



NATIONAL ACADEMY
OF CONSTRUCTION

NAC Safety Position Papers from 2005- 2020

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Foreword

The National Academy of Construction (NAC*) Safety Committee has been issuing safety position papers to American CEO's and others since 2005 in an attempt to enlist and inform the users and leaders of the American Construction Industry on how some contractors with owner support are able to work millions of hours with no OSHA recordable injuries while most cannot. The successful users of the Construction Industry Institute (CII) safety research products have proven their value over and over again. The first Position Paper was issued on May 19, 2005, with the last issued in December of 2020. Since that time, subsequent papers focused on Safety are being published as NAC Executive Insights (EI) or NAC Proceedings. This Compendium provides most of the information provided in the original position papers including key points. If you desire the original source document, please contact NAC.

Unless otherwise indicated, these position papers were written by Emmitt Nelson. This Compendium was originally written and published in 2020 by Emmitt Nelson, with some updates made in 2023 by Edd Gibson and David O'Connor.

*NAC, established in 1999, is an organization of industry leaders— construction users, constructors, engineers, architects, consultants, attorneys, sureties, editors, and academics—who have made outstanding, life-long contributions to the construction industry. In addition to honoring the personal contributions of its members, the Academy provides its leadership and expertise to a variety of organizations, governmental and nongovernmental, for the betterment of the industry and nation as a whole, fostering collaboration, future improvement and building the next generation of leaders. NAC position papers were created from the experience base of NAC membership and are offered to America business and government leaders as answers to challenges facing American enterprise. NAC position papers were issued after review and consent by a majority of the current members.

The NAC Safety Position Papers
May 19, 2005, through December 3, 2020

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**NAC Position Paper (PP) No. 1, May 19, 2005, Is your company
among those who are performing construction work at zero injury
levels?**

The National Academy of Construction (NAC*) recognizes that a commitment to the “Zero Injury” concept pays large dividends both economically and societally.

NAC believes that business leaders who provide or use construction services should understand that the costs of worker injury have been reduced a total of \$50 billion per year when compared to average injury costs of the 1980’s. This sum is being saved each year by the owners and contractors who have been able to reduce or eliminate worker injury on their projects.

It is estimated that another \$60 billion per year in savings still remain. Are you interested in being more competitive?

It is statistically clear that proactive attitudes (by both management and workers) toward eliminating injury have dramatically reduced costs on construction projects. Leading owners and contractors have essentially eliminated both lost time injuries and fatalities. Many of those having this success are committed to the “Zero Injury” safety management concept.

As recently as the 1980s the OSHA recordable injury rates in construction exceeded 14 per 100 workers. By 2003 this rate had improved to 6.8. Driving this major improvement are increasingly greater numbers of major companies with recordable rates well below 1.0, with the best below 0.2; and many more joining the group at these and lower rates.

What is your company’s OSHA recordable incident rate?

Please join the NAC in encouraging the use of the “Zero Injury Concept” and in urging all to join in the improvement of our quality of life and the economics of construction. What better way to save American jobs and improve our lifestyle than to eliminate worker injury?

**NAC PP No. 2, November 1, 2005, The Zero Injury Concept produces
an amazing zero injury Record of 4,649,000 hours with Zero OSHA
Recordables.**

The National Academy of Construction (NAC) commends S&B Engineers and Constructors of Houston, Texas on two remarkable Safety achievements: 4,649,000 consecutive hours worked without an OSHA Recordable Injury, and more than 32 million consecutive hours worked without a Lost Time Injury during a run of over 53 million hours (1993 to 2003) with only one lost time injury.

S&B's amazing Zero Injury records become even more significant when they are compared to industry injury norms and translated into employee injuries that S&B actually avoided: While 2003 OSHA statistics reflect that the USA National Average for Recordable Injuries was 6.8 injuries per 100 workers per year, S&B's record of 4,649,000 work-hours resulted in the avoidance of 158 Recordable Injuries during the period from August 2003 to December 2004. Similarly, while the 1993 to 2003 National Average for Lost Time Injuries was ~4.3 for the period, S&B's record of 53,163,641 hours worked with only one Lost Time Injury during that time frame resulted in the avoidance of 1,140 Lost Time Injuries.

These remarkable achievements raise the question: "What kind of safety program does this company use to achieve such heights in the avoidance of employee injury?" The answer is that S&B takes full advantage of the Zero Accidents research done by the Construction Industry Institute, of Austin, Texas. This research gives the details of how to implement in your company the highly successful "Zero Injury Safety Management Concept." Hundreds of other contractors across the USA have joined S&B in successfully using this landmark research.

Such sterling safety performance protects the valuable human asset of a successful company.

NAC PP No. 3, May 1, 2006, The Zero Injury Concept is founded on Construction Industry Institute Research.

During the calendar year of 2004 the member companies of CII worked over one billion work-hours with an average OSHA total recordable injury incident rate of 0.88; seven times better than the OSHA/BLS National Average of 6.40. These companies are proving the CII research findings do work. Many ask the question of “What are the key ingredients of a zero injury safety initiative?” This third NAC Safety Paper lists the major categories of safety leadership found by CII to contribute to a zero injury result and again recommends that American Industry investigate these safety breakthroughs.

These are as follows: details of each category will follow in later position papers by NAC.

1. Demonstrated management safety commitment
2. Staffing for safety
3. Safe work planning; pre-project and pre-task
4. Safety education; orientation and specialized training
5. Employee involvement; behavior safety and safety perception surveys
6. Evaluation and recognition of safety performance
7. Contractor selection and management
8. Accident/incident investigation; including near misses
9. Drug and alcohol testing

NAC PP No. 4, July 1, 2006, The Zero Injury Concept is driven by “Demonstrated Management Safety Commitment.”

Demonstrated management safety commitment:

This “demonstration” must begin at the very top of an organization and has its roots in a heartfelt passion for the health and welfare of all employees. The term “commitment” is defined as a “personal devotion to doing whatever it takes to prevent an injury.” At the organizational top, this includes supplying the financial and human resources required for implementation of the CII research proven battery of zero injury safety management techniques. At lower management levels “demonstrated” means faithfully using those resources to effectively implement the various techniques comprised in the nine safety technique categories. CII research has proven the cost of this effort is returned at a rate of 400 to 500% per annum when compared to an injury incident rate equal to the National OSHA/BLS average for Construction.

NAC PP No. 5, Oct. 1, 2006, Success in achieving Zero Injury requires Adequate “Safety Staffing.”

Staffing for Safety:

In order for a “zero injury” culture of safety to exist it must be provided with safety coaching, orientation, training, compliance oversight and safety inspections and audits. These needs are best fulfilled by providing skilled safety professional staff in appropriate numbers to insure all these employee needs are furnished at the appropriate time. CII research suggests that having a safety professional for every 50 to 100 employees is about the right ratio in construction. This ratio is very dependent on the need for the services listed above. For rapid manpower buildup the 50 to 1 ratio seems about right, with the 100 to 1 ratio applying when there is a steady state employee count on the job site.

CII research has proven the cost of the utilizing the 9 CII zero injury categories is returned at a rate of 400 to 500% per annum when compared the OSHA/BLS injury rate average for Construction.

NAC PP No. 6, Dec. 1, 2006, Success in achieving Zero Injury requires “Safe-Work Planning.”

Safe work Planning:

The CII research revealed that when the work planning centered on safety as opposed to the work itself, improved work execution resulted coupled with a zero injury outcome. Typically, the schedule was improved and the cost was reduced, all because safety become a primary focus of work planning. This safety planning begins in the early stages of a project, is firmed with a pre-project safety planning session with all parties in attendance then executed in detail by the project superintendents, with pre-task plans by foremen and crew members as they create for each separate assigned task a specific “task specific safe execution plan.”

These plans are known by a variation of different terminologies but all are created by foremen and crew prior to task assigned work beginning. An adage: “It is obvious that work can be planned without consideration of safety but one cannot plan safety without planning the work.

NAC PP No. 7, Mar. 1, 2007, Success in achieving Zero Injury requires “Safety Education.”

Safety Education, Orientation and Specialized Training:

Employee safety education is a critical element in creating a culture of safety where zero injury is the natural result. Safety orientation is given all employees (new employees before they report to their foremen) on site-specific safety considerations which should always include the principles of the zero injury safety leadership process. These sessions (hours in length by many contractors) should never be simply videos alone. It is essential that both project safety leadership and line management take part.

Each and every orientation session should include a presentation by an appointed representative of top project line management who clearly informs the attendees of leadership’s commitment to them as individuals and to an injury free workplace and personally ask for each employee’s commitment to avoid all at-risk behavior. The natural result will then be all employees go home at the end of the workday injury free. Specialized training in pre-task planning and the safe usage of any unique tools (not commonly used) along with the appropriate use of personal protective equipment.

NAC PP No. 8, Apr. 1, 2007, Success in achieving Zero Injury requires “Employee Involvement.”

Employee Involvement, behavior safety and safety behavior surveys.

Zero injury leadership is empowered by various techniques of involving the employees in participating in the setting of safety objectives and goals thus enabling the employees to have a voice in what needs to be done and how to do it. This involvement necessarily comes after the employees have been given in-depth education on the research proven safety element content of a zero injury safety initiative. There are a number of approaches available to implement Behavior Safety. One technique trains the crafts who volunteer to do safety observations of peers. Data from observations is confidential and feedback is worker to worker. The data is tabulated as anonymous and reported back to the crafts. Another behavior approach follows the DuPont STOP process where supervisors are trained to observe behavior and give counseling feedback to the observed. All observation data is tabulated in an anonymous fashion and reported to all employees weekly/monthly as a measure of “safe behavior.”

A second craft involvement process uses independent persons to perform employee safety perception surveys. These reveal degree of craft buy-in to the zero injury safety initiative. Survey questions should be based on the CII research best practices and structured to determine quantity of technique usage along with quality of usage. These findings must then be shared with those surveyed. Putting the suggested improvements in place prove to the employees the depth of leader commitment.

NAC PP No. 9, June 1, 2007, Success in achieving Zero Injury requires “Evaluation and Recognition of Safety Performance.”

Evaluation and recognition of safety performance.

Performance evaluations of all employees should include one on one discussion of their individual safety performance. Ninety percent of the time leader discussions with employees are opportunities to praise individual safe behavior and also critically important (10%) opportunities to conduct safety coaching of employees in need of improved individual performance. These discussions should be held at least annually.

Further it is also of paramount importance that once zero injury performance is achieved group appreciation and recognition events should be held at least on a monthly interval. Other safety milestone commemorating gifts and awards are in order however the value of these recognition items should not exceed a nominal dollar value. The “not to exceed dollar gift value” should be below a value high enough to tempt employees not to report injuries in order to receive the award items. Gifts for long term “individual” injury-free performance are not advocated although “spot” awards for an individual’s unique safe acts of caution have been proven to be productive.

NAC PP No. 10, August 1, 2007, Success in achieving Zero Injury requires careful “Contractor Selection and Management.”

Contractor Selection and Management.

The objective is to ensure that all employees working on a project are schooled in the CII zero injury techniques and using them effectively. Proven successful implementation of the CII research yields a safety culture where employee injury is a very rare event to the point where the best will achieve record numbers of hours worked with no OSHA injuries.

It is essential that all contractors employed on a given construction contract understand and effectively utilize the nine CII safety leadership categories. This includes the prime contractors as well as the sub-contractors. Therefore, careful contractor screening is done by the owner and/or the prime contractor at the proposal stages of a project to ensure all contractors offering bids are indeed committed to the CII zero injury research fundamentals.

The screening process used to select eligible contractors should ensure each bidder has successfully implemented on recent projects the CII zero injury safety techniques. Careful scrutiny of each contractor’s approach to the utilization of the zero injury research should be conducted including interviews with the top contractor leaders that are being proposed to head up the project. Contractors entering the project execution process some months into the project schedule should also be similarly screened. Should a contractor be found to be in violation of safety commitments given, the CII research suggests that the offending contractor/s be sanctioned until the violation/s is/are corrected.

**NAC PP No. 11, October 1, 2007, Success in achieving Zero Injury
requires careful “Accident/Incident Investigation including Near
Misses”**

Accident/Incident Investigations Including Near Misses.

Prompt investigation of all accidents, incidents, injuries and near misses with appropriate feedback to all employees who might benefit with emphasis on feedback to the crafts personnel. CII research reveals that these investigations are best performed with input from those close to or involved in the incident. The investigative approach should be one of “fact finding” and not “fault finding.” The object is to obtain accurate information and it is felt this is best done in an atmosphere of cooperation as opposed to one of fear.

Regarding near-misses the research pointed out that the project with the best safety record also had the most near misses reported to project leadership. Such information is instructive since it is patently obvious that if events leading up to near-misses can be avoided so can the injuries that come in the wake of repeated near misses of the same type. With successful near-miss reporting the research also found a corporate stated near-miss policy defining a near-miss, setting forth a system of encouraging and recognition of near misses reporting. In order to successfully encourage the reporting of near-misses both the traditional embarrassment and fear that attends the reporting must be successfully prevented.

**NAC PP No. 12, December 1, 2007, Success in achieving Zero Injury
requires “Drug and Alcohol Testing.”**

Drug and Alcohol Testing

Routine drug and alcohol testing of employees was proven by the CII research to be an essential part of a safety culture where zero injury was found. There are six critical elements of this testing; 1. Every employee is tested including top management; 2. Initial testing is done prior to employees reporting for work; 3. A random testing protocol (short notice) is in operation; 4. Testing is done on a “for cause” basis; 5. Post-incident testing is conducted on involved employees; and 6. Drug contraband searches are made.

In the past 20 years most of the early issues that surrounded the introduction of drug and alcohol testing have been successfully addressed with the result that most all construction projects now have all six elements implemented. On sites where there are represented employees working there are implementation protocols that must be addressed in order to reach full procedural accord with the Unions. It is very helpful if the facility owner formally requests the job site have a Drug and Alcohol testing requirement. Another is to create a formal written Drug and Alcohol Testing Policy statement and insure it recognizes the pre-eminence of any state or local statutes that address work place Alcohol and Drug Testing.

**NAC PP No. 13, February 1, 2008, NMAPC Recognition of its
Member's Zero Injury Achievements is Benefiting Construction
Industry Safety**

NMAPC "Zero Injury Safety Awards" Annual Recognition Dinner

For decades, various means and standards have been used to recognize safety achievement in construction. But emerging in the 21st century has been a landmark safety performance recognition process by the Washington, D.C. based "National Maintenance Agreement Policy Committee," a tripartite organization of Labor, Owners and Contractors seeking construction efficiency. NMAPC works in conjunction with The Association of Union Contractors, headquartered in the Washington DC area. One of their initiatives has been to establish an annual recognition process for NMAPC members who achieve zero injury on projects for preset numbers of work hours. NMAPC has been holding its widely acclaimed Zero Injury Safety Awards Dinner for the past seven years. Those who have been recognized with zero injury awards under this initiative have amassed a multi-year total of over 50 million work hours without an injury.

The National Academy of Construction (NAC) congratulates all current and previous award winners and extends its commendation to NMAPC for establishing the Zero Injury Safety Awards. As far as NAC can determine NMAPC has the only such initiative in the world with a program of recognizing only zero injury safety achievements.

NAC PP No. 14, July 14, 2008, Taking Safety Commitment to the Next Level

Defining Corporate Executive Commitment to a Safe Work Place

All too often when corporate executives define their commitment to safety they do so in terms that are far too general. Many corporate executives make comments like “I am really committed to safety” or “Safety is our company’s number one priority.” These comments, while stated with sincerity by top executives, often lack their individual demonstrated personal commitment. Yet, research has shown that when top corporate executives demonstrate personal involvement with safety in the work place this role model sets the corporate safety tone and the results achieved in reducing injury are significant.

