

The background of the entire page is a photograph of a large, rusted metal structure, likely a bridge or industrial framework. The metal is dark brown and black with significant rust and weathering. The structure consists of various beams and plates connected by bolts. The lighting is dramatic, with strong shadows and highlights that emphasize the texture and form of the metal.

# Chubb Construction Risk Engineering

Elements of a Proactive  
Safety Culture

CHUBB®



**Elements of a Proactive Safety Culture**

Overview	3
Elements of a Successful Safety Culture	5
Responsibility	5
Project Specific Safety Program	5
Job Safety Task Analysis	5
Accountability	5
Loss Analysis and Trending	6
Leading Indicators	6
Claim Management	6
Safety Committee	6
Accident Investigation and Review	6
Subcontractor Selection and Management	7
Daily Pre-Work Safety Meetings	7
Weekly Safety Meetings	8
Safety Director Reporting	8
Training and Education	8
Insurance Company Involvement	9
Recognition	10
Conclusion	10

## Overview

The U.S. construction industry has a proud history that continues to play a pivotal role in the success of the nation. The men and women of the construction industry have that rare opportunity to show their children, family and friends the fruits of their labor – the projects on which they have worked, including buildings that define city skylines, bridges and roads that are key parts of the country’s transportation infrastructure, and religious, educational and medical institutions that are important to the fabric of community and commercial life.

These men and women also work in a high hazard industry. The construction industry represents approximately five percent of the U.S. workforce, yet is responsible for approximately nineteen percent of all occupational fatalities that occur each year.

Fortunately, the construction industry has successfully improved its overall safety performance. According to the Bureau of Labor Statistics (BLS) in 1991 the construction industry had a recordable incident rate of 12.8 per 100 workers. In 2018 the BLS recordable incident rate for construction was 3.0 per 100 workers. Construction fatalities also have seen an overall decline over the past few years but remain a concern within the industry. According to the BLS in 2018 the construction industry sustained 1008 fatalities compared to 1,239 fatalities in 2006. While this is a reduction of approximately 18.6%, efforts to continually improve and keep pushing these number down need to be made.<sup>1</sup>

Most construction firms understand the importance of a commitment to safety and the impact accidents can have on their employees and bottom line. They also are aware of the harm that serious accidents and resulting negative media attention can have on their companies’ reputation. This is particularly evident to firms that are operating in those

jurisdictions with rigorous oversight of construction projects which may result in an effort to shut down projects with poor safety performance.

Today many construction firms take on more financial risk by utilizing larger deductibles on their practice insurance programs. Many also participate in wrap-up programs, such as contractor controlled insurance programs. Proactive firms often view insurance and safety performance as key contributors to their financial success, equally important as production.

Proactive construction executives understand that, to be competitive in a bidding process, they must control all costs, including the cost of insurance. Implementing and executing a strong safety culture throughout their organizations, with a focus on eliminating accidents, can help with managing their insurance cost over time.

Ultimately a successful and effective safety culture begins with the conviction and support of the company’s chief executive. This individual can establish safety as a core value of the organization. The message should be communicated clearly throughout the organization by the chief executive with accountability put in place to ensure implementation and on-going improvement. Commitment and buy-in of senior management to these safety principles also is essential. A culture of and commitment to safety should exist throughout the organization, not just on the construction site.

The field and study of safety has evolved over the years to include science, engineering, technology, sociology, philosophy and psychology. Many of the safety principles, techniques and procedures introduced years ago remain prominent today on construction projects, helping to achieve positive safety performance. With research and advancement in the field of safety, new methods, ideas and procedures have been introduced to help enhance safety culture within the construction industry

through a “personal based” approach. Although compliance with standard rules and regulations governed by appropriate federal, state and local agencies remains a driving force for organizations, the construction industry is starting to see a shift from strictly compliance-driven safety programs to programs stressing a concern for the workers’ health and welfare, emphasizing the “human side” of safety.

Construction firm executives can embrace and promote a safety ideology throughout their organization by focusing on eliminating dangers at the construction site through an approach that personalizes safety and health. This approach modifies the traditional enforcement mentality, which immediately threatens employees who violate standard safety rules with disciplinary action. Disciplinary action including suspension and termination should remain a feature of a safety program, but not necessarily the immediate course of action for all infractions. Construction companies that espouse “our employees are our greatest asset” should communicate to all of their employees that their safety and health is of paramount importance to the organization. The commitment to providing a safe work environment is a message that should be reinforced at all levels in the company.

The “personal-based” safety philosophy stems from a belief that, if employees are reminded on a daily basis of their home lives and personal relationships, they will be more apt to work safely and avoid risks that could result in injury.<sup>2</sup> This philosophy encourages employees to take the initiative to speak up and take action when noticing a fellow employee working in an unsafe manner or observing an unsafe condition that may expose others to injury. Safety is everyone’s responsibility. The general slogan “if you see something, say something” is equally appropriate on construction projects sites that have an active safety prevention culture.



