

ADD-1 for Safety

A Proactive Approach to Construction Safety

What is ADD-1 for Safety?

ADD-1 for Safety is an additive safety practice that helps project personnel think about, plan, and implement safe work operations on construction projects. It focuses on three important abilities/needs to ensure safe work – **Anticipate**, **Detect**, and **De-stress** – by adding at least **one** extra element to a work plan. *ADD-1 for Safety* provides a proactive, strategic approach to safety that addresses human behavior-related root causes of accidents and improves the quality of safety programs.

Why ADD-1 for Safety?

Safety starts with the desire to protect human life and prevent injuries and fatalities. This motivation is our top priority, and the primary purpose for implementing *ADD-1 for Safety*. Cost, schedule, and quality are also project concerns, and all are tied to safety:

- When an accident does occur, research shows that the associated costs are high. It has been estimated that for all US work industries combined in 2018, the average cost of a medically consulted injury was \$41,000, and \$1,190,000 per fatality.¹ These values represent income not received or expenses incurred because of the injury or fatality.
- Accidents also result in lost time. The total time lost due to work-related injuries in the US in 2018 has been estimated to be 70,000,000 work days.¹ This value is not comprehensive; it does not include time lost by people with nondisabling injuries or other people directly or indirectly involved in the accidents. The costs associated with this additional lost time add to the costs reported above.
- It is commonly known, and research shows, that “safety pays.” That is, investing in safety to prevent injuries and fatalities leads to a positive return on investment. For example, one research study revealed that the total benefits of accident prevention outweigh the costs of accident prevention by a ratio of approximately 3:1.² This finding means that for every \$1 invested in safety, approximately \$3 is gained in benefit.

ADD-1 for Safety promotes taking a proactive approach to safety where additional investment is made before and during the work, and thus, before accidents occur. Rather than incurring the high costs and lost time related to accidents, investments of additional time and effort are

¹ “Work Injury Costs,” *Injury Facts*, National Safety Council (NSC), <https://injuryfacts.nsc.org/work/costs/work-injury-costs/>, accessed Dec. 15, 2020.

² Ikpe, E., Hammon, F., and Oloke, D. (2012). “Cost-Benefit Analysis for Accident Prevention in Construction Projects.” *Journal of Construction Engineering and Management*, ASCE, 138(8), 991-998.

made up front. As a result, and most importantly, there will be fewer injuries and fatalities. Moreover, a positive return on investment accrues from reduced costs, increased profits, and saved time on projects. While there is initial cost in terms of time and effort, the benefits ultimately outweigh the costs.

How does *ADD-1 for Safety* work?

“Measure twice, cut once.” “An ounce of prevention is worth a pound of cure.” These expressions remind us that it is easier and more beneficial to invest time and effort up front to prevent something from occurring in the first place than to repair the damage after it has happened. *ADD-1 for Safety* follows this advice. It also addresses issues we face with human nature that contribute to many accidents, such as making mistakes/errors, being absent-minded and forgetful, lacking the right information and knowledge, making poor decisions in stressful situations, mixing up priorities, and poor risk management.

How does it work? When planning and conducting work, simply add something extra – one extra review, an additional check, a helping hand, an extra set of eyes, one more hour, another person, or some other additive feature or resource – to your plan and work operation.

- Look for ways to add something to help:
 1. **A**nticipate potential problems and needs to make work easy and safe;
 2. **D**etect and prevent hazards; and
 3. **D**e-stress the work environment.
- Identify additions that will improve reliability in the work operation by increasing redundancy, minimizing uncertainty, eliminating distractions, and preventing last-minute changes.
- Fill gaps in the work process that put workers at risk of injury and lead to improvisation.
- Add resources to eliminate fatigue, schedule/productivity pressure, and crowding.

Actively think about ways to add to safety on the project. And then, importantly, implement those extra features identified. Additions may be implemented during planning and design, when conducting job hazard analyses, as part of the construction work, or at any other time in the project.

Examples of recommended *ADD-1 for Safety* additions are provided in the table below. Also provided is a simple example of a job hazard analysis (JHA) template that prompts the person performing the analysis to “ADD-1 for Safety.”

