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THE CONSTRUCTION USERS ROUNDTABLE

"THE OWNERS VOICE TO THE CONSTRUCTION INDUSTRY"

Construction Owners' Safety Blueprint

R-807
September 2004

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Notice:

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The Mission of The Construction Users Roundtable (CURT) is to promote cost effectiveness for owners doing business in the United States by providing aggressive leadership on issues that will significantly improve project engineering, maintenance and construction processes, thereby creating value for the owners.

> *In an industry fraught with danger, construction owners can protect workers and themselves—if they are willing to lead the way and confront the risks head-on.*

1. Introduction

Construction always seems to make the "Ten Most Dangerous Jobs" list compiled annually by the U.S. Department of Labor, Bureau of Labor Statistics. An occupation "earns" this distinction based on its rate of fatalities per 100,000 workers.

According to the U.S. Department of Labor's Bureau of Labor Statistics, 417,700 private-sector construction workers were accidentally injured in 2002. On a national scale, economic losses resulting from construction accidents reach into the billions of dollars. Of greater

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consequence, and impossible to quantify, is the personal toll—the human suffering that accompanies any construction accident. The primary victims of construction fatalities and injuries are the injured workers and their families. However, other stakeholders share the consequences—architects, engineers, designers, and owners.

All stakeholders, including workers, bear responsibility for creating and maintaining safe construction workplaces. But CURT believes construction owners hold the greatest potential leverage—the authority to influence the behavior of others. For this reason, owners are the best candidates to lead the construction industry toward consistent achievement of safe projects—and maybe, some day, to a long-awaited exit from the Most Dangerous Jobs list.

CURT's Philosophy: It's Up to the Owners

In an industry fraught with danger, construction owners can protect workers and themselves—if they are willing to lead the way and confront the risks head-on. Owners who cannot (or will not) take the reins on safety are courting disaster in both a human and a business sense. Dynamic leadership by individual owners can help reduce injuries, disabilities, and deaths caused by construction accidents. By reducing the number of safety incidents, the owner will also benefit by reducing lost-time productivity and reducing the chances of escalating project costs, which in turn helps maintain the value of the owner's investment.

Guiding Principles for Safety

1. No construction-related injury, illness, or damage to property or the environment is acceptable.

2. Owners should work to prevent all such injury, illness, or damage.

3. An organization will achieve whatever performance level it is willing to accept.

4. "Zero incidents" is the only justifiable goal.

The Guiding Principles

CURT has developed four Guiding Principles for Safety that can serve as a starting point for owners ready to take charge of their safety effort. The Principles are:

1. No construction-related injury, illness, or damage to property or the environment is acceptable.

2. Owners should work to prevent all such injury, illness, or damage.

3. An organization will achieve whatever performance level it is willing to accept.

4. "Zero incidents" is the only justifiable goal.

From these principles, owners can begin to establish supporting goals, standards, programs, and behaviors. The principles do not replace the legal or regulatory obligations of each stakeholder. Instead, they foster an environment that supports safe work practices. In this environment, all parties are encouraged to go beyond their legal obligations and take reasonable measures to prevent any injuries or illnesses.

About This Document

CURT has created this *Construction Owners' Safety Blueprint* as a strategic **guideline** for safety performance that any organization can follow—provided it will commit itself to direct owner involvement and the time and resources that requires. The safety blueprint calls on owners to:

1. Set the expectations each stakeholder will be expected to deliver.

2. Establish a safety culture that reinforces the Guiding Principles from project inception to closeout.

3. Monitor safety performance and demand achievement of all safety-related objectives in the project life cycle.

The appendix, "Construction Health and Safety Management System—Tactical Elements," guides users through the proven, tactical elements and user practices that should be considered when developing a comprehensive construction safety program.

Note: While CURT advocates owner involvement as a means to achieve workplace safety, it also recognizes the risks associated with such involvement. Interaction with contractor personnel can have a profound impact on safety performance, but owners must take care to influence contractor behavior **without interfering with the contractor's legal responsibilities as an employer**. Contractors are ultimately responsible for the safety of their employees. This document is not intended to suggest otherwise.

2. Setting Expectations

Owners must position safety as a project deliverable equal to other deliverables such as cost and schedule. To that end, owners have the right to expect the following of **all** stakeholders:

1. Safety will be a core value of all parties involved in a project.

2. Safety will be integrated into all parties' work processes.

3. Operational discipline will be practiced at all levels.

4. Stakeholders will understand their client's expectations and will routinely meet or exceed them.

5. All stakeholders will manage safety as a business deliverable.

> *Leaders who personify and communicate an organization's core values are showing others what the company stands for. Core values give employees and stakeholders a foundation for decision-making that supports the company's way of doing business.*

Expectation #1: Safety Is a Core Value

Owners who include safety among their core values are making a long-term commitment. Unlike products, services, or other aspects of a business, values should not change with time or circumstances. Also, core values are meaningful only when they are exemplified by leaders. Leaders who personify and communicate an organization's core values are showing others what the company stands for. Core values give employees and stakeholders a foundation for decision-making that supports the company's way of doing business.

Organizations that understand and reflexively practice their core values can then insist on contractors and subcontractors who share those values.

Organizations that have adopted safety as a core value have specified how that value translates to the project level:

▲ Any illness, injury, or near miss is unacceptable. (This echoes Guiding Principles 1 and 2.)

▲ To prevent injuries, owners should go beyond a regulatory compliance approach to planning.

