. Once you've identified the risks and written some notes on them, you can then move on to assess the risks and prioritize the risks for mitigation/control.

It's best to examine the workplace and identify risks using a multi-person team. It's a good idea to include safety professionals, subject matter experts and/or engineers, and workers on the team, since all will have unique and valuable insights, knowledge, and experience to share.

Please note: If you identify a serious risk that's likely to cause harm soon at the workplace, address that risk first before continuing with this process.



RISK IDENTIFICATION TABLE			
Plant/Facility:			Date:
RISK	WORK AREA/LOCATION	HOW COULD RISK LEAD TO HARM/INCIDENT?	ADDITIONAL NOTES

A grayscale photograph of a construction site. In the foreground, two construction workers wearing hard hats and safety harnesses are sitting on a steel beam. One worker on the left is holding a long vertical rod. In the background, a large crane is lifting a long steel beam into place. The background also shows a multi-story building under construction.

PART II

RISK ASSESSMENT

RISK ASSESSMENT

Once you've identified risk at your workplace, you'll want to assess each risk before you prioritize the risks for mitigation/control/corrective actions. You can use a risk assessment matrix like the one shown below.

RISK ASSESSMENT MATRIX				
Risk:		Location:		Date:
	MINOR	SERIOUS	MAJOR	CATASTROPHIC/CRITICAL
VERY LIKELY				
PROBABLE				
POSSIBLE				
UNLIKELY				
RARE				

The basic idea is for each risk, you use a matrix to estimate the potential severity and likelihood of the outcome. You mark the cell in the matrix that corresponds to the severity and likelihood of the risk you're analyzing.

This is demonstrated on the following page.

This assessment will help you determine how to prioritize all the risks at your workplace for controls. You will want to address the risks that could lead to the most severe outcomes, that are most likely to occur, and/or both before you address risks that lead to less severe outcomes and/or risks that are less likely to occur.

Here's an example risk matrix for a risk that would rarely lead to an incident and that would result in a minor incident.

RISK AND LOCATION				
Risk:		Location:		Date:
	MINOR	SERIOUS	MAJOR	CATASTROPHIC/CRITICAL
VERY LIKELY				
PROBABLE				
POSSIBLE				
UNLIKELY				
RARE	X			

And here's an example risk matrix for a risk that is likely to occur and would result in a catastrophic incident.

RISK AND LOCATION				
Risk:		Location:		Date:
	MINOR	SERIOUS	MAJOR	CATASTROPHIC/CRITICAL
VERY LIKELY				X
PROBABLE				
POSSIBLE				
UNLIKELY				
RARE				

As you probably guessed from the examples above, you'd put a high priority on controlling the risk that's very likely to lead to a catastrophic incident and you'd put a low priority on controlling the risk that's unlikely to lead to an incident that would be very minor if it did occur. In fact, our examples are so extreme you'd probably stop everything you're doing and address the likely/severe risk immediately and you might decide to never do anything about the unlikely/minor risk.

One thing you'll want to do in advance is determine your organization's risk tolerance. You can then separate the

different cells in the matrix into a number of different "zones" to help you more easily prioritize the risks for control/mitigation.

This is demonstrated for you in the sample matrix below.

You might also want to consider using a numerical scoring system within your matrix (negligible = 1, minor = 2, moderate = 3, significant = 4, severe = 5 and very unlikely = 1, unlikely = 2, possible = 3, likely = 4, and very likely = 5) that would lead to a numerical score for each risk (if likelihood = 3 and severity = 3, then $3 \times 3 =$ risk score of 9).

	NEGLECTIBLE	MINOR	MODERATE	SIGNIFICANT	SEVERE
VERY LIKELY	Low Med	Medium	Med Hi	High	High
LIKELY	Low	Low Med	Medium	Med Hi	High
POSSIBLE	Low	Low Med	Medium	Med Hi	Med Hi
UNLIKELY	Low	Low Med	Low Med	Medium	Med Hi
VERY UNLIKELY	Low	Low	Low Med	Medium	Medium

We've provided the following page with blank template risk matrixes you can print out and use during your risk assessment process.

RISK ASSESSMENT MATRIX				
Risk:		Location:		Date:
	MINOR	SERIOUS	MAJOR	CATASTROPHIC/CRITICAL
VERY LIKELY				
PROBABLE				
POSSIBLE				
UNLIKELY				
RARE				

RISK ASSESSMENT MATRIX				
Risk:		Location:		Date:
	MINOR	SERIOUS	MAJOR	CATASTROPHIC/CRITICAL
VERY LIKELY				
PROBABLE				
POSSIBLE				
UNLIKELY				
RARE				



PART III

RISK PRIORITIZATION

RISK PRIORITIZATION

Now that you've identified the occupational safety and health risks at your workplace and have used a risk matrix to assess the risks, you'll want to prioritize the risks for mitigation. We've provided a template for you to do this on the following page. Put the highest-priority risks on top of the list and the lowest-priority risks on the bottom.