Top involved executives should remember “the ‘I’ factor” in stating their commitment to safety in the work place. The concept of “the ‘I’ factor” builds on the ‘I’ in the word commitment - Comm-“I”- tment. Safety commitment is taken to the next level when executives state their commitment in the present tense; “I am doing whatever it takes” to stop the next at risk behavior in this company, instead of saying, “I will do whatever it takes.” The replacement of “I will....” with “I am” clearly reflects the personal involvement and commitment by the corporate executive in the “here and now.”

Too often top corporate executives think that all at risk safety behavior occurs at the worker level, when in fact at risk safety behavior can begin at the top of the organization. The lack of active supportive behavior given to employee health and safety at the top corporate levels weakens safety commitment throughout the entire company infiltrating lower leadership even to the worker level.

Thus, the corporate executive who makes both the personal commitment and the financial commitment to safety will win favor with not only employees but investors. Careful accounting has shown that when a company eliminates injury in at the workplace it results in a 400% - 500% return on the investment plus it gains good will with its employees and with the community.

**NAC PP No. 15, September 7, 2008, Success in Achieving Zero
Employee Injury Requires Proper Safety Staffing and Utilization.**

Proper Safety Staffing and Utilization in a Zero Injury Safety Culture

In order for a “zero injury” culture of safety to exist it must be provided with two things according to the Construction Industry Institute (CII): 1. aggressive “line management leadership” in implementing the zero injury safety technology and 2. “safety expertise” for mentoring and coaching on zero injury best practices, orientation on safety and the zero injury concept, general safety training, safety planning oversight, safety inspections and safety audits along with incident/injury investigation and safety communication. The impressive safety responsibilities listed in (2.) above are primarily the domain of safety staff. Regarding staff organizations one should use care not to label the head of the safety support function as “Safety Manager.” Such a title for safety staff is not advisable for two reasons: a. implies that the job assignment is managing safety when in fact “managing safety” in a zero injury culture is the distinct role of “line management,” never safety staff and b. even in organizations where line management is routinely in charge of managing safety the use of a Safety Manager title would constantly send a confusing message to the employees. Acceptable titles include Safety Director, Safety Representative, Safety Staff, and Safety Specialist.

In zero injury cultures, safety staff is charged with safety support (training/education/orientation) and oversight (inspections/audits/compliance) only. It is line management’s job to insure all work has a safety plan and is executed according to accepted safe work execution practices.

The number of safety staff needed to support a zero injury culture was found by CII research to be somewhere in the range of one safety staff individual to every 50 to 100 project employees. The lower ratio of 1 to 50 applies when rapid buildup of large project workforces is in progress to insure efficient coverage of safety education, training and orientation while at the same time maintaining oversight of all safety support staff responsibilities for the execution of the work itself. Many factors impinge on the decision as to how many safety staff are needed: type of work, geographic area to be covered, amount of orientation, education, safety training contemplated, safety inspections and audits planned, the number of shifts being worked, etc.

Further, the top corporate safety staff position should report directly to the top corporate leader as peer to the top operational executives. This relationship of the safety function to the top empowers the safety staff to function independent of operations staff and thereby fill the safety oversight role more effectively. In the field organizations the safety personnel can and should have a clear secondary reporting relationship (sometimes referred to as “dotted line”) to the local operations personnel in order to properly fulfill the safety support role.

NAC PP No. 16, December 7, 2008, Success in Achieving Zero Employee Injury Requires “Safe Production” Planning

Safety Planning

When the initial CII Zero Injury Safety Research was performed in 1990-1993, the planning for safe work ranked high as a zero injury culture building technique. This planning is to be done in three distinct project phases: 1. Pre-Project Safety Planning, 2. Pre-job Safety Planning and 3. Pre-task Safety Planning. All affected personnel are to be in attendance, i.e. for 1 and 2, Top Project Leaders (both Engineering and Operations), Purchasing Executive, Project Safety Director, Project Engineers, Project Schedulers, Project Superintendents and Craft Superintendents. These meetings are called by and chaired by Project Leadership. Item 3, Pre-task planning is accomplished by the Craft Foreman and crew so the crew is all present when each pre-task plan is made.

Pre-Project Safety Plan

The CII research found a strong contribution to an injury free project when safety planning begins in the project planning stages and points out the benefits to injury free project execution. This means all parties to be engaged in the construction of a project should gather and spend significant time discussing the various phases of the project and what safety considerations should be observed during each phase. This should include site clearing, excavation, underground work, foundations, steel erection, equipment lifting and setting, piping installations, electrical, insulation and start-up. Each of these phases has distinct safety considerations that if planned and provided will enhance protection of the workforce from undue hazards.

Pre-Job Safety Plan

Each phase of the work is considered a job, i.e., excavation, underground, etc. This planning goes into more detail than safety planning accomplished in the phases mentioned above, heavy lifts included. It is timed to slightly precede the beginning of each phase. In these meetings all affected parties again go over the steps to be taken to accomplish the job and safety precautions highlighted and assignments made to ensure each aspect of phase execution and safety oversight is adequately covered.

Pre-Task Safety Plan

Safety planning at the Pre-Task level is in fact “Safe Production Micro-planning.” Prior to each task, foremen and crew devote the time necessary to plan properly the details of each specific task to be accomplished. This is typically craft-specific planning but at times can involve multi-craft operations. The foreman or a selected craft volunteer will lead the safety planning discussion, outlining each step in the construction sequence, and highlighting the safety considerations at each step. This planning is done using a Task Planning Form to record the details with emphasis on safety. Each member of the crew then signs the plan. Should any change be thought necessary then a new crew meeting is convened to reassess the plan, make any changes and then re-sign the plan. This procedure is followed at the outset of each new task. A given crew may prepare multiple Pre-task plans during the course of a shift’s work. As a minimum on repetitive or continuing work a new Pre-task plan is made by each crew at the beginning of each shift. The pre-task plans should be reviewed by the General Foreman and/or Superintendent during each shift to insure completeness, clarity, and quality. At the end of the

shift the pre-task plans are passed by the foremen to the superintendent and ultimately to the safety function for oversight and filing.

Safety Planning Truism

One can plan work and leave considerations of safety out;
However, one can never plan safety and leave the work out.
Plan safe production!

**NAC PP No. 17, February 1, 2009, Success in Achieving Zero
Employee Injury Requires “Safety Education, Orientation &
Specialized Training.”**

Safety Education

Safety education knows no exclusion; from CEOs to the line workers; all benefit from safety training and safety training properly achieved is a vital part of cultures of safety where employee injury becomes a very rare event. When “Safety Education” is underfunded and meager in content, it can be said that such results from “at risk behavior” by top project leadership in failing to provide the safety education resources proven to be effective in achieving a zero injury culture of safety.

All Employee Safety Orientation

The Construction Industry Institute (CII) research found TRIR improvements as high as “nineteen fold” when safety orientation was given every employee. The best performance was found when the following three initiatives were applied: 1. the orientation is formal, 2 both contractor and owner project leaders participate, 3 and comprehension testing was conducted to insure employee understanding. On reflection one can immediately see logic in the research outcome. When employees see an owner/contractor coordinated commitment to insuring all receive the same safety orientation, it is then the employees begin to believe the quest for zero injury is real and not just “safety talk.” Those projects that test after the orientation see improved attention and alertness during the sessions as the employees insure their personal comprehension of the orientation details.

Formal Safety Training

While many employers include some safety training during orientation, the CII research found benefit where projects provided both workers and supervision, including top project leaders, additional safety training. This additional safety training should always be project specific thus providing training in advance of need in many areas. Project leaders who for reasons of schedule or cost keep putting off safety training until “later” are in fact engaging in “leader at-risk behavior.” One could say an untrained worker asked to perform work for which he/she lacks recent training is an “injury in waiting.”

Specialized Safety Training

The CII research went on to conclude that those projects that were experiencing a zero injury outcome were giving all employees including supervision at least four hours safety training per month. Also the researchers found that projects that actually provided a project training budget were more effective. It goes without saying that to not spend the budgeted funds would be counterproductive. The frequency of training most prevalent was weekly with weekly supervisor training being a strong component. At first this amount of safety training seems excessive and too costly but when one considers the exorbitant cost of many typical injuries occurring to workers the informed know immediately that safety training is the “right” way to go; “right” for your employee’s health, “right” for long term productivity and “right” economically for the corporation; a “win-win” situation of rare proportions.

Safety Training Truism

“Zero Injury” is the daily outcome of doing a lot of little things well;
but “Zero Injury” when found, is no “Little Thing!”

NAC PP No. 18, February 1, 2009, Employee Involvement, Behavior Safety and Safety Perception Surveys

Employee ownership of safety is a key feature of a culture of safety where injuries are extremely rare events, even reaching 1,000,000 and more OSHA Recordable free hours in a continuous string. However, obtaining employee ownership is not an easy task, especially for those leaders who are accustomed to merely giving orders to obtain compliance to safety rules and procedures. Securing the critical employee ownership requires significant change in a leader's approach to safety culture development. The question is "How do I do that?"

The Construction Industry Institute research into why some contractors can achieve amazing numbers of injury free hours has answered that question:

Behavior Safety

The Du Pont STOP (Safety Training Observation Program) process was one of the first initiatives in this area. It is a supervisor-led program but in recent times has been extended into the hourly ranks by some companies. The essence of the program is observations of crafts at work with the objective being to detect any "at-risk" behavior. The observer then counsels the observed individual suggesting improvements in his/her work process. The anonymous observation data is then compiled into a data base. The resulting percentages of Safe Work and "At-risk" observations are periodically reported back to the crafts. The "At-risk" data is analyzed determining any safety training needs that might be indicated. Many other programs are also available from a host of. An internet search will find the details. Typing "Behavior Based Safety" in a Google search will reveal literally hundreds of places where assistance is available. However, the one key ingredient that one should never leave out is to "engage the crafts in a meaningful creative process" that allows the construction employees to make contributions to the design of the observation process you choose to use. This allows craft "ownership," and when you achieve craft ownership you have a very powerful engine to assist in driving your projects to a zero injury outcome.

Safety Committees that include hourly workers.

Safety Committees have been around for a long time; so long in fact that to some people they are interventions from the past. However, Safety Committees have proven to be extremely powerful ways of allowing craft personnel direct access to project leadership on safety matters. The most effective Safety Committees are those that are chaired by a top project executive, thus are not delegated to "only" the safety function to oversee and thereby promote craft ownership. The watchwords are to be "innovative and creative." The problem seen on union jobs has been the tendency to staff this committee with Union Stewards. While it is productive to engage the Union Stewards in safety dialogue, it is even better to also have a Safety Committee of a cross section of selected Trades personnel that are not Union Stewards. Early meetings with the Union Business Agents prior to project start to clear the way for installing a zero injury culture is essential.

In open shop situations the staffing of the Safety Committee should strive to select craft personnel who are natural leaders in the field work and who are also gifted with communication

skills. The committee should meet regularly and be led by a line manager or superintendent with the safety function.

Safety Perception Surveys

One of the top craft involvement processes is to conduct “all employee” safety “perception” surveys. The survey should be focused on the quality of the zero injury safety technique implementation. Few owners require contractors do this, and even fewer contractors do this on their own initiative, even though the CII research found it to be one of the top 24 items found in a zero injury culture of safety. Obviously, it will be best to have the survey conducted by someone outside the project leadership. Safety Perception Surveys should be conducted sometime after the job start up and after craft staffing is onsite. Designing the questionnaire is critical: First create a list of about 15 questions to ask. These questions should specifically address the zero injury culture elements you are trying to install. Design a quality rating scale of numbers, with word descriptors for each number defining what a rating with that specific number would mean. This has a standardizing effect on the outcome. The questionnaire can ask employees to indicate job type or position such as Craft. And within Crafts “time on the project” can also be useful in analyzing the survey data. Other personnel including Foremen and other supervisory personnel should also be included. All input is to be on an anonymous basis.

For instance, a survey question might be “Rate your experience with Pre-task Safety Planning:” A 1-5 quality rating scale might have descriptors as follows. 1 = Not understood and not used; 2 = Some effectiveness present, but often task understanding is weak; 3 = Used effectively most of the time; 4 = Well done, generally understood, and most crew members participate; 5 = Used effectively, with all crew participating. After the survey is conducted the data are tabulated and analyzed focusing on finding opportunity for improvement. Where an all-employee rating below 4.0 on the above posed question occurs, immediate refresher training in Pre-task Safety Planning would be indicated as a remedy.

Once the Safety Perception Survey is completed Craft feedback is mandatory. The survey can be taken in a few minutes during a 20-minute job safety stand-down. Insure “all” project personnel are invited to participate. After the data are analyzed, any remedial immediate action can begin immediately, and as soon as possible a second project safety stand-down is held to give all employees feedback on the survey results -- and just as importantly, what corrective actions are being taken by project leadership on the techniques that are determined to be in need of quality improvement.

Survey Truism

When Project Leaders conduct and take corrective action on employee Safety Perception Survey results, it proves to the hourly workers that “the safety talk is being converted into safety walk!”

**NAC PP No. 19, November 10, 2009, SMACNA Recognition of its
Members' Zero Injury Achievements is Benefitting Construction
Industry Safety**

SMACNA “Zero Injury Safety Recognition”

The NAC would like to recognize the Sheet Metal Air Conditioning National Association (SMACNA) for its annual recognitions of member contractors who achieve zero recordable injuries on projects. Since inception the program has recognized over 80,000,000 hours worked injury free. Zero Injury recognition will be given 12 SMACNA member companies achieving hours worked exceeding the OSHA/BLS standard 200,000 hours with zero recordable injuries in 2008. Several additional safety parameters are also used in screening successful winners. The following is excerpted from the *SMACNA News* highlighting the Zero Injury performance winners. A number of additional SMACNA contractors were also given recognition for lesser numbers of injury-free hours.

From SMAC News:

“We are proud to recognize the 2009 Safety Excellence Award Program winners in the following man-hour categories.... First-place winners will receive their awards at the SMACNA annual convention in Palm Desert, Calif. in October 2009. Second and third place winners will receive their awards by mail. The 2009 award winners are:

Over 500,000 hours

University Mechanical and Engineering Contractors – Tempe, Ariz.,
The Murphy Company – St. Louis, Mo.
BMW Constructors Inc. – Indianapolis, Ind.

400,001-500,000 hours

Couts Heating and Cooling Inc. – Corona, Calif.
Temp Control Mechanical Corporation – Portland, Ore.
Plumbing and Mechanical Contractors Group – Milwaukie, Ore.

300,001-400,000 hours

CMC Sheet Metal – Capitol Heights, Md.
J.M. Brennan Inc. – Milwaukee, Wisc.
E.J. Bartells – Renton, Wash.

200,001-300,000 hours

NEWJAC Inc. – Lebanon, Ind.
Alliant Systems LLC – Beaverton, Ore.
Technical Building Services Inc. – Ballston Spa, N.Y.

The National Academy of Construction congratulates all current and previous SMACNA award winners and extends its commendation to SMACNA for establishing the Safety Excellence Awards recognizing Zero Injury achievements by SMACNA members. NAC also extends congratulations to the Sheet Metal Worker’s International Association and its Local Unions for their support of contractors seeking to achieve Zero Injury outcomes on each and every job.

NAC Position Paper No. 20, June 18, 2010, Combating the Negative Effect of Safety Incentives/Bonuses

It is true that contractor bonuses/incentives based on the absence of injury or for lower injury/incident rates often result in a severe negative impact on real safety. This need not be the case.

A recent article in the Christian Science Monitor (see below) mentioned a trend among the off-shore oil industry owners in the North Sea to use “pay incentives/bonuses” to increase the attention that responsible executives give to work safely. The article also mentioned the common practice of using “light duty,” which is to use an injured employee in an alternative assignment during the employee’s recovery. Both of these practices, the “paying of incentive/bonuses” and the use of “light/restricted duty” are frequently used and both have proved productive in improving safety results, but are both vulnerable to misuse and abuse.