▲ Employees at all levels have specific safety responsibilities that are integrated into work processes.

For core values to move from the abstract to the concrete, they must become part of the organization's work processes.

Expectation #2: Safety Is Integrated into Work Processes

To realize a safety-conscious workplace, owners must evaluate all work processes from a safety standpoint. In every aspect, the workplace must prove that safety is not just another item on a list of things to accomplish—it is the very manner in which things get done.

Three Decisions That Can Have an Impact on Workplace Safety

▲ **Scheduling overtime:** Fatigued workers are more vulnerable to accidents.

▲ **Using lower-cost materials or tools:** Make sure cheaper alternatives are not more hazardous to work with.

▲ **Working with "live" systems:** Can work be coordinated to take place on deenergized systems? Opt for this safer approach whenever possible.

When safety is part of an organization's culture, team members in all roles are expected to ensure their own safety, to ensure the safety of those around them (to the extent possible), and to deliver safe work products. All team members have safety-related responsibilities and accountabilities.

For those in leadership roles, integrating safety means evaluating all cost-, schedule-, and quality-related decisions to determine their impact on safety. Three decisions that can have an impact on workplace safety are:

- ▲ **Scheduling overtime:** Fatigued workers are more vulnerable to accidents.

- ▲ **Using lower-cost materials or tools:** Make sure cheaper alternatives are not more hazardous to work with.

- ▲ **Working with "live" systems:** Can work be coordinated to take place on deenergized systems? Opt for this safer approach whenever possible.

Expectation #3: Operational Discipline Is Practiced at All Levels

Operational discipline is the routine practice of desired on-the-job behavior. It exists in a workplace where "the right things are done the right way, every time."

Organizations that have operational discipline also exhibit the following characteristics:

- ▲ Clear standards of behavior

- ▲ Employee and contractor behavior that consistently reflects the organization's standard operating procedures

- ▲ A system for rigorously managing any variation to the standard

When operational discipline is in place, employees and contractors who adopt the desired behaviors feel valued and rewarded.

Expectation #4: Owner Expectations Will Be Understood and Met

This expectation carries responsibilities on both sides. Once the owner has established standards that can reasonably be understood and achieved, contractors should be expected to:

- ▲ Know what is in their contract

- ▲ Initiate communication with the owner to gain clarification on safety expectations

- ▲ Manage subcontractors to the same standards

- ▲ Take initiative where appropriate to ensure that safety expectations are met

- ▲ Meet expectations at all times—not just when the owner is watching

Expectation #5: Safety Is a Business Deliverable

To make this expectation a reality, the following must be true in both the owner and contractor organizations:

- ▲ Safety is a measurement of both individual and organizational performance for all parties.

- ▲ Safety metrics carry equal weight among all stakeholders and at all levels.

It is not enough to set expectations for safety. Owners should establish the requirements and assist in providing resources needed to meet them.

Implications of Ignoring Safety Expectations

It is in the contractor's best interest to make an owner's safety expectations its own. For some time, legal and economic forces have been motivating owners to rethink their contracting relationships.

The bottom line is: contractors who minimize costs associated with injuries will be more competitive against their peers and more attractive to enlightened owners. Contractors who do not minimize the costs associated with injuries will be at a competitive disadvantage.

3. Establishing a Safety Culture

When safety awareness is integrated into all aspects of a company, including its leadership and corporate decisions, that organization can be said to have a safety culture. Such an environment continuously sends and reinforces the message that safety is every project's most important outcome. The safety culture is reflected in every project activity:

- ▲ Crafting the contract
- ▲ Staffing the project
- ▲ Bidding the work
- ▲ Preparing for construction
- ▲ Overseeing construction

Crafting the Contract

To the greatest extent possible, a contract for construction should support the Guiding Principles for Safety and the owner expectations discussed previously. Contract language serves to establish the performance, behavior, and deliverables that will be required of the contractors. It also should signal that the owner will value and reward safe work practices.

The contract language must define the relationships between owner and contractor and must clearly establish the owner in the role of leader. This means specifying what actions the owner can take to contribute without interfering with the contractors' work. The contract must also address the resources, procedures, and goals the owner will use to fulfill the leadership role.

Contract Language: "How" vs. "What"

When preparing a construction contract, an owner must decide what type of language best reflects its priorities for contractor performance. If the owner is most concerned with the contractor's means and methods for completing a requirement (the "how"), then the contract must explicitly list those means and methods in enough detail to allow the contractor to comply. However, if the result (the "what") takes precedence, the owner's focus should be on crafting contract language to make that result understandable and achievable.

Note: Some state laws prohibit certain owners from dictating contractors' means and methods. For the most part, these owners can define contractor requirements only in terms of results.

"How" Language (Means and Methods-Based)

Owners choosing to specify how work will be done must recognize that they may become accountable for the outcome. The contractor firm will likely be held responsible only for the degree to which it performed the specific contract requirements.

"What" Language (Results-Based)

Owners choosing to focus contractor requirements on results must define the outcome they seek. The language chosen must be easily understood and must show that the outcome can be accomplished. Once an owner opts for the "what" approach, the "how" will have to be left primarily to the contractor's discretion.