New employee orientation and safety meetings can be opportunities for employees to share past experiences with construction accidents or dangers they have observed or experienced in their former employment. These meetings also are opportunities for management to solicit input from employees on how they view the safety culture on the project and suggestions for implementing improvement to enhance the safety aspect of the project or activity. In the area of safety, construction workers have a great deal of experience and knowledge that a construction firm can tap into and utilize. Construction firms cheat only themselves when this valuable resource is under utilized.

### Elements of a Successful Safety Culture

---

This section of the Guide outlines recommended safety practices to incorporate into the safety culture of a proactive construction firm. The intent is to identify safety procedures that have proven successful in helping to elevate the awareness of safety and enhance the safety culture for construction firms throughout the country.

**Responsibility:** Construction chief executives should instill in each of their managers from project executive down to field engineer that the responsibility for safety lies with each one of them. Too often the responsibility for safety falls into the hands of the on-site safety manager or corporate safety director. It is essential that all field management personnel understand that safety is not solely the responsibility of the safety manager. Each manager needs to be aware of safety activities and concerns on the job site on a daily basis and take immediate action to address any concern or issue that he or she encounters during the course of a project walk through. Field management should not assume that a safety issue will be identified and resolved solely by the safety person.

### Project Specific Safety Program:

Prior to commencing a project, a Project Specific Safety Plan (PSSP) should be developed. The PSSP at minimum should include:

- overview of the project scope of work
- names, roles and responsibilities of key management personnel assigned to the project
- list of local emergency responders and medical facilities
- emergency procedures and evacuation plan
- fall management and retrieval procedures
- substance abuse testing
- new employee orientation procedures
- safety measures and procedures expected to be implemented and executed on the project

Developing a PSSP requires that the project management team, including safety personnel, participate in pre-job planning sessions. These sessions should include a detailed overview of the project, including a step by step review of each phase or operation associated with the project. The means and methods of construction associated with these phases or operations should be discussed. Throughout these reviews, identification and determination of the potential exposures associated with these activities is essential, followed by identification of controls and procedures necessary to eliminate or control these exposures. During this review a determination can be made if engineering safety elements, for example incorporating anchor points into structural members, will be necessary during the fabrication stage. Procurement of necessary safety equipment also can be identified during the pre-planning stage.

Pre-job planning prior to the start of the project allows for a proactive rather than reactive safety approach, by putting

advanced thought and preparation into the safety aspect of the project which can help the contractor to optimize the likelihood of a safe and successful project.

**Job Safety Task Analysis:** Enhancing the safety performance on the project requires that Job Safety Task Analysis (JSTA) becomes an intricate aspect of the project cycle. Prior to the start of each new activity or phase of construction, a detailed assessment of that activity/operation should be undertaken to address:

- specific aspects associated with the work at hand
- identification of potential exposures associated with the work
- determination of the necessary controls needed to eliminate the exposure
- identification of the necessary safety-related equipment required to perform the work safely

The JSTA should be completed and submitted by the supervisor responsible for the oversight of that particular operation or activity prior to the start of work. The JSTA should be reviewed by the project manager and/or superintendent along with that supervisor. Once the project manager or superintendent feels confident in the information and procedures contained in the JSTA, the supervisor should meet with the crew performing the task to review and discuss the JSTA. This procedure should be followed by all contractors performing work on the project.

**Accountability** *What is measured gets done:* Construction chief executives should have a well-defined and communicated accountability program in place. All levels of management should be evaluated and held accountable for the safety performance of their projects, as part of their overall performance evaluation. Company safety

goals that are reasonable and attainable yet aggressive should be established on a yearly basis. Management performance reviews should include the evaluation of those results. This will help to ensure all management employees are aware that safety is as important as production.

**Loss Analysis/Loss Trending:**

Loss Analysis/Loss Trending is a valuable instrument used in part to analyze and monitor the safety performance of an organization, from divisions to individual projects. This allows a construction company to gage the overall safety performance year over year and measure how their divisions and projects are performing in comparison with the overall company results. It also allows a company to compare/measure itself against competitors. Performing this exercise will help a company to identify a division or project that may be under performing regarding safety, which in turn may be impacting the overall company safety results. Once a project or division is identified as having a questionable safety performance, action can be taken to further investigate potential cause. By honing in on that project(s) or division to identify what the potential issues and causes are, appropriate actions can be introduced to determine corrective steps necessary to improve that performance. Using man-hours as a common denominator similar to the BLS (\*Bureau of Labor Statistics) will allow a company to fairly compare each project regardless of size or complexity.