RISK PRIORITIZATION (put highest-priority risk at top)			
RISK	LOCATION	ADDITIONAL NOTES	MARK WHEN MITIGATED (LATER)

The background image is a grayscale photograph of a construction site. It shows a network of steel beams forming a structural frame. Two workers, wearing hard hats and safety harnesses, are visible. One worker on the left is sitting on a beam and holding a long vertical rod. Another worker on the right is also sitting on a beam, looking towards the center. In the upper part of the image, a large horizontal steel beam is being lowered into place by a crane, with cables and a hook visible. The background shows a multi-story building under construction with many windows.

PART IV

HIERARCHY OF CONTROLS AND CONTROLS SELECTION

HIERARCHY OF CONTROLS AND CONTROLS SELECTION

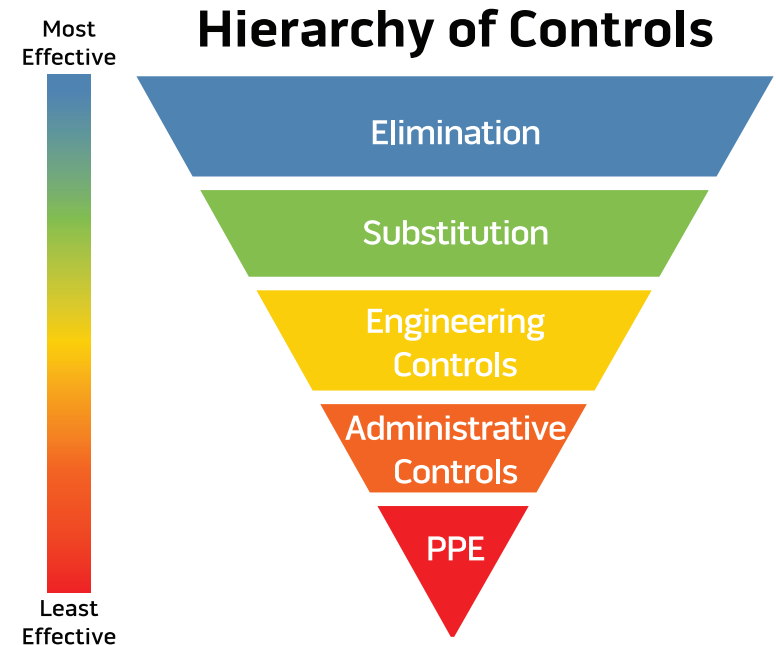
To mitigate the risks, you'll want to select appropriate controls. To do so, use the hierarchy of controls. The idea of the hierarchy of controls is that you should consider implementing controls at the top of the hierarchy (like elimination) first and consider controls at the bottom of the hierarchy (like PPE) last—it's important to remember that PPE should be used as a last resort and not a first alternative. In many cases, you'll find you need a combination of controls from different levels of the hierarchy.

Elimination or Substitution

If you can remove the hazard entirely, or put some form of substitute in place, do that. That's the best way to deal with a hazard—make it go away. An example would be removing a sharp edge on the corner of a machine so nobody could get cut.

Other examples include:

- Designing or redesigning a facility, equipment, or process to eliminate or minimize the hazard
- Substituting processes, equipment, materials, or other factors to eliminate or minimize the hazard
- Other solutions



Engineering Controls

Engineering controls involve re-designing the work area so that the hazard is eliminated or reduced. An example would be enclosing a noisy motor inside a sound-proof box.

Engineering controls may include:

- Enclosing the hazard
- Isolating the hazard with interlocks, machine guards, blast shields, welding curtains, or other means
- Removing or redirecting the hazard, such as with exhaust ventilation
- Other solutions

Administrative Controls

Administrative controls involve modifying the way people work around a hazard to reduce the risk. An example might be limiting the number of hours someone works lifting heavy boxes from the end of a conveyor belt.

Other administrative controls may include:

- Exposure time limits (often used for temperature extremes and ergonomic hazards)
- Monitoring the use of hazardous materials
- Alarms, signs, and warnings
- Buddy systems
- Safety training
- Other solutions

Personal Protective Equipment (PPE)

PPE can be used to protect people who are working in the presence of hazards. An example would be giving a respirator to someone working near airborne crystalline silica. PPE should only be used as a last resort, once the other forms of controls listed above have been tried. PPE may be used in combination with the other forms of controls, too.