Possible Mix of Contract Language Types for Safety Requirements	
How	**What**
▲ Reporting labor hours and safety performance metrics ▲ Reporting job site incidents ▲ Performing "hot" work according to certain guidelines	▲ Completing job with no injuries ▲ Ensuring a drug-free workforce ▲ Staffing a job to deliver safety results

Balancing the Two Types

Many owners find that for establishing both standard and discretionary safety requirements, a successful contract contains a mix of both language types.

Standard or basic requirements establish baseline expectations and remind contractors of their legal obligations. Such requirements include clauses stating that the contractors are in control of the work and have responsibility for the safety of the employees; that they must adhere to all federal, state, and local requirements; and that they must hold all their subcontractors to the requirements of the general contract.

Beyond these basic clauses, owners can decide how much information and guidance should be included to describe their goals for the project. Safety requirements for special situations—for example, working around existing processes, coordinating work with owner operations, or performing hot work, critical lifts, etc.—may need to be included. The best location for these types of requirements (in the contract itself, the general conditions, or the specifications) depends on the importance of the requirement and on which contract document takes precedence over others in the event of a conflict.

Other requirements an owner might consider putting in the contract include partnering, subcontractor selection/management, incident investigation, visitor protocol, emergency response, and public protection.

As the contract takes shape, the project's staffing requirements become clearer, and the owner can begin to form the project team.

Of course, contract terms differ greatly. Owners and contractors have various ways of conveying expectations based on state laws, country laws, customs, project size, and the relationship between the parties.

Staffing the Project

A capable team can play a significant role in maintaining a safety culture. The project team's role in the safety culture includes the following:

▲ Work with bidders and contribute to the award decision
▲ Steer the project once construction begins
▲ Define and practice safety requirements
▲ Deliver a consistent message throughout the project

The Project Team's Role in the Safety Culture

▲ Work with bidders and contribute to the award decision
▲ Steer the project once construction begins
▲ Define and practice safety requirements
▲ Deliver a consistent message throughout the project
▲ Ensure consistent adherence to safety requirements by a large, diverse, and ever-changing cast of characters

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▲ Ensure consistent adherence to safety requirements by a large, diverse, and ever-changing cast of characters

Continuity affects quality, so if the owner's resources and organizational structure permit it, the team should include at least some employees who can be dedicated from bidding through construction and beyond. In some cases, the owner may need to contract for project administration or other skills. Either way, the project team should be in place and cognizant of project requirements well before bidding.

While staffing a project, the owner should decide some basic issues about how the team will function:

- ▲ How will roles and responsibilities be defined?

- ▲ Which team members will have the authority to act or make decisions?

- ▲ How many team members should be dedicated?

- ▲ What are the team's administrative support requirements, and how will these be met?

- ▲ What logistical issues need to be addressed before construction begins?

The contractual safety requirements will likely be communicated to prospective contractors as part of the bid package. With staffing in place, the owner's team can turn its attention to the bidding phase.

Bidding the Work

The owner's safety focus should be reflected at the following points in the bidding process:

- ▲ Preparing bid instructions and documents

- ▲ Conducting the pre-bid meeting

- ▲ Evaluating the bids

Owners who can legally do so may choose to prequalify contractors on their past safety performance. Prequalification data should be updated as necessary.

Preparing Bid Instructions and Documents

Bid instructions describe how the bid process will work and what the owner expects to see in a bidder's response. They can also alert bidders to key information in the larger bid package.

In the plans and specifications, the owner should provide information about unique safety issues that might not be apparent in a routine site visit (for example, hazardous materials on site, process chemical or other potential exposure, or known subsurface conditions). This information enables contractors to submit more knowledgeable and accurate bids.

Conducting the Pre-Bid Meeting

The pre-bid meeting with each prospective bidder gets the owner and prospective bidder together for questions and discussion about the project and bid documents; a site visit may also be scheduled. Here the owner can again demonstrate its commitment to safety.

In conducting the meeting, the owner's project team members should set a tone that encourages an open exchange of information.

At a minimum, the meeting should address the following:

- ▲ Any information related to known risks contractors will face in performing the work
- ▲ Permitting—what permits need to be secured for the project (including any permits required for particular work activities), and how to obtain them
- ▲ Applicable plant or site rules
- ▲ Applicable safety procedures
- ▲ Contractor orientation requirements
- ▲ Warning and emergency response information and procedures
- ▲ Owner's method and criteria for evaluating bids
- ▲ Owner expectations for:
    - Format/organization of bid responses

- Safety supervision by contractors

- Qualifications of contractor supervisory staff

Evaluating Bids

The owner's bid evaluation process should evaluate each contractor's safety history and assign it a numeric score that will either improve or impair the bidder's competitive position. This approach ensures that safety will be treated as an objective measure of bid responsiveness.

Proposals should explain the contractor's strategy for performing the work. The contractor should address what it perceives as critical challenges and known major risks in the project, and should affirm its commitment to preventing accidents and other negative events. The owner should meet with the contractor's staff and confirm that the contractor employs a functioning health and safety management system (see the appendix, "Construction Health and Safety Management System—Tactical Elements").

Contractors should also explain the process they use for selecting subcontractors, and should name any subcontractors they propose to use on the owner's project.

Preparing for Construction

After deciding on a contractor, the owner should meet the contractor's staff and reinforce key safety goals before work begins. As soon as possible after the award, the owner should schedule a post-award meeting with the contractor for this purpose. A second meeting during this phase will call upon the contractor to summarize its understanding of the project and its strategy for constructing it (pre-construction conference). Also within this phase, the owner should be taking steps to verify safety qualifications and, as appropriate, ensure completion of safety training by all owner, contractor, and subcontractor personnel who will work on the project.