**Leading Indicators:** By nature, Loss analysis is “Lagging” data – that is, data (losses) that have already occurred. This information allows you to identify and trend what types of losses are occurring, but in the end, it does not alone work to prevent them.

Pro-active companies should also be routinely reviewing their “Leading” indicator data in an effort to identify correlations between what has already occurred “Lagging” and what is in place or should be in place to prevent or control those same losses (“Leading”). Leading Indicators are for example processes, policies, controls or PPE implemented within an organization intended to prevent losses from occurring such as but not limited to; Training programs, required project audits, lessons learned communications, purchase requirements for specific PPE, and equipment fitted with safety devices or designed to minimize worker exposures.

By reviewing both Leading and Lagging Indicators, a company can assess and identify the types of losses occurring from the loss analysis as well as assess their Leading Indicators to determine if there are enhancement opportunities that can better eliminate or control known or potential hazards in their organization.

**Claim Management:** Each project executive/manager should be provided detailed loss runs and claim information pertaining to his or her respective projects, in order to be properly informed and current on the projects’ claim activity performance. This function and information should not be restricted to risk managers.

It should be the responsibility of the project executives, not the risk managers, to monitor the safety performance and claim activity for their projects. Since project executives/managers have ultimate overall responsibility for the performance of their projects, including schedule and budgets, project safety and claim activity warrant the same oversight.

Project executives/managers should also participate in claim review meetings with the company’s insurance provider to gain first-hand knowledge and update on the status of claim activity on their projects. Too often the only construction firm representative at a claims review meeting

is the risk manager. By participating in these meetings, the project executive/manager will have the opportunity to understand and monitor the financial implication associated with accidents that occurred on the project. This understanding should provide a greater appreciation and awareness of the impact that accidents have on the company’s insurance cost.

**Safety Committee:** Construction chief executives should introduce and establish a safety committee within their organizations. Ideally the safety committee should include the construction chief executive, an upper management representative, risk manager, safety director, senior operation personnel representative, and labor representation such as shop stewards. This committee should meet on a regular basis to review overall company performance, discuss safety issues, identify improvement areas, discuss changes to or new safety standards that may have an impact on the organization; and review accidents or near misses that have occurred since the last meeting.

A safety committee enables the establishment of a cross functional teams for the common purpose of promoting safety throughout the organization. It demonstrates the value the organization places on having a proactive safety culture by involving input from multiple disciplines within the company.

**Accident Review:** Construction chief executives should not accept the adage that accidents are a part of doing business. Although construction is recognized as a high hazard industry, the ideology that transcends the company should be that all accidents are preventable. A zero tolerance for accidents policy should be the company mantra. Each project manager/superintendent should meet with the construction executive officer about any loss time accident that occurred on his or her project. The project manager/superintendent should be prepared to discuss with the executive officer the events surrounding the accident.

Facts such as conditions and actions that caused the accident and the corrective actions that will be taken to prevent a reoccurrence or similar accident should be discussed.

Holding accident review meetings on a regular basis between construction field managers and the executive officer of the company can send a clear message that safety should be of paramount importance to everyone involved with a project site.

Investigation into near misses should also be a focus point for contractors. Often detailed investigations and root cause analysis are conducted on accidents that occurred on the project. The focus is on identification of the events or actions that resulted in the accident, as well as appropriate corrective actions necessary to prevent a reoccurrence or similar type of accident. The same attention and detail should be applied to incidences that had the potential to result in a serious accident. Often near misses go unaddressed. Project managers breathe a sigh of relief that the incidents did not result in serious consequences and go about their normal routines. The mistake is in not addressing actions that may continue to take place and potentially could result in a serious accident. Near misses should be thoroughly investigated to identify events that led up to the incident with a determination of the actions needed to prevent a future reoccurrence.

**Subcontractor Selection and Management:** Subcontractors play a pivotal role in the construction project cycle. Depending on the project or the construction delivery method, the amount of subcontracted work could vary from minimal for general contractors that self perform the majority of the work to extensive for general contractors that subcontract the vast majority of the work. Regardless of the level of subcontractor involvement, it is essential that the general contractor give appropriate attention to and thoroughly address the safety aspect of the

subcontractor's activities. The actions of the subcontractor that may result in accidents or injuries can have a detrimental affect on the overall project and could result in potential liability to the general contractor as a result of the subcontractor's action.

Pre-qualifying subcontractors to determine their experience, qualifications and financial strength is common practice within the construction industry. To further enhance the pre-qualification process a review of the subcontractor's safety history and performance should be included in the selection criteria. Augment the pre-qualification selection process of subcontractors to ensure that as much attention is paid to the subcontractor's safety history and culture as is to the bid price and financial strength. The selection process should include, in addition to the overall bid and quote to perform the work, a review of the subcontractor's Experience Modification Rate, BLS incident rate, OSHA history, safety culture and overall commitment to safety. Considering the amount of work that will be subcontracted out it is essential that subcontractors selected demonstrate a pro-active safety culture and commitment to safety that compliments the commitment to and value for safety in the construction firm.