These practices are not limited to the North Sea but are generally in use worldwide in the industrial sector where Contractors and Sub-contractors are used extensively.

Article in the Christian Science Monitor

“Eyeing BP oil spill, British question if North Sea oil firms also push bounds of safety

The BP oil spill has drawn attention to companies' safety records in the North Sea, where an oil rig explosion killed 167 men three decades ago.

Excerpt follows:

Working on tight margins in the North Sea, which is less lucrative than the Gulf of Mexico, oil companies have come to rely heavily on subcontractors. They pay bonuses to subcontractors that demonstrate a low rate of accidents and injuries. But Professor Beck says that such bonuses have become an incentive for subcontractors to hide safety problems.

“The real main issue is under-reporting of accidents and safety issues,” he says. “Conditions in the North Sea are very rough, the natural hazards are much greater than in the Gulf of Mexico and the oil is also expensive, so in a sense it’s one of the less profitable oil provinces.”

Jake Molloy, a trade union representative for oil industry workers, says that “real improvements” in safety culture have been made over recent decades. But he expresses concern about the role played by safety performance related bonuses on drilling operations.

“Just on Wednesday, a lad suffered a serious injury when a piece of equipment hit him in the face and had to go onshore for medical treatment,” he says. “The company then asked him if, on completion of the treatment, he would come into the office – the objective being to disguise the lost time from injury being recorded and ensure that the performance-related bonus was paid.””

Regarding the mentioned “come into the office light/restricted duty opportunity” in the USA the OSHA rules for the reporting of employee injury allows for both restricted duty and job transfer in cases where the physician approves and thus are not properly labeled a “disguised injury.”

Studies have proven that injured employees recover from injury much more rapidly if allowed to perform some type of productive work by the employer.

While the practice of using “bonuses” and “light duty” is mentioned in negative light in the CSM article it is safe to say that most companies who use these techniques do not do so with the intention to force the hiding of injury. In saying this I do not doubt that there are instances of abuse for I too have seen such abusive action. However, research has proven the value of rapid return to work policies which improve recovery times and decreases the economic impact of the injury on the employee’s financial wellbeing.

With research done by Sun Life Insurance in studying over 1000 cases –

- Sun Life concluded that early intervention in short term disability cases can overcome two main barriers:
- Psychological: The disabled employee hasn't mentally adjusted to not working and his or her new lifestyle without work.
- Work: A close relationship still exists between the employer and employee, and everyone remains focused on recovery and return to work. Before long, an employee can quickly become "out of sight, out of mind."

Real savings

Employers that don't pay attention to the potential rewards of return-to-work programs may pay a high price, says Sun Life. "Employers who ignore the importance of early intervention risk higher absenteeism, higher staffing costs, and lower productivity." Employers who implement early intervention programs can reap real savings between 18 to 20%. See URL: <http://www.insure.com/articles/disabilityinsurance/early-intervention-costs>.

Beginning in the early 1990’s in the USA large companies began a concentrated safety intervention in Contractor and Sub-contractor safety because analysis revealed that the costs of safety non-performance was contributing substantially to costs of contracting and the buyers of these services were having to pay for the inefficiencies caused by high injury rates. For instance, in the late 1980’s the OSHA average injury rate in construction was 14+ cases per 100 workers compared to a 4.7 rate in 2008. Also with so many injuries there came the all too frequent third-party lawsuit. In the mid-1980s one large owner in the USA was spending over \$100,000 to handle each case and this cost did not include settlement costs. With 180 such cases on the books the cost well exceeded \$20,000,000 and this cost did not include the cost of court awarded sums.

The source of the safety intervention methodology was the Construction Industry Institute (CII), Austin, Texas, (www.construction-institute.org). This research institute looked at 122 projects over a 10 year period with five research task forces and reported that if certain leadership approaches were used then injuries could be substantially eliminated with some even achieving injury free work for millions of hours.

This CII research resulted in detailed means and methods of creating a very positive and wholesome safety culture in a work group where employee injury was reduced drastically. Such

an injury free safety culture is all about how people are treated, and the CII research based management processes used to provide the workers involvement opportunities, so they become co-owners and actively assist in creating the safety culture. During this time period most owner executives were very familiar with the details of the CII Zero Injury research and contractor oversight was largely along the lines of assuring the use of the research with a lesser focus on the final result in the lagging indicator of OSHA injury rates.

Seeing the economic advantages of a zero injury product a number of owners developed safety incentive packages for the contractors based on low to zero injury rates. Both contractor and owner also developed in-house incentive plans for executives based on a zero injury outcome. Initially in the safety incentive/bonus process it was given that the application of the zero injury research results would be installed by the contractor and the owner would monitor and audit the contractor's safety culture to ensure the research interventions were in fact being used. Few bothered to incentivize the use of the CII research results, instead just the outcome of zero injury. Incentivizing a zero injury outcome (a lagging indicator) without also incentivizing emphasis on the utilization of the CII Zero Injury research details (leading indicators) became the norm in many owner and contractor organizations. . One can anticipate the problem resulting from this scenario.

In a few years it seems owner turnover took its toll on the in-house zero injury expertise and slowly the owner focus switched from research utilization to the simple expectation of a zero injury result with little if any attention as to how the contractor achieved the result. Likewise in the contractor community, also due to turnover, the detailed knowledge of the CII Zero Injury research details faded, again leaving the clear expectation from the contractor CEO of a zero injury outcome.

This scenario places a skewed focus on the outcome without focus on the process. Such an approach has continued to unfold. In many cases today we see the concept of working injury free accepted worldwide with many having lagging indicator incentives in place to reward those achieving zero, with little if any attention being paid to ensure the CII research safety technology is in place and functioning well.

This scenario of a "supervisor under stress" to produce a zero injury outcome without emphasis on the proven CII process has caused a significant problem with injuries not being reported by lower supervision or being managed in such a way as to avoid injury recordability. And as one might expect with lower supervision "demanding" zero injury, workers are much less prone to report an injury out of fear of job loss.

The answer of course is to use the research details. It would make this article much too long to give even a brief tutorial on the application of the CII research. So, I will end with a challenge to those wishing a "true zero injury" safety result to go back to the basics. Redesign your safety bonus/incentive system to avoid a focus only the outcome. Use the leading indicator concept and measure your success against a detailed CII research application standard that is audited for quality.

Only through the effective use of the research, is there reason to believe the claimed safety performance in fact is a true representation of the safety culture. Also know that work accomplished without worker injury has been proven to improve schedule, rework and profitability with a typical ROI of 300 to 500%.

Info available from: www.construction-institute.com or www.naocon.org or simply do an internet search for the two words “zero+injury” to find other sources of information and or assistance.

NAC PP No. 21, October 1, 2010, Supervisor Performance Evaluation Including Safety

Research by the Construction Industry Institute (CII) found that when the safety performance of construction supervisors is regularly evaluated with results communicated to those supervisors' safety performance is significantly improved. Safety performance evaluations are listed as number 3 of the top 24 safety techniques found by CII to be in use when a performance of zero recordable injury was found.

Even with this very direct information there are many companies that do not capitalize on this finding. A common response found by the Zero Injury Institute (ZII) when individuals were asked if their employer has evaluated their safety performance in the past 12 months was; "I must be doing okay because I have not been criticized lately. You see my boss is quick to tell me when I do something wrong, so I must be doing fine."

Looking at "the nature" of "human nature" will help here. A number of studies over the past 60 years have found the same results on what is tops on the list of what employees want from their jobs. All these studies found that "being appreciated" was near the top if not the top item. Even money or wage often ranked lower in the list. <http://www.selfgrowth.com/articles/Dunn110.html>

The point?

"Praise" then is a powerful employee motivational tool. In light of this finding the question then is; "Do we praise our employees nearly enough?"

Given an average workforce, it is easy to believe were employee evaluations conducted at least 90 percent of the performance evaluations held would result in employee praise. What could be more powerful to improve operations?

Recognize, if you begin employee performance evaluations that "safety" is but one performance area that will benefit from formal evaluations. Every employer has perhaps six to ten performance criteria that are being used unconsciously as leaders decide who is best in performance. Safety performance is only one but a crucial one; leadership skill is another and, for creating a zero-injury safety culture, both are extremely important. Other important performance criteria can be included as well.

Some readers will allow their imagination to build this evaluation effort into a giant battery of work that seems far too daunting to achieve. To ease this concept, these evaluations do not need to be so extensive that they become a dreaded event for the leaders to undertake. They can be as brief as one page, perhaps even less; but to not do any evaluations is missing an opportunity to tell each of your employees they are doing a fine job for you, that the company sees their performance and appreciates the individual's contribution to a zero-injury work site. This is called PRAISE! CII research shows safety improves when praise is given!

When looking at an employee population easily 90 percent of your employees will be receiving praise, with just 10 percent or less receiving coaching on how they can improve. Performance

evaluations reflect a “caring” attitude about your personnel. To not evaluate performance and especially safety performance is to indicate to employees by lack of emphasis, that safety is not that important despite what you think you are saying otherwise.

Construction is accomplished in a manner that uses represented or non-represented craft employees for relatively short periods of time. Evaluations for craft employees can be especially important in these short bursts of activity. With evaluations, you can have a significant, positive impact on the culture in any given union hall or open-shop region. Over time, these employees come to appreciate your safety emphasis and the subject of zero-injury becomes a topic of discussion in a positive vein even when your company has departed the area. And your firm becomes an employer of choice when you do return.

ZII experience around the USA in interviewing represented and non-represented craft workers have also found these workers very appreciative of an employer who pushes safety as a value. Through this evidence, ZII concludes when a truly caring employer attitude for the health and well-being of the worker is present critical worker safety buy-in occurs. A frequent remark heard is, “I have never worked for a company so safety conscious.”

For a company engaged in the construction industry, including Owners, Construction Managing Companies (CMs) and Contractors wishing to perform at world class safety levels, all employees benefit from at least an annual performance evaluation with an emphasis on safety. Many owner companies do have performance evaluation systems in place, and those that set a high emphasis on safety will typically experience world class safety performance as does, for example, du Pont de Nemours. With this example it is logical to assume CMs would benefit as well. From experience ZII sees only a very few construction companies giving performance evaluations to staff with feedback and even fewer to craft workers.

The technique of evaluating safety performance regularly with employees is perhaps the hardest of all safety leader concepts to implement with consistency. The typical trap leaders fall into with the evaluation technique is getting so far behind schedule that they give up on ever catching up, so the system fails. The answer is to keep them brief perhaps a check-off list only for hourly waged employees will suffice. It is the “praise event” that matters not the extent of the record kept.

Performance evaluations, well done, provide improved resource management. Including safety as a portion of the performance evaluation promotes a positive personal improvement by each employee in working as a team member to ultimately achieve your safety objective: zero-injury.

If your company wishes to become truly world class in safety, then including safety in performance evaluations is one of the research proven criteria you will want to embrace.

NAC PP No. 22, April 1, 2011, Viewing Construction Safety from a “Value Platform”

Many senior executives in the business world of the 21st Century have firmly decided the most important aspect of creating a successful enterprise is ensuring the corporation “values” the right things.

Identifying Sought After Values

From typical construction company web sites the following 18 “corporate values” were cited. They are alphabetically listed as follows:

Caring, client service, commitment, do the right thing, excellence, fair return, honesty, innovation, integrity, progressive, quality, respect for others, responsible, safety, service, stewardship, teamwork, and trust.

Viewing Values

Allegorically we can imagine this list contains the “values present in the image” corporate leaders want their company to consistently reflect; today and tomorrow! Further imagine, if you will, each “value” having a corresponding “window” on a “value platform” through which the top corporate leaders view the company’s operational success in establishing the corporate presence in the marketplace. Ensuring the company reflects to employees, customers, shareholders and community this “platform of values” provides the leaders an ever present “foundational purpose” from which to operate. As top corporate leaders work from this “value platform” they are reminded of the desired underlying crucial determinants they collectively feel must be satisfactorily met to reach success.

On the Above Value Order

In the realm of safety, nothing is more important than the first value on the list; that value being “appropriately demonstrated caring.” “Caring” is the reason we pay so much attention to safety. “Caring” is the reason we apply so much safety emphasis. Caring is the reason we have so many legislated safety compliance requirements. Collectively as citizens, as corporate leaders, as employees, as children of parents who go to work each day, and even as uninvolved bystanders, we “care.” So if we “care” so much and so completely why is it we still find so much injury in our workplaces?

An Answer is Found in a Value Review

In a play on words; we all know it is “safe” to say “everyone cares about safety.”

Among the web sites viewed “safety” was most often listed, with “integrity” and “honesty” next. Most readers will likely agree “each value” on the above list when realized will be found to be a product of the properly structured application of the first on the list, “caring.”

1. When we care enough about the welfare of our client and we apply “teamwork,” it is then we can see “client service” in action.
2. When we care enough about the task at hand, it is then we can see our “commitment” revealed.

3. When we care enough about our “honesty and integrity,” it is then we can be “trusted” to “do the right thing.”
4. When we care enough about being “innovative and progressive in ensuring the quality” of our effort, it is then we can rise to the performance level known as “excellence.”
5. When we care enough about our “stewardship,” it is then we can realize corporate financial health with a “fair return.”
6. When we “care” enough about being “respectful and responsible” in our “service” to our fellow employee, to our client and to the public, it is then we can truly realize “safe” outcomes in our lives.

Yes, for success, safety has to be more than just a “value” in how we view things at work; safety has to be built into our life style; valued in all our activities, in our communities, at home, on the way to and from work, and on the job.

There is no greater value than “safety” and there is no better value than “caring” to ensure our “safety” success.”

How Should we Show our Caring?

However, the “manner in which we show our caring” is likely more important than “caring” in first place. “Caring” is the foundation of a successful safety culture where leaders avoid resorting to a totally ruthless demanding stance on safety; rather displaying the many “caring” factors of demonstrated safety leadership. Mandating safety has been proven to not work by driving safety incident reporting underground and alienating the workforce. True “caring” by all, creates a bond between safety leadership and the workforce. The leader “caring” must be highly visible and sincere. Since no one wants to get hurt, those that achieve zero recordable injury use supportive safety processes that empower people to be “safe”. One is the authority to “stop work” for anyone on the project that sees or senses something might be at risk. In a zero injury safety culture the value of life and limb is shared by all; a value held by leaders and workers alike so that nothing has a higher degree of importance than safety.

From those employers who achieve a zero recordable workplace we learn they use a “no fault” approach to investigating safety incidences. They demonstrate “caring” in ways that cause the employee to feel more allegiance, more loyalty and more appreciation and with these feelings come a more dedicated employee. And what would you say the employee “caring” factors of allegiance, of loyalty, of appreciation, of dedication yield? They collectively yield the all-important competitive edge you are seeking; they yield improved “production” some are now referring to as “Safe Production!”

Safe Production: The Product of Caring

Thus “safety” is clearly the “platform value” that will drive success when “caring” is the “primary value”; yes even “first in the value order rank of values.” A fact from the experience of those successful in virtually eliminating injury among their employees is you must “effectively show” more than anything else you “care” about the wellbeing of each employee. This proven “caring” yields the underlying power that energizes the hearts and minds of all, leader, and worker alike, to live and work injury free.

In brief, one can say, “Appropriately applied caring is a root cause of an incident free work place.”

Finally, "caring" creates a workforce bond; an all employee alignment and trusting relationship among the workforce which is of paramount importance. With this bond it is then we will see the highest possibility of having “zero incidences/accidents/injury today and for a long string of tomorrows!”