Getting Acquainted: The Post-Award Meeting

In this meeting, owner principals are introduced to the contractor's site management leadership team and workers. While introductions may already have taken place during the bidding phase, the post-award meeting gives the owner an opportunity to reevaluate the level of involvement by contractor principals and reiterate the importance of safety.

A key goal of this meeting should be to review safety requirements with the people who will actually do the work. Although the contractor should already be aware of safety expectations by way of the bidding process, the owner should make certain that all staff who will be on site have a complete understanding of those expectations. Owners can supplement the contractor's internal communications system to transmit safety information to workers in the field.

In the post-award meeting, the owner should also notify the contractor to begin preparing for the pre-construction conference, which will require the contractor to demonstrate its understanding of the project.

Testing the Contractor: The Pre-Construction Conference

This meeting is a last opportunity for the principal parties (owner and contractor) to reassess their plans and expectations before the project moves forward.

The Presentation

The contractor's team should present its approach to safe project execution and its basis for decisions made up to this point. Owner personnel hearing the presentation will evaluate the contractor team's understanding and decision-making process. Other aspects of the contractor's preparation, including which team members they bring to the meeting, who leads the presentation, and what the presenters say, also give the owner insight into how the contractor organization will respond to job requirements and perform the work.

During the presentation, the owner should compare the contractor's statements with the contract requirements to assess the contractor's level of understanding. If presenters omit important items or demonstrate uncertainty, the owner team can pose questions and provide clarification.

Evidence that the contractor is prepared to work safely includes:

▲ Specific proposals for all major requirements, including submittals, processes, and high-risk or hazard areas

▲ Plans for project administration

▲ Mechanisms for avoiding foreseeable damage events

▲ Plans for responding to events they cannot foresee

▲ Strategy for overseeing and coordinating subcontractor work

▲ Grasp of how staffing, roles, hazard preparation, and other plans affect safety performance

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Evidence that the Contractor Is Prepared to Work Safely

▲ Specific proposals for all major requirements, including submittals, processes, and high-risk or hazard areas
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▲ Strategy for overseeing and coordinating subcontractor work
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Team Dynamics

The pre-construction meeting also allows owners to observe the interaction among key participants. Overt personality conflicts can impede team communication and add pressures that, ultimately, may lead to lapses in safety performance. Concerns about the team dynamic should be addressed before personnel are committed to the work and fully engaged.

Ensuring Safe Work: Validating Worker Training and Qualifications

The safety culture demands that workers—owner and contractor personnel alike—possess the skills and training they need to deliver maximum safety performance. The owner must begin by verifying that its own representatives have completed the appropriate safety training, understand the contractual requirements, and know how to evaluate contractor performance (especially on safety goals).

The owner should also confirm that the contractor's craft workers are qualified. This has been established during the bidding process, when the contractor provided details of its workers' prior training and experience, but equipment operators in particular may need to provide evidence of their qualification before beginning work.

Also, contractor employees should be prepared by attending specific training and orientation on the project site. Ideally, craft workers and management staff should not be allowed on the site before completing a site-specific safety orientation. The primary contractor should conduct the orientation, which should cover all information workers need to know before going into the construction area. Everyone who will be on the site should attend this orientation, including the owner's representatives.

Overseeing Construction

The owner's role during project construction is to maintain, through its leadership, the integrity of the safety culture established in the preceding phases. Some actions the owner can take to preserve that culture are listed in this section. During construction, the owner will also be monitoring safety performance (see Section 4, "Monitoring Safety Performance").

See and Be Seen

The owner's active presence on site is essential. Regular visits, including walk-throughs of construction areas, remind project workers that the owner values safety.

Set a Good Example

Owner personnel on site must model their own expectations for proper attire and personal protective equipment.

Stay Current on Project Issues

To prevent safety goals from becoming lost amid a project's many daily demands, the owner must know the challenges facing the project team. From this informed position, the owner can be ready to give advice and make decisions as necessary.

Communicate with Craft Workers

The owner gains several advantages by periodically discussing the project with the people actually doing the work. Workers' attitudes and practices are instrumental in achieving an injury-free project, and talking to them will help the owner evaluate the effectiveness of the contractor's safety management process. Through these discussions, the owner can also gauge the degree to which workers are aware of the owner's safety goals. Finally, interaction between the owner and craft workers helps build a sense of shared commitment.

Anticipate and Plan

Safety-conscious workplaces develop plans of action for both routine and unexpected events, including the following.

Incident Reporting and Mitigation System

This system involves developing protocols for:

- ▲ Reporting, documenting, and mitigating job site hazards
- ▲ Reporting safety incidents, including near misses
- ▲ Investigating incidents, performing root-cause analyses, taking corrective action, and communicating results
- ▲ Hosting visits by OSHA and insurers
- ▲ Setting metrics to gauge the degree of achievement (elements measured should include both normal performance measures and leading indicators)

Work Stoppage Plan

When a work stoppage occurs, potential dangers multiply. Owners can plan for this possibility by developing a plan for access control and management in the event work is disrupted by a labor dispute or other problem.