ADD-1 for Safety Recommendations	Purpose/Benefit
<p>During design:</p> <ol style="list-style-type: none"> 1. Add an additional design review that focuses solely on jobsite safety and constructability 2. Add an additional check of design calculations 	<ul style="list-style-type: none"> • Create designs that reduce the exposure of workers to hazards and increase the opportunity to construct the designs safely • Prevent design errors that could lead to accidents during construction
<p>Designer-constructor communication:</p> <ol style="list-style-type: none"> 1. Add an additional note on the drawings that describes unique hazards associated with the design 2. Send an additional e-mail or make an additional call to the constructor to communicate unique aspects of the design that may create safety hazards during construction 	<ul style="list-style-type: none"> • Make sure that the constructor is aware of potential conditions and design failure modes that could lead to safety hazards during construction • Maintain a proactive and collaborative relationship between the designer and constructor to work together to improve safety
<p>Construction pre-task planning:</p> <ol style="list-style-type: none"> 1. Ask one more person to review the job hazard analysis (JHA) 2. Include one more worker in the crew during critical, complex, and highly hazardous operations 3. Allow the crew one more hour to perform a task 4. Specify one more safety control to mitigate the hazard 5. Identify one more way to perform the work in case an unanticipated change arises 6. Include one extra piece of equipment or material 	<ul style="list-style-type: none"> • Prevent the possibility of mistakes and omissions when planning the work • Provide an extra worker to anticipate problems and detect hazards • Provide a helping hand to mitigate unanticipated changes that can lead to improvisation and stress • Create a redundant safety system in case of a failure • Allow for worker rest when performing strenuous and highly repetitive tasks over long periods of time • Eliminate pressures and improvisation when there is a lack of supplies or broken/missing equipment
<p>Conducting the work:</p> <ol style="list-style-type: none"> 1. Check safety guards and your PPE one more time before starting to work 2. Ask for another helping hand when lifting heavy or awkwardly-shape objects 3. Take one more look at equipment and MEP systems to see if they are energized 4. Take an additional minute to check your surroundings for safety hazards and for other workers who may be in danger 	<ul style="list-style-type: none"> • Reduce the possibility of overlooking a safety issue with equipment and PPE use • Prevent strains, sprains, and other musculoskeletal disorders • Reduce chance of contact with energized and pressurized systems • Maintain a buffer from hazardous conditions, and stay out of the line of fire

JOB HAZARD ANALYSIS

Project title: _____ Date: _____ Page: _____ of _____

Area of Work: _____ Start Date/Time: _____

Task(s) to be Completed: _____ End Date/Time: _____

Crew Members: _____

Work Evaluation: Indicate whether any of the following are present or needed. Select all that apply.

Yes	No		Yes	No		Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Special training	<input type="checkbox"/>	<input type="checkbox"/>	Eye/face protection	<input type="checkbox"/>	<input type="checkbox"/>	Confined space
<input type="checkbox"/>	<input type="checkbox"/>	Special permits and/or procedures	<input type="checkbox"/>	<input type="checkbox"/>	Hearing protection	<input type="checkbox"/>	<input type="checkbox"/>	Excavation
<input type="checkbox"/>	<input type="checkbox"/>	Special material and/or tools	<input type="checkbox"/>	<input type="checkbox"/>	Hand/arm protection	<input type="checkbox"/>	<input type="checkbox"/>	Overhead hazards
<input type="checkbox"/>	<input type="checkbox"/>	Special signage	<input type="checkbox"/>	<input type="checkbox"/>	Fall protection	<input type="checkbox"/>	<input type="checkbox"/>	Protection of the public
<input type="checkbox"/>	<input type="checkbox"/>	Work under/near electrical lines	<input type="checkbox"/>	<input type="checkbox"/>	Manlift or ladder	<input type="checkbox"/>	<input type="checkbox"/>	Lock out / tag out
<input type="checkbox"/>	<input type="checkbox"/>	Work in, over, or near water	<input type="checkbox"/>	<input type="checkbox"/>	Barricade	<input type="checkbox"/>	<input type="checkbox"/>	Weather impacts
<input type="checkbox"/>	<input type="checkbox"/>	Work adjacent heavy equipment	<input type="checkbox"/>	<input type="checkbox"/>	Respirator	<input type="checkbox"/>	<input type="checkbox"/>	Infrequent activity
<input type="checkbox"/>	<input type="checkbox"/>	Work next to open flame	<input type="checkbox"/>	<input type="checkbox"/>	Spotter	<input type="checkbox"/>	<input type="checkbox"/>	Working alone
<input type="checkbox"/>	<input type="checkbox"/>	Work with toxic substances	<input type="checkbox"/>	<input type="checkbox"/>	Forklift	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____
<input type="checkbox"/>	<input type="checkbox"/>	Work at elevation	<input type="checkbox"/>	<input type="checkbox"/>	Fire extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____

Equipment Required: _____

Tools Required: _____

Training Required: _____

JOB HAZARD ANALYSIS (continued)

Work Tasks	Safety Hazards Present	Safety Precautions	ADD-1 for Safety

Foreman: Name: _____

Signature: _____

Crew Members: Name: _____

Signature: _____

Name: _____

Signature: _____

Name: _____

Signature: _____

Name: _____

Signature: _____

Name: _____

Signature: _____