NAC PP No. 23, July 25, 2011, NAC Wants to Recognize and Commend those Contractors Achieving One Million Hours with Zero Recordable Injuries

Beginning in 2011 the NAC Safety Committee has been recognizing and commending those industrial and maintenance contractors in North America who have been reported to have surpassed in 2011 the One Million hour mark with zero BLS OSHA Recordable Injuries on projects or company-wide. To date the committee has knowledge of only 23 such reported occasions in the past 22 years. The purpose of this Safety Position Paper is to bring attention to this group of contractors that have reported accomplishing this amazing achievement and thereby cause others to seek answers to the question; “How do they do that?”

History of Zero Injury

Historical development of the Zero Injury Benchmark dates to 1987 when the Business Roundtable Construction Committee first recognized an owner and a contractor for Safety Excellence by recognizing Win-Way, Inc. a contractor of Freeport, Tx. and Air Products, an owner of Allentown, Pa. Winway had worked 4.8 million hours over four years with zero lost time injuries while Air Product’s contractors worked 2 million hours over a period of two years with zero lost time injuries. These two records actually triggered the Construction Industry Institute (CII) to launch the initial “Zero Accidents Task Force” to begin the original safety research work.

The advent of the “one million hour” threshold was solidified with this initial research by the CII which was conducted to answer the “How do they do that?” question. The Task Force looked at 25 projects and reported their results in the 1993 CII Report “Zero Injury Techniques” which became a best selling product of CII for the next 10 years.

The contractors and owners utilizing the 1993 research result soon began to achieve records exceeding 1,000,000 hours with zero BLS/OSHA Recordable injuries, which industry participants viewed as nothing short of amazing. Wanting to explore these achievements further, CII soon launched the ”Making Zero Accidents Happen” Task Force which conducted three additional batteries of research over a period of five years. As a result of all this CII attention the “one million” hour threshold became a commonly used measure of safety achievement that was beyond the norm and thus worthy of attention.

The Advantages of Publicizing Success

NAC has concluded that the challenge of achieving the one million hour threshold is so important to the industry that maximum publicity should be given to those organizations reported to have achieved or surpassed this mark. The objective of NAC is to challenge the vision of all in the industry to embrace the CII research and free those individuals otherwise destined to be injured from that fate.

Even though NAC can in no way certify the absolute accuracy of the records, it is been calling attention to all those organizations that have reported their one million hour accomplishments.

Specific Examples Listed

The barrier breaker or first known construction contractor to exceed one million hours worked with zero BLS OSHA Recordable injuries was Zachry, of San Antonio, Texas on a 1989 Shell Chemical Project near Baton Rouge, Louisiana. Since that time there have been only 22 other occasions where one million hours recordable free have been reported. Although a complete and accurate listing may never be achievable this fact should not dissuade us from recognizing and commending those amazing one million hours plus records that have been reported.

Through this Safety Position Paper NAC is listing the names of known contractors reported to have reached and exceeded the one million hour milestone, though a goodly number of them have exceeded two million hours and even three million hours worked with zero BLS OSHA Recordable injuries. Yes, and two are have reported exceeding four million hours recordable free.

An easy way to mentally embrace the magnitude of one million hours worked is to think of it as equivalent to 100 workers being on the job 1250 workdays or five years injury free. This performance is both amazing and worthy to be recognized by NAC.

The List

OVER 1,000,000

Zachry – 1,020,000
Shell Chemical, LA, 1989
NPS Energy Services* - 1,000,000+
Peach Bottom Power Plant. –1999
Parsons - 1,229,585
Exxon, Baytown, TX - 2002
J. H. Kelley*– 1,036,746
Conoco Phillips–OK, 2005
BMCD – 1,000,000+
Conoco/Phillips, TX- 2005
Cherne Contracting Corporation* –1,500,000+
Sunoco & E. KY Power, MN – 2005
Superior Construction* – 1,000,000+
BP Whiting, IN – 2006
McCarl's* – 1,020,785
York Haven, PA - 2008
CECO Construction - 1,100,000
Houston, TX, Companywide – 2005, 2006
Chapman Corporation* – 1,081,486
Canonsburg, PA – 2009
D.E. Harvey – 1,149,192 Chapman San Antonio, TX
- 2010
AltairStrickland – 1,371,269
BP Texas City, TX Operations - April 2011
M.A. Mortenson Construction – 1,034,847
Minneapolis, MN – Company Wide – May 2011
Bechtel – 1,145,123
BSII – Savanna River Water Treat, GA - 2011
Bechtel – 1,118,005
Watts Bar Unit 2, Knoxville, TN - 2011
AltairStrickland - 1,201,865
Internal own employees Company Wide Jan 20, 2011 –
through June 7, 2011

OVER 2,000,000

Fluor – 2,080,000
Lake Charles LA - CITGO, 1996
Cherne Contracting Corporation* - 2,547,240
Minn., MN – Company Wide, 2000-2001
Solid Platforms, Inc.* – 2,569,257
Whiting, IN – BP Refinery - 2007
Cherne Contracting Corporation* – 2,150,000
Companywide - Minn., MN- 2010-2011
S&B E&C Construction – 2,541,797
On site hours, Port Allen, LA – 2011

OVER 3,000,000

S&B E&C – 3,288,884
Port Allen, LA – Total Project Hours, 2011

OVER 4,000,000

S&B E&C – 4,649,000
Houston, TX, Company Wide- Oct 2003/Dec
2004
Kiewit-Southwest – 4,180,752,
Phoenix, AZ – District Wide 2011

*Union

NAC PP No. 24, January 10, 2012, The Zero Injury Safety Question of the 21st Century; “Are you ready to Change yet?”

Fact: Change is a necessary element of progress in any field. One could say that “positive change,” straightens, levels and paves, the highways of progress. The positive effect of such a “change for progress” in Construction safety as measured by BLS/OSHA incidence rates has been substantial over the past two decades. In 1991 the “all industry” BLS/OSHA recordable injury rate was at 13.0 per 100 workers per year; in 2010 the rate was 4.0, an improvement of 69%. The root of this improvement has been the willingness for corporate leaders to “change” how employee safety is managed.

The “change” has been to add to the OSHA compliance driven safety something new called “leading indicators.” The BLS/OSHA injury rates cited above are known by those knowledgeable in construction safety matters as “lagging indicators.” To operate a safety program in the “lagging indicator” format is to place emphasis on those equipment, tools and hardware problems that have in the past caused injuries; i.e., improper scaffolding techniques, not using fall protection devices, not securing objects at elevation to ensure they are not dislodged and fall endangering those below.

Many corporate leaders are now using the CII concept of “leading indicators” to create their safety cultures. “Leading indicators” can be defined as the measurable things one can do for, with and through your people that are safety culture building in nature. The way to empower “people centered safety” is to allow your people to become involved (staff and hourly) in the design of the safety culture content around and centered on the avoidance of “at-risk” behavior. Leaders can be just as at fault in using at-risk behavior in the decisions they make in planning the work as the craft personnel are in the decisions they make in executing the work. Those who have added “leading indicators” as a part of their safety emphasis labeled OSHA compliance as the ‘Hard Side of Safety’ and have labeled the use of “leading indicators” as “The Soft Side of Safety.” “Hard” refers to the hardware of construction. The “soft” refers to the “people” involved.

Emphasizing the “soft” side of safety requires placing the “people and their well-being first” in creating a culture where being and working safe is the primary emphasis each and every day in everyone’s approach to accomplishing the work to be done. Placing people first is more than putting safety first. When people are placed first in a “leading indicator environment,” zero injury safety results is the natural byproduct and all other considerations such as cost, production and schedule are viewed as second tier concerns. This is not to say that being second tier is not important because all know that cost, production, and schedule requirements must be met for a project to be successful. It is not “rocket science” for your people to know the importance of a successful project. It seems it is human nature that your people want to excel when they have been made aware that beyond all other things, they and they alone comprise the first tier. These firms readily believe that their employees are their greatest asset.

It is now well known that there is a publicly available battery of “leading indicator” injury prevention strategy based on pure academic led research that if used effectively does in fact

predict a zero injury outcome. This research was performed for the construction industry by The Construction Industry Institute (CII), Austin, Texas. After visiting, studying, and performing detailed safety analysis of 122 projects utilizing hundreds of contractors the CII researchers surfaced nine major categories of leading indicator leadership techniques that were producing the very best in safety performance, with some results being zero. These are as follows:

1. Demonstrated management safety commitment
2. Staffing for safety
3. Safe Work Planning, pre-project and pre-task
4. Safety Education; orientation and specialized training
5. Employee Involvement, behavior safety and safety perception surveys
6. Evaluation and recognition of safety performance
7. Contractor selection and management
8. Accident/incident investigation Including near misses
9. Drug and alcohol testing

Within these nine major categories are the building block items” that when used in an informed manner have been shown to result in a zero injury outcome for one million hours and more. The “building block items” are predominately of a type one could call “people focused technologies.” The term “technologies” is used to bring a proper focus to these “items.” Each category has within its’ successful implementation details that when closely examined are but socially technical, people focused, safety activities on how to go about a proper implementation of the category. Sometimes these details are to be carried out by line employees, other times by line managers, and sometimes by the safety staff and not a few times by top company leadership.

Zero injury defies the law of probability because we know zero injury is not statistically probable. HOWEVER, if one takes the shorter term view; one where we are trying to work injury free for “this project” then it becomes not only probable but because it is happening so often we cannot but conclude such is definitely “possible.” This simple fact highlights the following:

“The potential of zero injury for the long term not being statistically probable, does not remove the potential of zero injury for the short term being statistically possible!”

So, the questions before most leaders in industry today who are struggling to stop useless injury are simply these; “Are you ready yet?” “Are you ready for a positive change?” “Are you ready to use the research proven Zero Injury Safety Leadership Concept?” “Are you ready to capitalize on the 500% ROI that comes with the successful application of the CII research to your safety program?” “Are you ready to do the right thing about employee injury and learn how others are working millions of hours with Zero Employee BLS/OSHA Recordable Injuries?”

Information on working injury free is available from: www.construction-institute.com or www.naocon.org or simply do an internet search for the two words “zero+injury” to find other sources of information and or assistance.

NAC PP No. 25, June 15, 2012, Leader's Accountability for Safety

Since the advent of safety professionals in the construction industry there have been accountability issues (some recognized and some not recognized) with the question of “Who is in charge of safety?”

The research of the Construction Industry Institute, Austin, Texas has shown that safety excellence includes a top corporate executive charged with the oversight of safety administration; often along with employee health issues, plus some also add to the job role oversight of environmental issues. This paper will only address the safety portion of that role and address it in terms of safety accountability, with the focus on safety accountability extending throughout the organization. All too often employees will simplify the roles of the safety professionals viewing them as all encompassing. All encompassing, to the point that if an issue arises bearing on the subject of safety, then the view of all is, it belongs to the Safety Organization. All encompassing, to the point that if there is an injury the conclusion is; it must be the fault of the safety department.

When this scenario becomes a reality in an organization it is because organizational roles have not been defined or if defined, not defined in accord with the CII research. The CII research spells out the essential fact that when the objective is the elimination of all injuries the resolution of safety related issues should have voice that reports directly to the CEO. Yet the same research also points out that line management must be both responsible and held accountable for the safe execution of all work. These findings when implemented create an organizational “cross-pull.” The Safety Department is “pulling in” responsibility so they can be properly accountable for corporate administration of safety while at the same time the line leaders are told to “pull in” safety responsibility and be accountable for safe work execution. It is easy to see the potential for conflict is such a scenario.

(See NAC PP 25A for a typical Case Study Scenario.)

How does an organization solve this problem? The answer is by simply defining job roles. Defining job roles in the area of employee safety is not an easy thing to do because of tradition. The CII research on how some employers have left tradition behind to create safety cultures where recordable injury is rare to non-existent creates an opportunity to change this tradition.

The zero injury outcome cultures have revealed the proper approach to “Who is in charge of safety?” Simply put, the safety function is to be in charge of safety administration while the line management leaders are to be in charge of safety execution. Taking the time to define the roles accordingly, including role definition to where the crafts also have specific knowledge of their job safety roles, is essential for a smoothly operating zero injury safety culture.

Another need is to always maintain “line accountability” for safety incident reporting with line managers and supervisors. The rule is they “must always” make a report, up the line; even to the point of reporting of near misses. In a zero injury culture the Construction Industry Institute research shows that where zero injury exists safe work execution is led and managed by the

foremen, superintendents and line managers ending at the top of the organizational supervisory ladder. In the case of a serious injury the Certified Safety Professional's (CSP) assistance is properly focused on the care of the injured, the investigation of the incident, matters of safety regulatory compliance, safety standards of practice, safety education, training, coaching, and safety mentoring, along with inspecting and auditing. The CSP is accountable for safety support; line leaders are accountable to supervise an injury free outcome.

Having said the above it must also be clear to all that the able members of the safety profession are critical to implementation of the zero injury best practices that allows the elimination of workplace injury for extended numbers of hours worked. Records of a million hours or more without an OSHA Recordable are now commonplace.

In many ways and many places the safety professionals are the movers and shakers that keep line management's "safety nose" to the grindstone. The safety professionals urge, coach, chastise, plead, beg, reason, inspect, audit, challenge, train, educate, teach; yet as we willingly load all this on their able backs we fail to "properly" engage, thus utilize their hard gotten expertise. We sometimes over-engage them by delegating to them important roles of line management in safety accountability.

Bottom line: Ensure line leaders are responsible to execute all work free of an incident. Should an incident occur in a zero injury culture they hold primary accountability to report these events of failure to the top leader echelons of the company. Through such reporting "responsibility," the line manager "feels" the proper amount of "accountability" for supervising an incident free workplace.

A line manager expected to conduct work injury/incident free, least of all things, will want to be calling the top company leaders to inform them of her/his failure. Such a failure aversion model assures line leaders use all due diligence to apply the full complement of CII zero injury research technology to ensure the elimination of unwanted safety incidences; so the dreaded calls to report failure to the top leader are avoided.

NAC PP No. 25A, June 15, 2012, Line Leaders Accountability for Safety; “The CSP Trap Case Study”

Since the advent of safety professionals in the construction industry there have been accountability issues (some recognized and some not recognized) with the question of “Who is in charge of safety?”

The research of the Construction Industry Institute, Austin, Texas has shown that safety excellence includes a top corporate executive charged with the oversight of safety administration; often along with employee health issues, plus some also add to the job role oversight of environmental issues. This paper will only address the safety portion of that role and address it in terms of safety accountability, with the focus on safety accountability extending throughout the organization. All too often employees will simplify the roles of the safety professionals viewing them as all encompassing. All encompassing, to the point that if an issue arises bearing on the subject of safety, then the view of all is, it belongs to the Safety Organization. All encompassing, to the point that if there is an injury the conclusion is; it must be the fault of the safety department.

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How does an organization solve this problem? The answer is by simply defining job roles. Defining job roles in the area of employee safety is not an easy thing to do because of tradition. The CII research on how some employers have left tradition behind to create safety cultures where recordable injury is rare to non-existent creates an opportunity to change this tradition.

To better understand and avoid the “responsibility – accountability for safety issues” let’s look at a common scenario in the life of a young but growing construction company through a fictional case study. Though the case study is of a young company the issues are just as prevalent in established older companies. Case Study:

As a company or project grows to the size that the hiring of a safety expert becomes a necessity the company does without a Certified Safety Professional (CSP). But at some point along the way the wisdom of assigning a CSP becomes apparent and the talent search is made. One is found and with some fanfare the arrival of “our new Safety Man”

is hailed. Everyone welcomes “their new CSP” and the problem of proper utilization is the ever present result. Too many times in the company office whoever in line management has had the lead role in safety quietly and thankfully steps aside to allow maneuvering room for the new “Safety Man.” This is not all bad, this stepping aside, but it can and often is allowed to go too far.