Reinforce, Reinforce, Reinforce

Many different types of job site programs can be developed to support safety goals. Owner commitment to such programs will demonstrate to stakeholders that safety is a crucial goal and a measure of success. Some examples of programs that keep the safety message prominent:

- ▲ A site/property management system for construction safety, to include:

  - A contractor processing system (possible elements include access management, substance-abuse testing, site-specific orientation, credential review, and discipline policy review)

  - Site/property requirements—easy-to-read information on site requirements and restrictions

  - Shutdown coordination and lockout/tagout procedures

  - A dedicated "Owner Safety Coordinator"

- ▲ Periodic "toolbox talks" to review any unsafe incidents or other safety concerns

- ▲ Continuous improvement programs, where lessons learned are constantly recorded and fed back to the contractor organization

- ▲ Recognition programs, in which companies and individuals who "live" the owner's safety philosophy receive meaningful rewards

- ▲ Safety auditing program, with audits directed at all levels of the project, reminding all parties of the importance of safety standards (see Section 4, "Monitoring Safety Performance")

4. Monitoring Safety Performance

Once established, the safety culture needs periodic checks by the owner to keep it functioning properly. Owners should monitor the contractor's safety performance during project delivery and, when necessary, act decisively to bring that performance into line with project goals and expectations.

Elevating Safety Over Other Project Demands

During construction, the owner must "walk the talk" on safety. Pressure to complete the project can cause owner and contractor personnel alike to focus excessively on cost and schedule issues, potentially neglecting safety. It is up to the owner to ensure that safety remains a major project goal and is not subordinated to other demands. Contractors and subcontractors will respond to this leadership by delivering what the owner demonstrates to be most important.

Ensuring Contract Compliance

Like any other requirement, the safety performance delivered by the contractor must meet the standards specified in the contract. Owners should constantly assess the contractor's safety performance and take corrective action as necessary.

Evaluating Job-Site Safety

Owner site visits do more than send a message about the importance of safety—they also give the owner a first-hand look at safety performance in the field. Owner representatives regularly read reports from the contractor and attend meetings to gauge work performance, but these activities do not substitute for seeing the work as it gets done. Site visits also allow the owner to compare observed work practices with written and verbal reports of progress.

The owner should talk periodically with members at all levels of the project team to validate that reports received are consistent with what is happening on site. If the project is performing as required, the owner should recognize the team's achievements. If the project is not meeting safety expectations, the owner must intervene in accordance with the contract.

Providing Feedback

Feedback should come in multiple forms throughout the project. It should result from ongoing communication between the owner's representatives and the site.

Recognition

When a contractor meets or exceeds the owner's expectations on safety, the owner should recognize the accomplishment. Recognition shows workers that the owner's representatives know what is happening on the project, understand the challenges workers faced in delivering safety requirements, and appreciate worker efforts.

Discipline

Negative feedback becomes necessary when safety standards are not being met. Actions taken should be consistent with the remedies provided in the contract. They may range from issuing instructions that will correct the shortcomings to removing one or more failing performers (at any level of the organization).

Final Critique

Contract completion brings an opportunity to evaluate safety performance yet again. Before any contractor departs from the site, the owner should hold a critique meeting. This meeting should be a dialogue, with the owner providing an evaluation of safety performance and the contractor giving feedback on the owner's involvement and influence on results.

Auditing to Enforce Safety Standards

The owner should develop and implement a system of formal, routine safety audits that reinforce safe work practices. By subjecting workers and vital work processes to systematic scrutiny, audits may reveal areas for potential improvement. When auditing is done consistently and at all levels of the organization, the owner can accurately evaluate the contractor's effectiveness at administering the project. Throughout, contractors must be made aware that the owner's audits do not substitute for the contractors' own safety audits.

A thorough auditing program should evaluate:

▲ "Artifacts of activity" such as other inspections, plans, records of safety meetings, and any other activities related to safety performance

▲ Physical areas throughout the site, to confirm that work practices reflect standards and match reporting done to date

5. Summary

Owners can make a difference in project safety and in peoples' lives. The outcome should be "because of" the owner and not "in spite of" of the owner. Adopting the principles, strategies, and tactics in this Safety Blueprint will benefit all stakeholders, especially those people who will be spared injury, illness, or death as a result.

For tactical, proven elements of a successful construction health and safety management system, see the appendix, "Construction Health and Safety Management System—Tactical Elements."

Appendix: Construction Health and Safety Management System—Tactical Elements

This appendix is intended as a **guideline** for developing a comprehensive construction safety program. While the elements and user practices described here merit consideration, not all will be appropriate for every workplace. The appendix, like the accompanying document, is not intended to impose any legal requirement on owners.

Presented here are fifteen health and safety management system elements and user practices. They have been extracted from statistically significant health and safety user practices in the construction industry through such affiliations as the Construction Industry Institute (CII) and the Construction Users Roundtable (CURT). For the purposes of this document, the term "user practices" is defined as those system features that have been associated with the reduction of incidents and injuries on project sites during project execution. In addition, the user practices and learnings listed here were deemed statistically significant in lowering project injury and illness rates and severity, and proved even more effective when used in concert with one another.

For more information on the elements included here, see the publications listed in the Reference Documentation section at the end of this document.