Consider using PPE in these instances:

- When engineering controls aren't feasible
- When engineering controls don't totally remove the hazard
- While engineering controls are being developed
- When safe work practices don't provide sufficient additional protection
- During emergencies when engineering controls may not be feasible

Use the table on the next page to consider different controls from the hierarchy of controls for each risk. Remember the following:

- Try to use higher-level controls (such as elimination and substitution) before trying to use lower-level controls (such as PPE)
- Use PPE as a last resort
- You may have to use multiple controls, including controls from different levels of the hierarchy



RISK:		
CONTROL LEVEL	SPECIFIC CONTROL(S)	ADDITIONAL NOTES
ELIMINATION (PREFERRED)		
SUBSTITUTION		
ENGINEERING CONTROL		
ADMINISTRATIVE CONTROL		
PPE		
ADDITIONAL NOTES		

A grayscale photograph of a construction site. In the foreground, two construction workers wearing hard hats and safety harnesses are sitting on a network of steel beams. One worker on the left is holding a long vertical rod. In the background, a large crane is lifting a long steel beam into place. A multi-story building is visible in the distance. The image has a blue overlay on the left side containing the text 'PART V'.

PART V

RISK TREATMENT & RISK TREATMENT TRACKING

RISK TREATMENT & TRACKING

Now it's time for the last step—to implement the risk controls you've selected and make sure they're implemented.

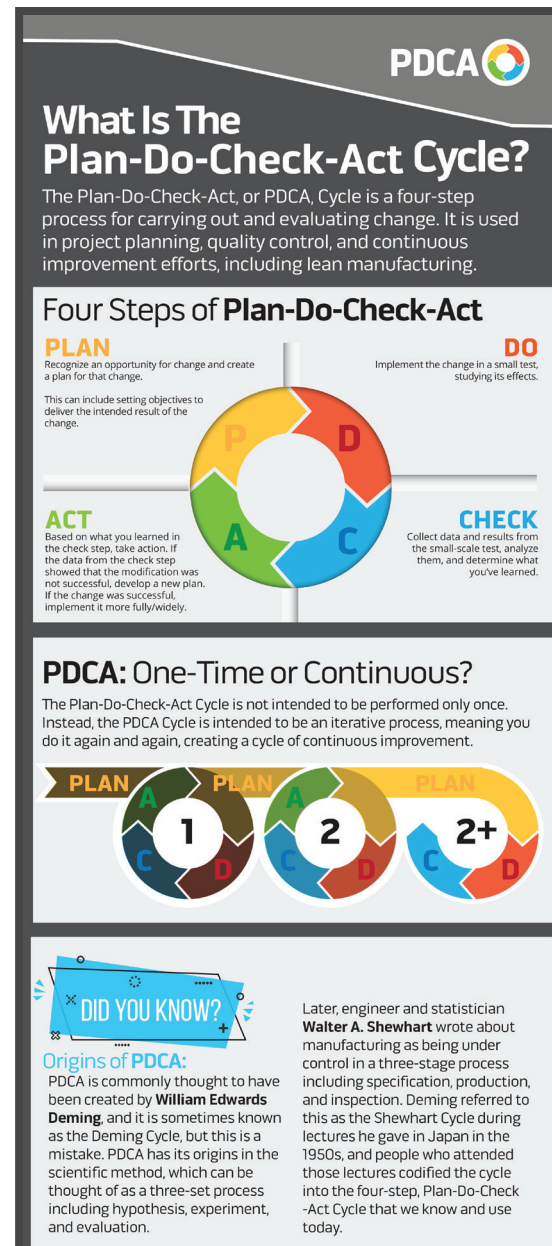
You'll want to select one or more persons to implement each risk treatment on your list, notify them of their responsibilities, have them implement the risk treatment, and then confirm the work is done. At that point, you or someone else can evaluate the risk treatment to evaluate if it was completed properly and it sufficiently lowers the risk to an acceptable level.

We've included a template you can use for this purpose on the next page.



RISK TREATMENT TRACKING				
Risk	Treatment	Assigned to	Completed	Confirmed
Additional Notes:				
Risk	Treatment	Assigned to	Completed	Confirmed
Additional Notes:				
Risk	Treatment	Assigned to	Completed	Confirmed
Additional Notes:				
Risk	Treatment	Assigned to	Completed	Confirmed
Additional Notes:				

Your job doesn't end when you've confirmed that a risk treatment has been put into place. You'll want to cycle back periodically to continually evaluate the risk treatment, ensuring its adequacy and thinking of ways of continually improve in order to lower risks at your workplace.



PART V

CONCLUSION



We hope you found this introduction to some of the basic techniques of applying a risk-based safety approach helpful. Remember that this guide is intended as an introduction and there's still much to learn about risk-based safety approaches. In particular, we encourage you to get a copy of the [ISO 31000/ANSI/ASSP Z690 Risk Management Standards](#).



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- Learning management system (LMS) for safety training administration
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- Mobile apps for training & incident tracking

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