When the new Safety Man reports for work the issue of “safety accountability,” though of tremendous importance is often not addressed at all. The typical scenario is that everyone relaxes safety leadership and gives way. Issues bordering on the safety subject are now referred to the CSP. All regulatory issues certainly get directed to the CSP and along with this way too much field accountability for safety suddenly gets dropped on the new CSP as well. Thus the “leadership and management of workplace job execution safety” which up until the day the CSP came on board had been in the proper care of line management all too often falters or sometimes falls between the chairs, so to speak.

This can be called the “CSP trap;” and line management willingly, sometimes even eagerly falls into it. This “falling” happens as line managers, long weary of doing it all for themselves and wanting to be cooperative begin to drift away from being “accountable” for workplace safety. This is not saying that managers would immediately abort all effort to supervise a safe workplace; what is being said is line managers may, if not very careful, slowly yield accountability.

Whereas “before CSP” it was their responsibility to report any safety incident up the line to top management, now they depend on the CSP to do the reporting while they continue to see that production is proceeding. These line leaders may even feel some degree of relief that they personally “no longer have to call the top boss” to report an incident, yielding this “totally” to the CSP. Thus, line safety accountability to report is allowed to slide over to the new CSP; and thereby the “trap is sprung!”

Usually no one in top management will recognize this shift, after all the new CSP can do it better, they observe. While this may have a measure of truth, the accountability shift took place the first time leaders allowed this “no longer have to call the ‘top boss’ if my group has an injury,” occurred. With the passage of time, the procedure to let the CSP become the sole reporter of incidences to the top becomes accepted routine. The subliminal reaction of the line leaders can be illustrated by continuing the above scenario.

Let’s say a serious injury occurs. The line supervision calls the CSP immediately and s/he arrives on the scene shortly. Being trained to handle safety emergencies s/he does it well. As soon as s/he gets a free moment s/he places a phone call to the Owner/President/CEO and reports in some detail on the incident. Here we see the accountability issue and it is as follows: if ever the CSP report is allowed to supplant a parallel report by the responsible line manager to the same top management the “trap springs.” Line management safety accountability was sacrificed on the occasion that found the CSP making “the only report” to top management on an incident. (End of Scenario. NAC PP 25 presented previously is published without the CSP Scenario;)

The zero injury outcome cultures have revealed the proper approach to “Who is in charge of safety?” Simply put, the safety function is to be in charge of safety administration while the line management leaders are to be in charge of safety execution. Taking the time to define the roles accordingly, including role definition to where the crafts also have specific knowledge of their job safety roles, is essential for a smoothly operating zero injury safety culture.

Another need is to always maintain “line accountability” for safety incident reporting with line managers and supervisors. The rule is they “must always” make a report, up the line; even to the point of reporting of near misses. In a zero injury culture the Construction Industry Institute research shows that where zero injury exists safe work execution is led and managed by the foremen, superintendents and line managers ending at the top of the organizational supervisory ladder. In the case of a serious injury the Safety Professional’s (CSP) assistance is properly focused on the care of the injured, the investigation of the incident, matters of safety regulatory compliance, safety standards of practice, safety education, training, coaching, and safety mentoring, along with inspecting and auditing. The CSP is accountable for safety support; line leaders are accountable to supervise an injury free outcome.

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In many ways and many places the safety professionals are the movers and shakers that keep line management’s “safety nose” to the grindstone. The safety professionals urge, coach, chastise, plead, beg, reason, inspect, audit, challenge, train, educate, teach; yet as we willingly load all this on their able backs we fail to “properly” engage, thus utilize their hard gotten expertise. We sometimes over-engage them by delegating to them important roles of line management in safety accountability.

Bottom line: Ensure line leaders are responsible to execute all work free of an incident. Should an incident occur in a zero injury culture they hold primary accountability to report these events of failure to the top leader echelons of the company. Through such reporting “responsibility,” the line manager “feels” the proper amount of “accountability” for supervising an incident free workplace.

A line manager expected to conduct work injury/incident free, least of all things, will want to be calling the top company leaders to inform them of her/his failure. Such a failure aversion model assures line leaders use all due diligence to apply the full complement of CII zero injury research technology to ensure the elimination of unwanted safety incidences; so the dreaded calls to report failure to the top leader are avoided.

NAC PP No. 26, February 15, 2013, How might the Chief Executive Avoid At-Risk Behavior in Corporate Safety?

Is it fair to call out the failure of a Chief Executive Officer (CEO) to lead safety in their organization as “at-risk behavior?” If fair, under what circumstance might we be justified in doing so?

Consider the definition of “at-risk behavior.” In this case “at-risk behavior” is defined as the absence of “active involvement” by the CEO in setting and maintaining oversight of employee safety policy and process. Another question may be raised here and that is; “If a company’s worker hazard exposure is so low as to be viewed as insignificant does that fact nonetheless still require a CEO to function in a corporate safety oversight role?” To the latter question, the answer would be “Yes” because the CEO is customarily recognized, in some states by statute, as the position that is responsible and accountable for all corporate happenings, whether it be a “record year” for company profit or the “loss of profit” caused by the injury to an employee while at work. If we introduce “executive morals” then it remains clear that the CEO is not only responsible and accountable in a fiduciary sense for monetary loss flowing from an injury but also in a moral sense for the suffering of an on-the-job injured employee.

On the subject of executive morals, many companies state they hold “honesty and integrity” as corporate values with some going so far as to include “safety” as a corporate value. Who in the governance of a corporation is the ultimate accountable party for performance that models “honesty and integrity?” If in the above proposition the answer is the “Top Executive” then the same affirmative answer must logically apply to the moral aspects of the occurrence of an employee injury.

With the above logic so stated, then the answer to the **title question** is; “By being actively involved in oversight of corporate safety policy and adoption of safe work processes.”

Within the USA construction industry during the last 22 years, employee injury rates have dropped dramatically. For instance, the OSHA recordable injuries decreased from 14.3 per 100 workers per year in 1989 to 3.9 in 2011, a 73% reduction in frequency. This is a laudable improvement of safety performance over the 22-year period. Astonishingly and even more amazing has been the improvement logged by members of the Construction Industry Institute, (CII) Austin, TX. These companies are now performing at a mere 0.43 frequency rate (a 97% reduction over the 1989 BLS national average of OSHA recordable injuries per 100 workers per year). Some of these CII firms have achieved in excess of one million hours without an OSHA recordable injury. If we term the 2011 industry average of 3.9 as a laudable achievement, then what adjective can we use for the 0.43 OSHA recordable frequency by CII members in 2011?

Rather than attempting to answer this question with a more appropriate adjective, a better question is “How did they do that?”

This answer to “how” is found in the safety research of CII. The multiple Safety Research Task Forces of CII over the last 25 years found that if the Top Leaders of construction contractor companies used a simple battery of nine measurable safety interventions, then they too will find

their projects largely injury free. Interestingly the first of these interventions is “Demonstrated Management Safety Commitment.” See list below. A similar set of guidelines was found by which owner companies could have a significant and positive influence on safety performance.

This “injury free” safety performance phenomenon has been labeled “The Zero Injury Safety Leadership Concept” by many users of the multiple instructional products published by the CII safety research task forces.

Common questions of those whose interest is peaked by the above data is “How much does it cost to effectively adopt the CII research-based findings? Will such a move be cost effective?”

The cost answer is yes, investment must be made but the good news in ROI terms is even more amazing than the safety performance improvement itself. In ROI terms the answer is often reported as being 500%. Testimony from all those Top Corporate Leaders who share in this safety record is as follows: “Our projects which finish without injury are always our most profitable!” Reviewing the list of CII companies with world class safety performances reveals that these are also among the most respected leaders in the competitive construction market. Safety is good business. Safety pays off!

The purpose of the National Academy of Construction Position Position Papers on Safety is to inform all corporate leaders of the humane and profitable benefit of the advance in safety performance in the construction industry. In the last decade companies in all sectors of private enterprise have found safety success using the employee safety findings of the Construction Industry Institute zero injury research.

NAC PP No. 27, August 1, 2013, Taking “Safety as a Core Value” from a Corporate Statement to an Employee Commitment

For a decade or more, Corporate Mission Statements of those companies engaged in construction have often contained the statement that “Safety is a Core Value.” To many in the Construction Industry this term means that “zero harm to the public, the employees the equipment, tools and facilities” is one of the valued outcomes of successful construction projects.

Yet today, the corporate term “Core Value” is largely undefined as far as the employee is concerned. This is a vital issue because for a Corporate Core Value to be fully realized it must be wholly integrated as a matter of course into the job duties of every employee. In the safety arena, only when each employee personally applies “safety as a core value” to their work processes can there be the successful creation of a “Corporate Safety Core Value.”

Construction leaders assert that corporate success in establishing “Safety as a Core Value” is exceedingly difficult. The principal barrier stems from the persistent presence of “at-risk” behavior within the workforce and this “at-risk” behavior is found in leaders and workers alike. Root Cause analyses of safety accidents conclusively reveal that changing and preventing employee at-risk behavior throughout the organization is the secret to a zero harm outcome.

Also another barrier may be the lack of a common definition of the word Value. When one looks to the Webster Dictionary for a definition, it quickly becomes apparent that the general meaning of the word is non-specific ranging from “monetary” to “societal ethical behavior.” Exploring the latter we quickly see that “human safety as a value” fits easily into the “ethics” category because there is nothing more important than the health and safety of employees and the public both in and outside the construction workplace.

Therefore, it would be unethical for a construction leader to ignore any proven intervention that effectively engages the employee in avoiding at-risk behavior. To this end, NAC points out that making the statement that “Safety is a Core Value” is merely the beginning. To become operative in the workplace the statement must be followed-up by formally defining the term and inviting all employees to embrace a corporately published definition.

NAC offers the following model employee “buy-in” statement that asks for at-risk behavior avoidance and allows each employee to formally embrace the meaning and spirit of the worthy ideal by making Safety a personal “Core Value.” With this commitment base, it is then a Corporate Core Value of Safety can be fully realized.

By accepting the following statement, I personally embrace “Safety as a Core Value” as described herein.

Corporate Objective: “Safety is a Core Value”:

This objective can only be realized when we as individual employees are successful in avoiding all at-risk behavior while living and working safely. It is after we have personalized “Safety as a Core Value” that “Working safe” will be what we do; such will describe and define us, reflecting a Commitment to Safety so imbedded in our personal guiding principles that we as employees cannot, except by force of personal will, act otherwise.

When all have subscribed to this stated thesis we as a company will achieve “Safety as a Core Value” in the manner intended.

Personal:

I accept that “Safety as a Core VALUE” as described above defines my personal belief system thus is a guiding principle in my life and work.

Signed: _____ Data _____

Think about it.

NAC PP No. 28, February 10, 2014, Finding Success in Near-Miss Reporting

Faithful employee reporting and leader investigation of all injuries and near-misses was found as an essential safety learning precursor to zero injury outcomes in the use of the Zero Injury research of the Construction Industry Institute, (CII) Austin, TX. While most projects studied in the CII research were logging near-misses, many were not adequately providing near-miss reporting and investigation information to the employees in a manner that promoted the reports requested.

The CII research found the safest projects had the most near-misses reported! The “why” of this relationship is explained by the following logic. Experience has shown when near-misses are being effectively reported on a project it is because the leadership have created a non-threatening near-miss reporting environment. Workers on the alert for a near-miss to report are focused on doing their work in a safe risk-free manner. Feedback from the investigations encourages more near-miss reports.

The CII research cited three requirements that “set the stage” for effective near-miss reporting and investigations. These are:

1. The project maintains an effective near-miss reporting process.
2. A formal documented system exists to report near-misses.
 - i. Defines a near-miss in simple terms.
 - ii. Reporting paperwork is not oppressive.
3. Workers are encouraged to report near-misses.
 - i. Reports are openly welcomed.
 - ii. Recognition provided to workers.
 - iii. Workers receive feedback on investigation outcomes.

While a majority of construction leaders and workers realize the importance of near-miss reporting, CII research has shown that most projects are not successful in achieving effective near-miss reporting, investigation and feedback.

The question is “Why?” NAC shares the following insight for consideration, while the occurrence of a near-miss is an “unwanted” event; the reporting of a near-miss is a “wanted” event. It is in the managing of this conflict that success can be found. If the first reaction of a leader when a near-miss is reported is a response of “What? Not again!” followed by obvious anguish even to the point of demonstrated anger, then near-miss reports will be stifled. This scenario is severely aggravated in the case where the preceding expressions are seen/heard by the reporting employee. In these circumstances one can be sure that few to no additional near-miss reports will be forthcoming from that individual. Soon the “word gets around” and most near-misses go unreported especially those from the crafts.

The answer to near-miss “report receiving” success lies in Behavior Based Safety. Training must be provided to all employees, CEO to the foremen and superintendents who receive near-miss reports to “always” respond (Behave) positively when made aware of a near-miss. “Always” compliment the reporting individual in an earnest and sincere manner; then depend on the

sharing of the investigation details to teach all employees that once again a lesson has been learned that can be used to protect all from similar future unwanted events.

NAC PP No. 29, May 1, 2014, OSHA's National Safety Stand-Down to Prevent Falls in Construction

The National Academy of Construction (NAC) supports the OSHA Fall Prevention Safety Stand-Down scheduled for June 2-6, 2014. Falls in construction accounted for 269 lives out of 775 lost in 2012, or 35% of all fatalities. This OSHA effort grows from the fact that fall prevention standards were among the top 10 most frequently cited OSHA violations during fiscal year 2012. In support of a safer industry, NAC offers, at no charge, our Safety Position Paper series to all Participants to support the Safety Stand-Down.

OSHA details the stand-down here:

<https://www.osha.gov/StopFallsStandDown/index.html#certificate> The NAC excerpts it below for the convenience of the reader.

What is a Safety Stand-Down?

A Safety Stand-Down is a voluntary event for employers to talk directly to employees about "Fall Hazards" and to reinforce the importance of "Fall Prevention."

How to Conduct a Safety Stand-Down

Construction companies conduct a Safety Stand-Down by stopping work and providing a focused toolbox talk on a safety topic such as ladder safety, fall protection equipment, or scaffolds safety. The meeting provides information to workers about hazards, protective methods, and the company's safety policies, goals and expectations. Managers are encouraged to plan a stand-down that works best for their workplace anytime during the week of June 2-6, 2014. The goal is to have over 25,000 employers and 500,000 workers to hold a Stand-Down and if we meet this goal, we will have touched almost 1 out of 10 construction workers in the country.

Who Can Participate?

Participants may include trade associations, employers, federal, state and local governmental agencies, professional societies, institutes, and consumer/labor-management interest organizations, sub-and independent contractors.

Partners

OSHA is partnering with key groups to assist with this effort, including the National Institute for Occupational Safety and Health (NIOSH), OSHA approved State Plans, State consultation programs, the Center for Construction Research and Training (CPWR), the American Society of Safety Engineers (ASSE), the National Safety Council, and the OSHA Training Institute (OTI) Education Centers.

Certificate of Participation

This Certificate page will be active on June 2nd on the above OSHA web site. Employers will be able to provide feedback and download Certificates of Participation on their experience June 2 to July 15, 2014 following their stand-down.

NAC PP No. 30, April 20, 2014, North American Occupational Safety and Health Week - May 4 – 10, 2014

The National Academy of Construction (NAC) urges the construction industry to support the North American Occupational Safety and Health week May 4 - 10.

In cooperation with the above, the “Construction Industry Safety Initiative” (CISI) is encouraging participation of their 31 major contractor members to conduct a Safety Emphasis Week May 4 – 10. More information on the CISI effort may be found on the web site: <http://safetyweek2014.com/why-safety-week>.