1. **Policy and Leadership**: The system should provide for communicating policies and demonstrating management's commitment to a health and safety culture that drives toward zero accidents and incidents. This requirement would apply internally and externally as appropriate to other stakeholders of the construction project. The system should include a means of confirming that the policies are accessible, communicated, understood, and implemented. Examples of this type of effective policy and leadership include:

   ▲ Project Manager is committed to health and safety and demonstrates it

   ▲ Owner provides extra funds (outside of contract) to promote project safety

   ▲ Owner participates in conducting project safety orientations

   ▲ Owner participates in daily pre-task analysis program

   ▲ Owner participates in safety recognition programs

   ▲ Contractor submits a safety policy signed by its CEO

   ▲ Project Manager has offices at project site with Project Management Team (PMT)

   ▲ Top management participates in recordable-injury and near-miss investigations

   ▲ PMT incentive program exists for both leading and trailing metrics

   ▲ Senior management reviews safety performance reports

2. **Risk Management**: Documented processes or procedures should be implemented and maintained to identify, assess, and manage existing and/or potential areas of health and safety over which the construction project can be expected to have influence. The scope of assessment(s) should include activities, operations, project, and products from the inception of the design and front-end planning through project execution, handover, commissioning, and start-up. The assessment should consider normal, abnormal, and emergency operating conditions. Assessment results and resulting action plans should be documented. A process should be in place to periodically review and, if necessary, update risk assessments. Examples showing effective risk management include:

   ▲ Daily pre-task Job Safety Analysis (JSA) occurs before work begins (supervisor)

   ▲ Job Safety Analysis is performed during task

   ▲ Facility is established for temporary PMT/contractor offices/buildings

   ▲ Due diligence studies have been performed where required

   ▲ Key inherent risks associated with the various tasks conducted during the project phases are understood (risk list by phase)

   ▲ Chemical Material Safety Data Sheets (MSDSs) and handling and storing procedures have been reviewed

   ▲ Security procedures are established

3. **Legal Requirements and Standards of Operation**: A documented process should be in place to identify, interpret, implement, and document all regulatory requirements and standards of operation applicable to the construction project. Some examples are:

   ▲ Contract requires a full-time safety professional on site

   ▲ Contract requires the contractor to submit the résumés of key safety personnel for the owner's approval

   ▲ Formal contract administration procedure exists

4. **Strategic Planning, Goals, and Objectives**: A strategic planning process for setting health and safety goals and objectives, and for establishing work plans for accomplishing these goals and objectives, should be included in the system and should be incorporated into the routine project planning/execution planning and goal-setting process. Employee involvement and stakeholder consultation in the establishment of objectives, and periodic feedback on progress in achieving them, should be incorporated into the system. Goals, objectives, and work plans should be consistent with policy, lead to continuous and measurable improvement, and support the creation of additional value and growth for the project. Significant issues identified from risk assessments, incident history, audit findings, legal requirements, stakeholder communication, standards of operation, and management reviews should be incorporated into this process. Examples of good strategic planning include:

   ▲ Project goal for Total Recordable Incidence Rate (TRIR) is set at zero

   ▲ Impact of working multiple shifts is considered

   ▲ Impact of extended work week is considered

   ▲ Contractors should submit a site-specific safety plan

   ▲ Contractor Safety Manager is exposed to client health and safety management system in advance of having a site presence

- ▲ Health and safety management system is incorporated into written safety plan

- ▲ Safety is a line item within the budget

- ▲ Subcontractors are required to submit site-specific safety plans

5. **Structure and Responsibility**: Roles, responsibilities, accountabilities, and relations necessary to implement and maintain the system and facilitate health and safety management should be defined and documented, with an established, effective means of communicating them. Both the owner and the contractor must understand what it will take to meet expectations. Project management should provide resources essential for implementation of the system and foster employee ownership at all levels of the project/construction organization, including subcontractors. The system should also provide for managing change in personnel and organizational structure. Examples of effective structure and responsibility include:

   - ▲ Supervisor area of accountability designation is in project grid

   - ▲ Personnel qualifications are reviewed for contractor safety and approved

   - ▲ Project Safety Manager reports to at least Project Manager level

   - ▲ Contractor shall place a competent safety representative on the project

   - ▲ Safety professional is on PMT staff in advance of having a site presence

   - ▲ Contractor PMT personnel qualifications are reviewed and approved

   - ▲ Line accountability of health and safety management system implementation and review is established

   - ▲ Client assigns personnel to parallel respective PMT position(s)

▲ Contractor safety management has a dotted-line relationship to PMT Safety Manager

▲ Contractors provide the same health and safety administration to all subcontractors

6. **Programs and Procedures**: Documented processes, programs, and procedures should be established and maintained to provide controls for the significant risks, legal requirements, and standards of operation identified in the planning process. Programs, processes, and procedures should be made accessible to employees, contractors, and government entities as appropriate. Examples of effective programs and procedures include:

▲ Substance-abuse program is in place

▲ Updated set of generic construction procedures is in place

▲ Compliance with appropriate personal protective equipment (PPE) requirements is 100%

▲ Site-specific health and safety procedures exist between generic construction and client to identify differences—the owner's and contractor's policies are reviewed and combined using the best from each for the specific job

7. **Asset and Operations Integrity**: Processes should be implemented to help ensure that integrity and reliability issues with the potential to cause a health and safety impact on the construction project are properly considered at all stages of the project life cycle. These issues include any integrity or reliability issue that is likely to result in a loss of containment or injury and should consider and incorporate, as appropriate: procurement; pre-construction health and safety assessment processes (e.g., design/execution considerations); process, mechanical instrumentation, and electrical system documentation; pre-startup review; structural integrity; safe work practices; operating procedures; mechanical procedures; and management of change. Some examples of processes are:

   ▲ Mechanical inspection programs for all rolling/moving equipment and compressors

   ▲ Comprehensive schedule/system for piping tie-ins

   ▲ Lockout and tagout procedures

   ▲ Permits (e.g., hot work)

8. **Emergency Preparedness**: The system should include a process for identifying and reviewing potential emergency situations and the planning for mitigation and control of incidents. Emergency response plans should be developed and maintained that address potential situations in construction that would require emergency action. Periodic drills and exercises are required to validate emergency response plan adequacy and effectiveness. Some indicators of emergency preparedness are:

   ▲ Complete project site emergency response plan

   ▲ Medical treatment facilities on site

9. **Awareness, Training, and Competency**: Each construction project should establish and implement a documented process that provides employees and contractors with the necessary skills, knowledge, and certification to perform work in a safe and environmentally sound manner. This training includes employee/contractor orientation, regulatory required training, and craft skills training. In addition, the process should address contractors by defining a method to communicate applicable site health and safety information. The level of training required should be based on the degree of inherent risk associated with the site and the complexities of the actions required to control or mitigate the particular risk. Measures should be in place to assess the competency of those trained and to determine the effectiveness of the training programs. The system should include processes to effectively maintain training records. Examples of awareness, training, and competency include:

▲ Contractor supervision receives training (for example, 10-hour OSHA program, first aid, CPR)

▲ Incentive programs are in place that include "immediate reinforcement" as a structured element

▲ Incentives are tied to leading metrics associated with the zero-injury objective set at the beginning of the project

▲ Supervisors are evaluated and rewarded based on written safety performance criteria

▲ Health and safety cultural alignment training takes place between owners and contractors

▲ Mentors are used (experienced craft personnel are assigned to the less experienced)

▲ Contractors are required to provide regulatory required safety training to workers

▲ A model scaffold is pre-built at project beginning to set an example for actual scaffolds

▲ Workers receive training each month

- ▲ Project managers and supervisors receive health and safety training each month

- ▲ Separate orientations occur for visitors, contractors and subcontractors, and vendors

- ▲ Orientations are formally presented

- ▲ All subcontractors attend a formal standard safety orientation

- ▲ Zero-injury expectations are shared and explained to all site employees

- ▲ Each individual worker receives safety training prior to performing any work on the job

- ▲ Contractor personnel new to the site are to be readily identifiable during an initial period (for example, with blue hardhats, special stickers, or yellow jackets)

10. **Investigation and Corrective Action**: The system should include processes that address investigation of non-conformance items, near misses, and incidents. Investigations should focus on determining root causes, with the objective of correcting latent deficiencies, preventing recurrence, and broadly sharing lessons learned in a timely manner. Examples of good investigation and action include:

- ▲ Safety rules are enforced from the very beginning of the project

- ▲ ALL incidents are reported without reprimand

- ▲ Investigations include appropriate members of owner's and contractor's PMT personnel

- ▲ Root-cause analysis is implemented in investigations

- ▲ Sanctions are issued for contractor and subcontractor non-compliance with safety standards, with project-wide communication for full understanding

11. **Communications**: Construction projects should implement processes or procedures to facilitate effective internal communication of health and safety-related issues, including awareness of the importance of compliance with regulations and policies and achieving health and safety goals and objectives, as well as the consequences of deviating from policies and established site construction procedures. Processes and procedures should also be in place to manage relations with stakeholders (workers, owners, labor unions, architects, engineers, and designers), in order to understand and respond appropriately to their diverse and evolving expectations via free and open communication. The public reporting of progress on economic, environmental, and social issues pursuant to sustainable development should be considered as part of the system. Examples of effective communications include:

   ▲ Weekly safety meetings take place

   ▲ Daily craft/task toolbox meetings take place

   ▲ Weekly project and safety management meeting reviews take place

   ▲ Workers are involved in meetings

   ▲ Written communication tool consolidates meeting information for dissemination to all project personnel on weekly basis

   ▲ Project-wide radio communication net is in place for all contractors on the project site

   ▲ Weekly project/contractor Safety Managers meeting takes place

   ▲ Subcontractors hold weekly safety meetings

12. **Document Control and Records**: Documentation should describe the health and safety system core elements and links to other elements, documents, plans, and processes. A process or procedure should be in place to maintain HS&E-related documents and records. The process should include a means to ensure that documents and records are accessible and can be identified and retained. Documents should be reviewed periodically and revised as necessary. Current versions should be made available, and obsolete documents should be removed or identified as being retained for legal use. Examples of good document control and record-keeping include:

   ▲ Contracts should include good practices where applicable (usually a list attached as a minimum)

   ▲ Safety meeting minutes are kept

   ▲ Project health and safety communication bulletin is issued, with a system of confirmation to ensure that supervision shares it with workers

13. **Measuring and Monitoring**: A process should be in place to measure and monitor the construction project's operations and activities. The process should assess the implementation and effectiveness of its operation controls, track health and safety performance, and evaluate the achievement of health and safety goals and objectives. Performance measures should be generated on a periodic basis appropriate for the project to provide project management with the tools to understand trends and impacts and establish future direction. Examples of effective measuring and monitoring include:

   ▲ Project maintains incident and injury statistics by each contractor on site

   ▲ Contractor incident and injury statistics are included in owner's safety performance

   ▲ Owner requires testing after project safety orientations

   ▲ Owner representatives regularly check project near misses

   ▲ Owners regularly check safety inspection records to monitor contractor safety performance