The National Academy of Construction offers our Safety Position Paper series to assist contractors and owners engaged in the construction industry. The series content is based on the Construction Industry Institute’s (CII) 20 years of research into how some contractors can work OSHA Recordable injury free while many cannot. Six CII Research Task Forces examined 122 major construction projects using leading indicators. The typical NAC Safety Position paper explains a critical leading indicator that will assist in your safety leadership as you plan and support the above two May 4-10, 2014, initiatives.

On the occasion of North American Safety Week - 2014, the National Academy of Construction asks all industry leaders to consider and to support the thinking that a “Committed” safety effort is a humanitarian and a business investment in your management team, your workforce and, as the member companies of CII have found, in the ultimate superior financial performance of your firm.

NAC PP No. 31, June 16, 2014, LFHIIs: Low Frequency High Impact Incidents

The National Academy of Construction is mounting a safety initiative to inform and caution industry leaders of a historical safety trend that even the best safety-performing companies are vulnerable to low frequency high impact incidences (LFHIIs). NAC realizes that the circumstances surrounding low frequency incidents can vary greatly, but feels if a fatality occurs, then the incident must be classified as an LFHII.

From 2006 the construction industry experienced six consecutive years of declining fatalities until 2012. Then, according to data from OSHA, construction fatalities in the private sector rose from 738 in 2011 to 775 in 2012, an increase of five percent. This occurred while total hours worked increased by only one percent during the same period.

Also, of concern is despite significant progress in reducing construction employee injuries, the industry's fatality rate has not improved at the same rate. From 1989 to 2012, the OSHA Total Recordable Incident Rate (TRIR) per 100 employees improved from 14.3 to 3.6, or almost 75 percent. In comparison, however, fatalities improved by a lesser 42 percent, (16.4 to 9.9 per 100,000) a 33 percent differential. This raises the questions of "Why?" and "Are there leading indicators that can be used to prevent LFHIIs?"

This Safety Position Paper is NAC's first step in alerting construction industry leaders of this major safety performance anomaly. NAC would also like to inform industry leaders that the Construction Industry Institute (CII), Austin, TX has recently initiated an LFHII research project to examine the LFHII type event and seek answers to two questions:

1. Are there precursors or leading indicators of low frequency high impact events?
2. If so, what are they and how can they be identified, analyzed, and utilized?

Going forward, as a part of NAC's Safety Position Paper series, we will issue additional Position Papers on this subject to highlight the industry's vulnerability to LFHIIs and seek to inform the industry of potential causative factors.

NAC PP No. 32, February 1, 2015, “The Two Faces of “Caring””

NAC position papers have highlighted outcomes of zero injury with the CII research revealing how these remarkable outcomes can be achieved. Success is dependent on the use of leading indicators and the manner in which employee “buy-in and co-ownership” is actively sought and won. A primary secret to success is found in the culture leaders create and nurture when they actively demonstrate a “caring” attitude toward the total well-being of the employees, especially the craft personnel. Traditionally leaders have demonstrated their caring with a focus on the use of threatening demands that there be no employee safety rule violations.

The leader might say: “Since I do not want to see anyone injured on this project, I am hereby issuing a warning to ‘always’ comply with this safety rule. If you are caught violating this rule you will be summarily terminated. You realize, of course, we do this for your own good since we do not want to see you injured.”

This leader approach can be termed the “Safety by Termination on First Offense Mode,” using fear as the motivator. This is “Face 1 Caring,” in which the leader is focused on the health of the employee, but not necessarily on the longer term total well-being of the employee.

The “one violation and you are out mode” leaders will keep certain individuals free from injury, however, the net effect of this type summary termination has an overall negative effect on many of the remaining employees. Face 1 “threats to punish” serves to alienate these employees and creates divisive relationships known to stifle zero-injury outcomes. This is summarized by saying: “You cannot punish your way to a zero-injury outcome!”

With the second face of caring, Face 2, the leader is not only truly concerned about the physical wellness of employees, but also exhibits “caring” for the general well-being of the employee and his/her family unit. Those successful in building a zero-injury safety culture do so by adding to the “caring for life and limb,” a second level of caring that extends deeper and recognizes two role-model aspects of an employee’s life at work and at home.

1. A Positive Workplace Peer Role Model – A remorseful offending employee can benefit from retraining on how a safety culture benefits all employees by everyone’s adhering to sound safety practices.
2. A Positive Family Role Model – This approach appeals to the employee to consider his/her family in exhibiting a cooperative spirit in a safety culture where all support all. This recognizes that employees need jobs to support their families, and thus in reality a fully caring leader does not hasten to terminate anyone.

In order to preserve these two role models, successful “caring” Face 2 leaders put the employee in a retraining program for safety rule adherence and thus avoid the negative effects of Face 1 caring. Even so, it is recognized some very successful safety employers use termination for a first violation of what is termed “cardinal rules.” The logic is that such at-risk behavior that may

result in death cannot be tolerated or a fatality will occur. To mitigate and offset the negative effect, they embrace the Face 2 mode by immediately offering to rehire the employee on the condition that the employee agrees to a safety retraining curriculum. These employers feel the “shock effect of the termination step” rather than the “straight-to-training” method is beneficial in preventing cardinal rule violations. Second-time violators are not afforded this leniency.

“Face 2” is “merciful leadership” and, when used appropriately, serves to win the hearts and minds of all employees to be role models in avoiding all at-risk behavior.

NAC PP No. 33, March 16, 2015, Are Some Contractors Stuck in a Mid-80s' Standard for Safety Performance?

How Zero Lost Time Injury Rate (LTIR) became the Construction Industry Performance Standard

When the Business Roundtable Construction Committee reviewed applications in 1987 for its safety excellence awards, two submissions were remarkable. Winway, Inc., a scaffolding and insulation contractor in Freeport, TX, had reported a record 4.5 million work-hours free of lost-time injuries. Air Products, the gas liquid manufacturer headquartered in Allentown, PA, had reported two million LTIR-free hours by their facilities' construction contractors. During their combined 6.5 million hours worked they achieved an LTIR of 0.00.

The nominal LTIR for construction in 1984-86 was near 6.8, making the Winway and Air Products results an amazing achievements for the time. Together, they had avoided more than 225 lost-time injuries. A new standard of excellence, Zero LTIR, had been set. The obvious question was: "How did they do that?"

In 1990, the Construction Industry Institute began an extensive study of LTI free projects by establishing its Zero Accidents Research Team. Initial research findings were published in 1993. By 2003, additional research revealed that through use of the research CII members had improved from an LTIR of 1.9 in 1989 to 0.46 by 2003.

Why Zero Total Recordable Incident (TRIR) Is the New Standard of Construction Safety

Excellence

From 1989 through 2003, four organizations recorded one million hours at zero OSHA Recordables: H.B. Zachry for 1,020,000 (1989) for Shell Oil; Fluor for 2,080,000 for Conoco Phillips (1996); NPS Energy Services for over one million hours (1999) at the Peach Bottom Nuclear Power Plant; and Parsons for 1,229,585 for Exxon (2002).

CII reported in 2003 on research in three additional areas: Safety Plus, Making Zero Accidents a Reality; The Owner's Role; and Shutdowns, Turnarounds, and Outages. Once CII members began applying this latest research, increasing reports of zero recordables were submitted. By 2015, 32 companies had reported a total of 92 occasions where projects had logged zero recordable injuries exceeding one million hours or more. With these accomplishments, clearly the new standard of excellence for safety has moved to Zero TRIR.

It is on the basis of this performance that NAC invited the many contractors who continue to use the 1980s standard of 0.0 LTIR as their goal to embrace the new standard of safety excellence: Zero TRIR. Remaining at Zero LTIR as a goal ignores both restricted duty and job transfer injury incidents, which make up 0.70 of the National Average DART (Days Away + Restricted Duty + Job Transfer) case rate of 2.2 in 2013. With the humane objective of further reducing suffering from injuries and fatalities, a vast difference exists between Zero Lost Time Injuries versus Zero Recordable Injury. Zero LTI can no longer be termed Excellent!

The CII research clearly shows the path to follow and the steps to take. Amazing things happen as employers and employees commit to zero at-risk action/inaction behavior to achieve zero recordable injury outcomes.

NAC PP No. 34, March 16, 2015, OSHA's Annual National Safety Stand-Down to Prevent Falls

The National Academy of Construction (NAC) supports the OSHA Fall Prevention Safety Stand-Down scheduled for May 4-15, 2015. Resources can be found at:

<https://www.osha.gov/StopFallsStandDown/resources.html>

Falls in construction accounted for 294 lives out of 796 lost in 2013. This OSHA effort grows from the fact that fall prevention standards were among the top 10 most frequently cited OSHA violations during fiscal year 2013.

What is a Safety Stand-Down?

A Safety Stand-Down is a voluntary event to allow employers to talk directly to employees about fall hazards and to reinforce the importance of "Fall Prevention."

How to Conduct a Safety Stand-Down

Construction companies conduct a Safety Stand-Down by stopping work and providing a focused toolbox talk on a safety topic such as ladder safety, fall protection equipment, or scaffolds safety. The meeting provides information to workers about hazards, protective methods, and a company's safety policies, goals, and expectations. Managers are encouraged to plan a stand-down that works best for their workplace anytime during May 4-15, 2015.

OSHA Fatality Statistics are available at:

<https://www.osha.gov/oshstats/commonstats.html>

NAC PP No. 35, December 1, 2015, Integrity in Classifying OSHA Recordable Injuries Crucial to Achieving Zero Injury Outcomes

The safety results achieved through using “the zero recordable injury leadership concept” approach are almost nine times (0.42 TRIR) better than the U.S. average (3.6 TRIR*) in 2014. Construction Industry Institute (CII) members applying the zero injury techniques for 20 years is resulting in much greater numbers of hours worked being documented between recordable injuries.

To illustrate and quantify the effectiveness of implementing the zero injury techniques, NAC offers the following: In 2014, the U.S. average hours (calculated from BLS data) worked in construction between BLS/OSHA recordable injuries was 55,555 hours (200,000 / 3.6). Those contractors using the CII zero injury research worked 3.2 billion hours in 2014 averaging 476,190 hours (200,000 / 0.42) between recordable injuries or 8.6 times better than the U.S. average. This performance by CII member companies reduced employee suffering by 50,000+ recordable injuries.

The CII research, based on examining 122 construction projects, identifies nine major categories of safety leadership found to be essential for success in generating zero injury outcomes. Those are:

1. Demonstrated Management Safety Commitment
2. Staffing for Safety
3. Safe Work Planning — Pre-Project and Pre-Task
4. Safety Education, Orientation, and Specialized Training
5. Employee Involvement, Behavior Safety, and Safety Perception Surveys
6. Evaluation and Recognition of Safety Performance
7. Contractor Selection and Management
8. Accident/Incident Investigation — Including Near-Misses
9. Drug and Alcohol Testing

With the above convincing results the zero injury approach is becoming more widely accepted by construction owners and contractors, both domestically and internationally. The National Academy of Construction is actively advocating the use the nine major categories of safety leadership cited above and the over 200 techniques found in the research document.

Caution: Use Integrity in Classifying Injuries

Construction safety performance continues to improve in the U.S. From 2005-2014, the BLS Total Recordable Injury Rate (TRIR) in construction improved from 6.3 to 3.6. During this same time period to the present, construction owners have increased pressure on contractors to perform at an outcome of 1.0 recordable injury frequency or less. In too many instances, that pressure from owners has led some to succumb to the temptation to misclassify a less serious recordable injury as a non-recordable.

Despite being obvious, NAC lists the following five reasons to avoid the temptation to misclassify a recordable injury (as defined by OSHA) as a non-recordable:

- Reason 1. – The moral and legal aspects of breaking OSHA law
- Reason 2. – Being thought of by employees as dishonest
- Reason 3. – Undermines efforts to create a trusting safety culture
- Reason 4. – If caught by OSHA, publicly labeled as an unsafe employer
- Reason 5. – Removal from potential client-approved bidder lists

Zero injury outcomes not only reduce the costs of injury, but increase overall project productivity as workers gain confidence that their employer is sincerely dedicated to their overall well-being. All owners and contractors should recognize that demonstrated integrity in all safety matters is an essential ingredient in the number one safety leadership category: “Demonstrated Management Safety Commitment.”

*100 workers per year = 200,000 hours. Divide 200,000 by TRIR to get average hours between injuries.

Emmitt J. Nelson, PE, Principal Author, Member NAC Safety Committee

NAC PP No. 36, January 12, 2018, To Improve Safety, Improve Project Definition

Can improving construction safety be as simple as improving project definition at the early stages of the project lifecycle? Capital projects that are well prepared at the front-end have better construction safety results. Project teams, including the business sponsors, should focus on the application of best practices during front-end planning—the project definition phase. Proper project definition not only drives better project cost and schedule results but improves construction safety. That is, project safety performance and project outcomes go together because *all* aspects of a project benefit from good planning and excellent execution.

The injury rate in construction is higher compared to many other industry sectors. In 2015, 937 workers in the U.S. construction industry died from work-related injuries and illnesses. Approximately 116,000 more suffered a DART injury case.¹ The U.S. construction industry had a recordable incident rate of 3.5 per 200,000 hours and a DART² incident rate of 2.0 per 200,000 hours.³ Given the size of the construction industry, these rates represent extremely high numbers of injured workers. And despite the overall trend showing improvement in the industry, that improvement unfortunately is primarily in the less severe categories of injuries or illnesses. In fact, the industry's fatality and DART incident rates have shown little improvement over the last several years.

Best Practice Number One: Project Definition

What can be done? The single best practice with the most leverage is achieving the appropriate level of project definition during the early development phase of a project, especially before starting project execution. Better levels of project definition prior to project authorization and the start of detailed engineering are strongly correlated with better safety performance during the construction phase.

One element in particular lead to better safety: **a formal, documented, and approved project execution plan**. Such a plan will outline a project execution strategy as well as specify team staffing and a master project schedule. The plan also will include environmental, health, and safety (EH&S) plans and construction safety plans.

In addition to the formal and approved project execution plan, a well-defined project will contain **a complete basic engineering package** that includes issued-for-design (IFD) piping and instrumentation diagrams (P&IDs) for the entire project scope, health, and safety (Hazardous Operations (HAZOP)) reviews on the IFD P&IDs, and a bottom-up cost estimate that serves as a cold-eye check that all the deliverables required are complete. Importantly, this engineering package should be reviewed by the operations and maintenance staff.

¹ Bureau of Labor Statistics, Fatal Occupational Injuries by Industry and Event or Exposure, All United States, 2015.

² DART (days away, restricted, or transferred)

³ Bureau of Labor Statistics, Employer-Reported Workplace Injuries and Illnesses – 2015, USDL-16-2056, 27 October, 2016.

Other Best Practices

Another best practice correlated with better safety results is **forming an integrated project team to manage the project definition phase**. Projects developed by teams that include all key functional representation have better safety results in the construction phase. Integrated teams are teams that include active representation from the functional groups associated with a capital project: business, operations and maintenance, EH&S, procurement, engineering and design, and construction management. Too often, the project teams that lead the definition phase of capital projects lack representation from one or more of these areas. The result is often late input, which in turn could lead to changes in scope, in design, in cost and schedule targets, or even in overall project objectives.

Also, projects that **plan and implement a robust project controls program** have better construction safety results. A comprehensive project controls program includes several important practices. The project cost estimate should be developed to a level of detail that makes it possible to function as a basis for project cost controls during execution. The cost estimate should be validated using an objective basis for comparison with actual industry performance to ensure that the targets are competitive yet not unachievable. The project team must include a project controls professional during both the project definition phase and the execution phase. During execution, project progress must be measured using physical progressing of actual deliverables and not based on estimated percent complete, hours spent, or costs incurred. Finally, a comprehensive project controls program includes a process for archiving project cost and schedule results for use in future projects.

Apply Best Practices

Best practices during the front-end that drive improved project cost and schedule outcomes will mean better construction safety performance. Projects developed by fully integrated project teams that achieve the appropriate level of definition prior to authorization are less likely to have disruptive late changes, excessive cost growth or schedule slip, or major turnover in team members. A project that is fully defined and is then executed under control simply is less likely to have serious safety problems once in the field.

Too many construction workers suffer work related injuries or illnesses on the job site. Project owners, contractors, and teams should strive to apply well-established project definition best practices not only because it will mean better safety results, but because applying those best practices will result in better cost and schedule performance.

What's Next?

This is the first in a series of NAC position papers linking better safety outcomes to best practices in project delivery. The next paper will address best practices in execution that help drive better safety results. The third paper will look into lessons learned programs that help organizations improve safety performance on future projects. The final paper will discuss organizational leadership practices that support the safety culture.

NAC Position Paper authored by Andrew Griffith, Director - IPA Institute, Independent Project Analysis, Inc., and provided by the NAC Safety Committee.

NAC PP No. 37, January 17, 2017, A Brief History of the Construction Industry Institute Research on Zero Accidents

The year 2017 will mark the 30th anniversary of the advent of *Zero Employee Injury Safety Leadership Concept* in the construction industry in North America. The following gives the history as recorded by individuals involved at the time.

It was in 1987 that The Business Roundtable Construction Committee made the first Construction Industry Safety Excellence awards. The two awardees, an owner and a contractor, had performed their work (6.5 million hours total during 1982-1986) without Lost Workday cases for two years and four years respectively. These amazing achievements for that time were soon labeled the “Zero Injury” phenomenon borrowing from author Philip Crosby’s book, “Zero Defects,” a 14 step approach to quality control.

The significance of this zero lost workday case performance was most startling when compared to the OSHA National Averages for worker injury in construction in the year 1986 of 6.8 lost workday cases per 100 workers. Applying the BLS OSHA national average these two avoided 231 serious injuries to their workers. This was an amazing achievement for that day and time. When these achievements were announced by the Business Roundtable Construction Committee many asked, “How do they do that?”

Soon after, the *Construction Industry Institute* (CII), located in Austin, Texas, and led by Dr. Richard L. Tucker, agreed to commission a research Task Force to look into the question of “How do some contractors and owners achieve millions of hours worked in construction without serious injury?”

CII formed the *Zero Accident Research Taskforce* in the fall of 1989 to perform the research. The work was completed in 1993 when the Task Force published five “How to” products summarized in CII report 163 “Zero Injury Techniques.” CII members began using the five research products and soon found frequent occasions when the safety outcomes extended to record numbers of hours worked with an even more amazing zero OSHA recordable injuries. One contractor reported two million hours OSHA recordable free in 1996.

As a consequence, in 1998 CII investigated these “Zero Recordable” achievements; The “Making Zero Accidents a Reality” Task Force reported out in 2001 and 2002. This research verified and expanded on the 1993 results highlighting additional quantifiable Leading Indicator data that yielded significant safety performance improvements in CII member companies. Many of these including two NAC represented companies that have achieved records exceeding four million hours recordable injury free.

Reviewing the CII member safety data one can see the amazing performance improvement. These companies in 2015 posted a 0.38 Total Recordable Injury Rate (TRIR) versus the private construction industry at large posted a 3.5 TRIR. Other CII research reveals that there is a nearly a 10% cost advantage for combined owner/contractor construction teams who use the CII research.

**NAC PP No. 38, March, 2017, Users of CII Zero Accident Research
are Achieving an 80+% Reduction in Construction Fatalities versus
the BLS Average**

The owner and contractor members of the Construction Industry Institute (CII), Austin, TX using the CII zero accident research published materials to improve their safety programs are realizing amazing safety performance. These companies are operating 80+ percent improved over the BLS industry averages for the BLS NAICS Code 23-Construction. CII has maintained their annually updated safety performance data base of owner and contractor member companies since 1989. The claim above is illustrated in this paper by using the three year BS averages for the period 2013-2015. There were 9.25 billion hours reported (national and international) to CII during this period. These hours represent an average of 1.583 million employees per workday.

The CII members reduced fatalities vs BLS 81.3%. Recordable injuries were reduced by 89.2%. The following table displays their amazing performance.

	Fatalities per 100,000 employees
3 Year.	2013-2015 Averages
9.87	BLS Avg Fatality Rate*
1.85	CI Avg. Fatality Rate**
89	CII Total Fatalities
9.25	CII billion hours reported
81.3%	CII Rate % improved vs BLS Rate
	Total Recordable IR per 100
3.63	BLS TRIR 3 Year Avg. *
0.39	CII TRIR per 100 employees**
9.25	CII billion Hours worked
89.2%	CII Rate % improved vs BLS Rate
	* Simple 3 Yr. Avg. [**Wgtd. Avg]

According to USA BLS data there were 937 construction fatalities in 2015. Eighty one point three percent of 937 is 760. An apparent question is “Can the industry be effectively informed of these facts so that broad action can be taken to preserve the lives and family units of 760 workers?” It is the commitment of NAC to publicize this information so all users can be informed. Owner, contractor and union construction leaders can no longer say; “We do not know how to prevent more fatalities” when in fact the CII information is in the public news domain. It is clear that the CII Zero Accident research contains successful answers to reducing construction injuries and fatalities by the above margins and at a profit.

Yes, the CII research found that the recommended leading indicator techniques when implemented correctly will be cost free even for the smallest of contractors. The research proves when zero injury is implemented in the manner advocated the cost is more than offset by improved production, thus users actually improve profit margins.

The zero injury techniques are discussed in other Position Papers.

NAC PP No. 39, February 19, 2018, NAC Analysis: “Precursors of High Impact, Low Frequency Events, Including Fatalities”

NAC endorses the work of Construction Industry Institute (CII) Research Team (RT) - 321, which lists 16 “Precursors of High Impact, Low Frequency Events (HILFE), Including Fatalities,” as sound, insightful, and provocative. Sound because it explores the bedrock-potential root causes of such events. Insightful in that it gives views of those human actions and inactions that can easily become the root cause of an unwanted event. Provocative because the research stimulates thought on what preventative actions those involved can take.

CII’s RT-321 research defines an “event precursor” as a specific condition that, if left unattended, shows an historic tendency to be a foreteller of an LFHIE. The RT-321 researchers studying LFHIE identified and arranged 16 LFHI event precursors into four categories (listed below). Categories 1 and 4 are weighted in seriousness as x1.0, while categories 2 and 3 are weighed as x2.0, or twice as serious.

Each of these precursors can be mitigated with specifically planned intervention strategies. For instance, in all four categories preventative measures found in previously conducted CII safety research can be applied to effectively mitigate the likelihood of an LFHIE occurring. Since 2006, NAC has published some 40 Safety Position Papers (PP), 35 of which address means and methods that can be used to effectively mitigate the at-risk behaviors that have been found by CII to be the root cause of an LFHIE.

Following the CII precursor categories below, specific NAC Safety Position Papers are noted that can be applied in mitigation.

CII RT-321 LFHI Event Precursors by Category

1. **Pre-Work Planning** - (see NAC PPs 6, 7, 16, and 36)
 - Crew members are unaware of work procedures.
 - No/poor plan to address work changes.
 - No/poor pre-task plan or discussion specific to the work.
2. **Productivity Safety Stressors (x2.0)** - (NAC PPs 7 and 18)
 - Significant overtime
 - Fatigue
 - Schedule/productivity pressure
 - Poor prior safety performance
 - Crew members are not active in safety.
3. **Vulnerability to High Energy (x2.0)** – (NAC PPs 3 and 4)
 - Lack of control over barrier and/or visual warning
 - Line of fire is uncontrolled.
 - Improvisation

4. Outside Safety Influences - (NAC PPs 5, 7, 8, 9, 15, 21, and 25)
 - Limited safety supervision
 - Poor quality or inexperienced foremen
 - Distracted workers
 - Working alone
 - Congested workplace/crowding

The National Academy of Construction's recent study of LFHIE shows consistency with the CII findings in the RT-321 report.

NAC PP No. 40, September 26, 2017, The Foundational Logic of Zero Injury

The National Academy of Construction (NAC) urges top company leaders in the construction industry to embrace the operational concept of “achieving Zero Injury” as a corporate safety performance norm. NAC offers the following safety precepts on which the Zero Injury safety concept is based. These statements give insight into how to begin the process that yields in Zero Injury outcomes. NAC fully recognizes that Zero Injury is a safety concept that departs from the historic norm of accepting employee injury as a necessary part of the build process. This paper defines a "precept" as *a foundational logic statement supporting a corporate safety commitment by all employees to work injury free*. A precept typically takes the form of a statement but can also be a poignant question. The Zero Injury precepts assist individuals in forming their foundational safety beliefs. A priority list of the NAC Zero Injury precepts asks top leaders to:

1. Know that the fact injuries occur does not mean that injuries must occur; all injuries are preventable.
2. View the objective of Zero Injury outcome as a commitment, not a target or goal. There is a difference.
3. Understand there are many reasons injuries occur, but only one cause, which is always linked to some form of at-risk behavior (ARB).
4. Ensure all employees make a commitment to avoid all at-risk behaviors.
5. Accept that committing to Zero Injury is not saying there will never be another injury, but that another injury is never wanted.
6. Know employees will fully support a company’s Zero Injury efforts since no employee nor their families want an injury to occur to anyone.
7. Acknowledge that safety has always been about working more hours without injury. It is clear that Zero Injury is statistically possible.
8. Recognize that an informed construction leader’s job is simply to apply the Zero Injury research of the Construction Industry Institute (CII) to redefine a company’s longest string of hours worked at Zero Injury.
9. If Zero Injury is not your heart’s desire for a safety outcome, then what is?

The longest string Zero Injury records occurring in North America, both exceeding more than 4.6 million hours worked, have been achieved by S&B Engineers and Constructors, Houston, TX, with a companywide record, and by Peter Kiewit Sons’, Inc., Omaha, NE, at the Kearl Oil Sands Project near Fort McMurray, Alberta, Canada. CEOs of both companies are members of NAC.

NAC PP No. 41, November 27, 2017, The CEO's Role in Safety Is Key to Achieving Zero Injury Outcomes

With this Safety Position Paper, NAC calls attention to the safety excellence of the member organizations of the Construction Industry Institute (CII). CII members are seeing extended “Zero Recordable Injury” work-hour outcomes in their organizations because CEOs are fulfilling their critical safety role. This critical CEO role entails that the CEO assume primary responsibility in defining and leading corporate “demonstrated management commitment” as the most important CII zero injury research category.

The big question facing interested CEOs is, “How do I do that?” After 27 years of CII research application, the answer is clear: companies whose CEOs excel in demonstrating a commitment to “no employee gets injured” lead in achieving zero OSHA Recordable Injury for the greatest number of hours worked.

NAC urges that CEOs demonstrate their safety commitment by embracing proven ways to demonstrate to employees through a CEO-led “caring for employee well-being safety model.” It is paramount that this model yield employee who individually feel a safety centered well-being at work.

Members of NAC find that CEO involvement in employee safety is singularly the most powerful subject area that gains employee safety buy-in and ownership. This is because personal safety is common to all: nothing is more important to employees than enjoying an injury-free work-life for themselves and their colleagues.

Zero injury outcomes are based on the fact that although many reasons can be found as to *why* injuries occur, there is only one *cause*: some form of at-risk behavior (ARB). Following are three actions CEOs can take:

1. Formally ask all employees to avoid all forms of at-risk behavior.
2. Involve all employees in participative safety activities such as craft safety teams, safety inspection teams, and incident investigation teams.
3. Formally recognize employees for safety achievements using various available means and methods.

In 2016, CII member organizations reported an average Total Recordable Incident Rate (TRIR) of 0.26 with 3.3 billion hours worked. This performance is 13.46 times lower than the 2015 U.S. Bureau of Labor Statistics national average of 3.5 TRIR for the construction industry. The 3.5 TRIR national average represents a recordable injury occurring every 57,143 hours worked. The 0.26 indicates a recordable injury occurring every 769,231 hours worked.

NAC PP No. 42, April 25, 2018, Why the Word “Zero” is a Rational Part of a Stated Safety Goal

It is common to hear from knowledgeable safety specialists, that we who seek a goal of “zero Injury” outcomes face at least four problems.

The Safety Specialists’ Four Problems

1. Using the term “zero injury” in the real world of the construction/maintenance workplace ignores that it is statistically impossible for a group of employees to achieve zero results due to the nature of man and the ever-present risk taking.
2. Using “zero injury” implies you are not concerned with all of safety, but only that which results in an injury. What about safety incidents that occur with no injury?
3. Leaders using the term “zero recordable injury” to establish safety goals promote the possibility of loyal employees not reporting injuries and creates the temptation for management to falsify injury classification.
4. Using “zero lost time injury” in a goal statement ignores the fact that this measurement leaves one accepting an unlimited number of injuries such as restricted duty, job transfer and first aid cases.
- 5.

The Zero Injury Users’ Response

On the premise that these problems are hindering many construction industry participants from embracing the now proven zero Injury safety performance goal, NAC has formally promoted the Construction Industry Institute (CII), zero injury research through its NAC Safety Position Paper (PP) series. These PPs are designed to inform those not using “zero” that these problems do exist and how to apply research based safety strategies to avoid them as follows:

1. When properly used, the term “zero” is ideologically coupled with the term “zero at-risk behavior,” the latter being the root cause of all unwanted events. These terms are used to communicate safety goals that keep the subject of working safe personal to the employees. When employees are personally focused on working safe, all incidents can be prevented more effectively. In keeping the focus personal, the individual worker and the leader automatically promote the avoidance of “at-risk behavior” by all employees.
2. The argument that “zero” is statistically impossible, while true for the long term, is not true for the short term. Replicating the “zero” performance being achieved by many employers promises to improve performance for all to work longer periods with zero injury.
3. There are many reasons injuries are not reported, none of them good. It is a leader’s responsibility to create a team safety consciousness that understands not reporting any injury and gaining the knowledge needed to prevent the next injury, is another form of “at-risk behavior.” Creating an atmosphere where all team members see the importance of integrity in enlisting everyone to report any injuries, will begin to build a culture of injury prevention and eliminate “at-risk behaviors.” It is in this manner that a goal of “zero” is achieved.

4. The word “zero” in a lost time injury goal statement is only the first step in the hierarchy of the progressive zero injury chain of goals. As success comes in achieving zero lost time injuries, those companies seeking continuous improvement will begin setting zero recordable goals and eventually progress to a zero harm goal. Many of the safety leaders in the engineering and construction industry have already moved their safety goal to “zero harm,” one that seeks to eliminate all injuries including first-aid cases and other types of incidents.

CII member reported safety performance on over 3.3 billion work hours, reached a combined Total Recordable Injury Rate (TRIR) per 100 workers of 0.26. This is 12 times better than the U.S. Bureau of Labor Statistics (BLS) national average for 2016 of 3.2 TRIR. In doing so, CII members experienced 48,510 less recordable injuries than average industry members.

Over the last 30 years, CII has conducted multiple instances of academically led research seeking safety best practices, that when used in an informed manner, result in zero injury. Application of these best practices by enlightened and committed employers is resulting in millions of work hours free of OSHA recordable injuries.

Remember: Doubting that Zero injury can be achieved on a project is your enemy. Dozens of reputable companies are achieving zero injury results and are dramatically improving their safety outcomes as they do so. Working more hours with no injury/incident (Zero) is the only statistical path available to improvement. NAC urges any doubting reader to become a believer in zero injury!

NAC PP No. 43, June 18, 2020, What Does a Zero-Injury Safety Program Look Like?

Key Concept: There are many *reasons* injuries occur, but only one *cause*: engaging in some form of “at-risk behavior,” either by leaders or by crafts. The key to zero Injury outcomes is the complete commitment by all employees and all management to avoid any form of at-risk behavior.