   ▲ Managers and supervisors receive behavioral overview training

   ▲ Multiple key user practice indicators are used

   ▲ Experience Modification Rates (EMRs) are not used as the sole criterion for contractor selection

   ▲ Incident severity and Recordable Incidence Rate (RIR) are used to evaluate contractor safety performance

   ▲ Formal worker-to-worker behavioral observation program exists on the project

   ▲ Safety perception surveys are conducted on the project

   ▲ Supervisors and managers observe safety behavior during work

   ▲ A requirement is established regarding the number of workers per full-time safety professional

14. **Audits**: The construction project should establish and maintain a documented procedure for auditing compliance with its legal requirements and standards of construction. The program should encompass all levels of contractors and subcontractors on site and should include client interface where potential health and safety impacts exist. In addition, periodic audits of the project health and safety management system should be performed to verify that the health and safety management system is understood and has been properly implemented. Examples of good auditing include:

- ▲ Quality of the contractors' and subcontractors' overall safety programs has been reviewed and approved

- ▲ A tiered auditing process is used, with compliance, individual system effectiveness, and appropriate systems in place

- ▲ Client/owner safety inspections are conducted frequently on the project

- ▲ Formal weekly scheduled audits take place with PMT/contractor management and worker participation

- ▲ Workers are involved in the auditing process

15. **Review**: Construction projects should implement a process for reviewing the status of health and safety compliance and performance. Reviews by safety committees or other review bodies should be at regular, documented time intervals, developed to ensure timely action on health and safety issues. Such reviews should be documented and should include incident statistics, leading-edge metrics, audit findings, incident investigations, and (good) user practices. Provision should be included for ad-hoc reviews of critical items. In addition, management reviews of the system and its effectiveness should be included and used as a tool for driving continuous improvement. The reviews should be at a minimum carried out periodically by the Project Manager. The reviews should assess system strengths and weaknesses and should include: any need for changes in policy, objectives, goals, or work plans based on changing circumstances and commitment to continuous improvement; resource allocation for system implementation and maintenance; performance measures; audit results; significant issues from risk assessments; and changing regulatory requirements. Indicators of a good review system include:

- ▲ Formal contractor evaluation and selection processes are in place

- ▲ Selection criteria are understood and agreed upon

- ▲ At project end, project management systems are reviewed and user practices captured and/or reinforced for use in future projects

- ▲ Contractor and owner policies are reviewed and updated to incorporate findings and provide for continuous improvement

- ▲ Management system is updated to incorporate findings and learnings from measures, audits, and respective review

Glossary

Co-employment – When a party other than the employer exercises or has the apparent right under contract to exercise control over the activities of the employer's employees, including their work methods or activities.

Experience modification rate (EMR) – An insurance term representing the ratio of an insured's expected losses to actual losses. The ratio is used as a multiplier to calculate (modify) the insured's current premium.

Front-end planning – The process that employs a company's resources (financial, facilities, human, and organizational) to translate market and technological opportunities into a capital project that is sufficiently defined to minimize changes during the production engineering, construction, and startup phases.

Job Safety Analysis (JSA) – A process of analyzing a job or task for its inherent risks, and then creating a document that identifies the risk at each stage of the task and the steps necessary to avoid injury/illness associated with the risk.

Near miss – Any work-related incident that had the potential to cause harm to an employee or damage equipment or machinery, but did not, merely by chance.

Root-cause analysis – A process used to analyze an unplanned event such as an injury, illness, property damage, or near miss for its underlying causes.

Safety culture – The shared beliefs, values, attitudes, institutions and behavior patterns of the members of an organization or group, which are reflected by what workers do when no one is watching.

Reference Documentation

- ▲ Business Round Table A-3 document, 1985
- ▲ CII Research Study PT 190
- ▲ CII Research Study PT 165
- ▲ CII Research Study PT 160
- ▲ CII Research Study, 1990, "Achieving Zero Incidents"

Construction User Roundtable Publications

The purpose of developing Construction User Roundtable (CURT) publications is to disseminate recommendations, guidelines, and reports developed by the Construction Users Roundtable. CURT is focused on improving the cost effectiveness of the U.S. construction industry. These publications have been developed from the point of view of owners or users of construction services. Efforts by all segments of the industry, however, are vital if major improvement is to be the result.

This publication is one of a series from committees or study teams addressing a problem area.

Findings and recommendations of The Construction Users Roundtable are included in publication series classified as White Papers (WP), Reports (R), or User Practices (UP). In addition to these classifications, CURT publications are numbered based on the category of the topic:

Category	Number Code
Constructability	001 to 099
Contractor Management	101 to 199
Cost	201 to 299
Interface Management	301 to 399
Workforce/Industrial Relations	401 to 499
Material Control	501 to 599
Purchasing	601 to 699
Quality	701 to 799
Safety	801 to 899
Security	901 to 999
Strategy	1001 to 1009
Work Planning and Scheduling	1101 to 1199
Technology/E-Sourcing	1201 to 1299
Special Projects	2001 to 2099

Examples:

WP-1201:   A CURT White Paper on Reverse Auction

R-402:   A CURT Report on Tripartite Initiatives

UP –801:   A CURT User Practice on Construction Safety in Contractor Prequalification
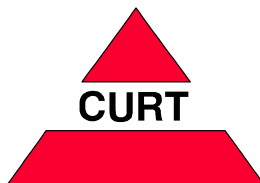
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