A good way to think of your zero-injury safety program is to consider three recommended parts:

- 1. Content**
- 2. Process**
- 3. Culture**

Your CONTENT is administered by your PROCESS, which yields your CULTURE. In other words, your CULTURE results from *what and HOW* behavior you model/teach, *when and HOW* you model/teach it, and finally *why and HOW* your supervision (top leaders through foremen) and informal craft leadership interact with your craft personnel during and after CONTENT implementation. It is easy to see your *HOW* is critical throughout.

CONTENT

Successful owners and contractors have safety programs that yield zero injury outcomes because the content goes well beyond OSHA rule compliance to include multiple “people factors.” To protect your safety program’s integrity in the eyes of employees, you must be 100 percent in compliance with all pertinent OSHA and internal requirements. To not be in-compliance is a form of at-risk behavior and undermines your employees’ confidence in the possibility of zero injury outcomes.

Achieving zero injury outcomes requires your content and process (audit, training, reinforcement) be populated with the safety best practices Leading Indicators (LIs), which are found in the zero-injury research of the Construction Industry Institute (CII). The CII family of LIs are primarily people focused. They can be described as “elements that leadership implements” for themselves and for employees.

CII research has identified over 100 Leading Indicators, ranging from CEO commitment to clean restrooms. These implemented LIs form a bedrock of “working conditions” that create a workplace “atmosphere” that employees and supervision welcome and embrace, an atmosphere that they can look forward to working in each day. Research has determined that these people-focused LIs, when administered properly, can predict and can ensure the absence of at-risk behaviors by both leaders and crafts.

PROCESS

The zero injury culture-building process begins in the Boardroom and continues through an employee’s hiring and employment. At the new employee “screening and qualifying” point, you should begin information sharing on the subject of safety, for example, by emphasizing the avoidance of at-risk behaviors and by convincing supervisory and nonsupervisory craft personnel

that everyone must “sincerely care” about their safety and well-being. *Caring for employees* is a condition of employment and is your key focus on the journey to zero injury outcomes.

Nothing is more important than ensuring the highest quality experience during the hiring and training interface. This begins the creation of a safety culture wherein all employees are successfully enlisted to become co-creators and thus co-owners of “their” safety program. Following the hiring experience, the “safety orientation and training” content begins. This must include introduction to and training on selected CII Leading Indicators in a manner where the employees are asked to participate and share the various participating roles they will be assuming as the Leading Indicators are implemented. By having these roles include craft involvement, safety co-ownership is strengthened.

Seven essential supervisory safety culture-building concepts to implement are:

1. To *always* treat the crafts with complete “dignity and respect.”
2. To further promote this essential co-ownership, all supervisory interface with the crafts must enlist craft cooperation in the following ways:
 - a. Enlist craft involvement in being co-implementers of the CII Leading Indicators.
 - b. Allow crafts to be co-evaluators of LI effectiveness.
 - c. Include crafts as members of safety inspection teams.
 - d. Create an independent “craft only” safety committee.
 - e. Ensure crafts receive formal recognition in ways that create a project-wide comradery (no monetary incentives).

These seven people-focused process elements, along with assessment for learning, become the foundation of a successful safety culture.

CULTURE

At the point where implementation of content is complete using the above process, your culture is in place. However, culture work is “never done.” Culture changes every day, getting better or worse, depending on how well the content and process is followed during that day. The resulting zero injury safety culture will be the product of these foregoing elements. Utilizing the CII LIs and the seven concepts listed above as you execute your safety program process will result in employees beginning to “feel” the work environment in favorable and impressive ways. They will, one by one, become convinced that their supervision really does care about their health and well-being. This “feeling” is the cement that binds the entire project team into a zero-injury-yielding safety program.

NAC PP No. 44, May 4, 2020, How Can “Superior” Safety Performance Go Unnoticed in Safety Measurement?

“Superior” used in the title means safety performance which is clearly the “best of the best.” In the construction industry, these companies’ safety performance records sit atop those that term their safety performance “Excellent.” Superior-performing companies frequently have a Total Recordable Injury Rate (TRIR) in the 0.15 – 0.25 range, which is near or below one OSHA recordable injury per one million hours worked.

NAC advances the position that the achievement of a “superior safety record” begins when a million hours are worked OSHA recordable injury free. Many owners and their larger constructors have the potential to unknowingly achieve a company- or project-wide million-hour OSHA recordable injury free safety performance record yet fail to notice it. The larger the companies are, the more likely this achievement and the failure to notice it may occur. Why? Because the accumulated work-hour total builds faster and faster as the companies increase in total employee count, leaving more chance of an oversight. To ensure these “million-hour” accomplishments are noticed, close attention must be given to the OSHA approved measurement of “Total Recordable Injury Rate” or TRIR. TRIR is in fact a measure of your injury prevention “failure rate.”

To be attentive to one’s “success rate,” one needs to measure hours worked between injuries. For instance, the 2018 TRIR average for U.S. construction is 3.1 OSHA recordables per 100 employees/year. This calculates to about 66,000 workhours between OSHA recordables. Not good! Especially, since the average company contributing data to the Construction Industry Institute/Construction Users Round Table (CII/CURT) safety database works an average of 830,000 hours between OSHA recordables - 12 times better than the OSHA BLS national average TRIR.

How can the “record unnoticed” situation happen?

It can happen when companies do not monitor their safety data for hours worked between injuries and are solely focused on TRIR failure rate records. We need to move towards recording our ‘safety success performance’ to the end of each day.

All readers, whose responsibilities include maintaining this oversight for records, can think of reasons (excuses) why such daily oversight would be impractical. For instance, large companies have dozens of work centers from which safety performance must be collected and reported in a timely manner. An excuse may be “too much data in too short a time.”

A process that may inhibit timely monitoring is each work site or division typically has 24 hours to report a potential recordable injury to the home office. These built-in delays can be used as excuses to remain in the Failure Rate surveillance mode, thus potentially missing the fact that an amazing one million hour “superior record” was achieved and not recognized and celebrated. To overcome this encumbrance, we need to continuously monitor ‘hours injury free’ and retroactively correct the data when injuries occur.

For instance, a company with 5,000 employees would post 40,000 to 50,000 hours per day or 200,000+ hours per week, potentially accumulating one million+ hours in less than five weeks. Accumulating one million hours each 25 days makes it mandatory that the company develop a “hours worked safety success tracking system” alongside the “TRIR Safety Failure Rate” calculation process.

Conclusion

If we do not track the outcome (zero injuries) we desire to achieve, we will not notice something astounding just happened: a million-hour injury free record, which is equivalent to 500 workers in the field for one full year without an OSHA recordable. We call that “Superior.”

NAC Safety Position Paper No. 44 authored by Emmitt J. Nelson

NAC PP No. 45, May 4, 2020, “Hours Worked Between Injury” Is Proving to be a Powerful Metric in Winning Employee Support for Zero Injury Outcomes

In its simplest form, safety success is found in working an increasing number of hours with no injury or illness. OSHA requires contractors to measure and report their annual safety performance record in illnesses/injuries per 200,000 hours worked. Employer annual safety data on any injuries are reported annually on forms OSHA 300 Log, and OSHA 300-A Summary, and post these on the company Bulletin Board each January.

Many contractors and owners keep track of additional safety metrics. NAC urges that all seek a zero injury/ illness outcome and that one of the metrics tracked should always be “hours worked between injuries/ illnesses” and use this metric in communicating safety performance to the employees, especially the craft workers.

It is now widely known in most industries that academic research into how some companies in the construction industry work millions of hours in sequence with no OSHA recordable injury/illness while most employers cannot and the resulting USA OSHA-BLS national average for construction is about 3.1 per 200,000 hours. Dividing this 200,000 by the 3.1, yields a USA National Average of only 66,666 hours between injury/illness.

The good news is, this number was 14,000 in 1989.

However, this injury free sequence of hours does not compare very favorably to the 830,000 injury free sequence hours being achieved by the CII and CURT, (Construction Industry Institute and Construction Users Round Table) member companies. These users of the CII research perform over 12 times better than this National average.

NAC believes there are many dozens of “reasons why” injuries occur, but there is only one cause; that being some form of “at-risk” behavior!

Thus, success in achieving zero injury outcomes, is found in avoiding all “at-risk” events. Employee buy-in and co-ownership of the overall project or company safe-work execution process.

This co-ownership is accomplished through use of the available Zero Injury research of the Construction Industry Institute. www.construction-institute.org. Additional detailed information is available through the National Academy of Construction Safety Position Papers as outlined in this document. NAC Position Paper No. 43 is a good place to start your journey to zero injury outcomes that compete with those CII/CURT members.

In summary, what we all want as an outcome is a greatly extended streak of injury free workhours. There have been recent megaprojects in the USA working over 60 months with over 60,000,000 hours with an ongoing average number of hours between OSHA Recordable injury of only one per 1,100,000 hours. Your company can also perform at this level. What is the

secrete? You begin with caring for and involving your employee in the oversight process of executing your Safety Program. If your question is “Can we afford to do this? the answer is an absolute “yes.” With extended injury free workhours there are projects being built by CII member companies that enjoy a 10% improvement in productivity in addition to avoiding all the cost of avoided injuries. This improvement comes from the process you will be using that empowers your workforce to be co-owners of the safety program. As co-owners they become much more engaged. But only if you embrace and commit to zero injury as your heart desired outcome. By measuring hours worked between injuries you telegraph to your employees what the real objective is, “Zero Injuries.”

This Zero Injury objective is not reached by trying to reclassify an injury; not by not reporting an injury but by avoiding all at-risk behavior and thus being injury free.

NAC Safety White Paper authored by Emmitt J. Nelson and provided by the NAC Safety Committee.

NAC Position Paper No. 46, December 3, 2020, Demonstrated Management Commitment: Zero Injuries Happen When CEOs Lead

In 2003, zero injury safety research by the Construction Industry Institute, (CII) Austin, TX, concludes that the top and most definitive company-wide action to productively change the safety culture is “demonstrated management commitment.”

This demonstrated commitment needs to be made by all company leaders, with noticeable leadership by the CEO. The focus is on moving the concept of setting “safety goals,” a promise to try to do better, to a “commitment to zero incidents/injuries safety.” A *commitment* is a much stronger position than merely a *goal*.

The purpose of the demonstrated management commitment is to convince each employee that nothing is more important to their leaders and supervisors at all levels than the safety and well-being of each individual employee, with all employees committed to help each other go home injury free at the end of each workday. Leaders and supervisors at all levels must *demonstrate*—not simply *express*—their commitment.

CII research results show the best of the CII members involved in the research study are achieving Total Recordable Injury Rates (TRIR) below 0.22, almost 13 times better than the 2019 TRIR of 2.8 published by the U.S. Bureau of Labor Statistics. A TRIR of 0.22 is equivalent to 909,000 workhours between OSHA Recordable injuries. One does not have to drift into hyperbole to say this demonstrated TRIR may seem beyond amazing and into the realm of astounding. It has been demonstrated to be achievable, however, by CII member companies.

Successful application of the CII research results can be significantly enhanced by using what Dr. E. Scott Geller of Virginia Tech refers to as a unique “actively caring for people (AC4P) safety culture.” This AC4P safety culture engages employees in five injury-prevention activities they regular participate in:

1. Near-miss/close-call analyses
2. Safety inspections
3. Craft-only safety committees
4. Enlisting craft employees in selecting leading indicators to measure for injury prevention
5. Using employee-to-employee behavioral observations and coaching

These involvement strategies enable workers to feel a “co-ownership” of the safety process with company leaders and, as such, provide “AC4P” support.

The most successful companies (both owners and contractors) demonstrate their commitment by routinely allowing crafts to participate in and assist with these five injury prevention activities. This participation serves to demonstrate the companies' leadership commitment to all workers and their co-ownership of the safety program. This enhances workers' full buy-in and support. Cultures so equipped are accomplishing documented injury free work exceeding one million hours between recordable injuries.

Authors on the subject of demonstrated management commitment have said it takes the creation of an "employee-felt safety environment/culture." In this case, we can add an essential additional word to this appraisal statement to say it **REQUIRES** the creation of a "FAVORABLY felt working safety culture/environment."

An obvious question is, "Where can I learn just how to create the safety culture to accomplish this almost unbelievable level of safety performance?"

Many publications have been written on this subject. One place to start is to read Dr. Geller's book, *Actively Caring for People's Safety: How to Cultivate a Brother's/Sister's Keeper Work Culture* or by exploring the website of Dr. Geller (<https://www.gellerac4p.org/recent-articles/>).

NAC Safety Position Paper authored by Emmitt J. Nelson

**NAC Position Paper No. 48, Sept. 17, 2019, NAC Recognizes Known
Contractors Achieving One Million Workhours with Zero OSHA
Recordable Injuries**

NAC has concluded that the challenge of achieving the one million-hour zero injury threshold is so important to the industry that publicity should be given to those organizations reported to have achieved or surpassed this mark. The objective of NAC regarding zero injuries is to challenge the vision of all in the industry to embrace the Construction Industry Institute (CII) zero-injury research and free those individuals otherwise destined to be injured from that fate.

In 2011, NAC recognized 23 safety records made by construction companies in North America for surpassing the one million-workhour mark with zero Bureau of Labor Statistics (BLS) OSHA Recordable Injuries for company-wide, division, or project performance.

During the past eight years, those notable 23 have grown by 91 additional records to a new total of 114. Twenty-eight of these records are for over two million hours, nine for over three million, and three for over four million OSHA Recordable Free Workhours. The contractors and owners using the 1993-2003 CII zero accidents research recognized in NAC's Safety Position Paper 23 have achieved and continue to set remarkable safety records exceeding one million workhours with zero BLS OSHA Recordable Injuries.

Specific Companies Listed

The barrier breaker or first known construction contractor to exceed one million hours worked with zero BLS OSHA Recordable Injuries was the Zachry Group, San Antonio, TX, on a 1989 Shell Chemical project near Baton Rouge, LA. Since then, there have been 196 other occasions where one million hours OSHA Recordable Free Workhours have been reported.

An easy way to embrace the magnitude of one million hours worked is to think of it as equivalent to 500 workers being on the job 250 workdays or one-year while remaining OSHA Recordable injury free.

Purpose of NAC Safety Position Papers

Through the Position Papers on Safety, the National Academy of Construction is recommending that American businesses review the collective knowledge of NAC members and the research of the Construction Industry Institute (CII) showing how increasing numbers of employers are able to achieve a million work hours and more without an OSHA Recordable injury.

The nine research-based CII Zero Injury safety leadership categories in this series are:

1. Demonstrated management safety commitment
2. Staffing for safety
3. Safe work planning, pre-project and pre-task
4. Safety education; orientation and specialized training
5. Employee Involvement, behavior safety and safety perception surveys
6. Evaluation and recognition of safety performance
7. Contractor selection and management
8. Accident/incident investigation including near misses, and
9. Drug and alcohol testing.

The ROI of Zero Injury Safety Performance

CII research has proved that the cost of successfully implementing the nine CII zero injury categories is returned at a rate of 400 to 500% per annum when compared to the costs of OSHA/BLS injury rate average performance for the entire construction industry in America.

Information and details on the increasingly popular “Zero Injury Safety Leadership Concept” is available from the following:

Safety Position Papers from NAC

In support of a safer industry, NAC offers at no charge the Safety Position Paper Position Series on how to achieve zero injury to all interested NAC Position Papers are issued after review and consent by a majority of the current members.

NAC Position Paper provided by the NAC Safety Committee: Emmitt J. Nelson, PE, Principal Author

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The NAC Safety Position papers were peer reviewed by the Safety Committee of the National Academy of Construction; Coordinated by Emmitt J. Nelson, PE, NAC, ZIC