Construction companies should review their subcontract agreement and bid documents to ensure necessary wording and requirements regarding safety are addressed and written in prior to bid and award of contract. This will ensure subcontractors are aware of safety requirements and expectations in advance and do not come back with change order requests.

Common practice is for a general contractor to require that subcontractors submit a copy of their corporate safety program prior to the start of work. Instead, consideration should be given to requiring subcontractors to submit a project specific safety plan at the time of contract award. The plan should identify

all aspects of the project's scope of work for which the subcontractor will be responsible, the hazards associated with the scope of work and the means and methods the subcontractor will use to mitigate the hazards and provide a safe work environment for their employees and others on the project. In addition, the project specific safety plan should include the names, roles and responsibilities of key personnel. This plan should be specific to the work at hand and allow the general contractor to determine if the subcontractor has thoroughly addressed the safety aspects associated with the work and to gage if a proactive safety culture will result. The job safety plan should be reviewed by the general contractor, followed by a meeting with the subcontractor senior management and project manager/superintendent before work starts. The purpose of the meeting is to ensure everyone is on the same page regarding safety expectations and procedures for the project.

A review of the subcontractor's insurance policies should be undertaken as well as ensuring that appropriate risk transfer and hold harmless language is utilized. This language can help to protect the general contractor in the event that liability arises due to the actions of the subcontractor.

**Daily Pre-Work/Safety Meetings:**

A common technique used by construction safety departments is weekly tool box safety talks. Traditionally, one day a week either first thing in the morning or during lunch breaks, a superintendent or foreman gathers the workers together and reads a safety topic sent out by the safety department. A question and answer session follows, ending with the workers signing the bottom of the safety topic page to acknowledge their participation. Tool box safety talks are excellent when utilized properly, and are designed to highlight the importance of safety and involve the workers.

However, having safety talks once a week is not sufficient for a proactive company that is truly committed to implementing a strong safety culture on project sites. A further step is recommended.

Typically each morning a superintendent or foreman gathers with the crew to review the work of the day and give out the workers' assignments. Usually the superintendent/foreman will explain what the operation entails and what needs to take place to ensure the work is completed properly. Workers are told what tools they will need to complete the task, heavy equipment is dispatched to the location if necessary and material either is gathered up by the crews or sent over by truck to the desired location. Once the review of the work at hand is completed the crews are sent off to begin the activity.

This daily start up meeting with the crews is the perfect opportunity to introduce safety into the conversation. Once the discussion regarding the scope of work involved with the activity has concluded, an additional five to ten minutes – more if necessary – should be allocated to addressing the safety aspects associated with the work at hand. The superintendent/foreman should be prepared to discuss with the crew the potential exposures associated with the activity and discuss the safety controls necessary to mitigate them. Soliciting input from the crew regarding activity taking place is recommended to determine if they have any issues or concerns. The superintendent/foreman should not release the workers until they are comfortable that the crews have the necessary personal protective equipment, tools to safely undertake the task and that controls are in place to safely execute the activity.

During the course of the day, should a change in venue or a new activity take place requiring the crew to move on, a short meeting should be held to review this new activity. The potential exposures should be identified along with the necessary controls and equipment to eliminate the exposure.

A few minutes set aside each day to address the safety aspects associated with the work at hand is time well spent both from a production as well as a safety prospective.

**Weekly Safety Meetings:** On most construction projects a superintendent or project manager conducts weekly progress meetings. Usually these meetings are attended by subcontractor field management personnel to review the project schedule and upcoming activity. These weekly meetings are the perfect venue, in addition to addressing production related topics, to address the safety component of the project. The project manager or superintendent should review any accidents or near misses that may have occurred during the past week, issues or concerns addressing safety items picked up during inspections or audits and upcoming activities that could result in potential exposures. These meetings will allow the superintendent/project manager to continue to reinforce the safety message and the need for all involved to implement and execute safety procedures and protocols. When safety is addressed on a regular basis it sets the tone for the entire project and reinforces the commitment of the general contractor to providing a safe work environment for all involved with the project.

**Safety Director Reporting:** The safety director position should be an executive management level position within an organization, reporting directly to the chief executive of the company.

Reporting directly to the company chief executive affirms and validates the importance of the safety director position within the organizational structure of the company. It sends the message that safety is as vital a function of the organization as operations, finance, human resources or engineering. Within most organizational structures the COO, CFO and HR director report into the chief executive of the company. The same should hold true for the lead position for safety. There should be no obstacle preventing the safety director from reporting to and working directly with the chief executive regarding safety related matters that impact the overall success of the company. Just as the chief executive's other direct reports work closely with other team members within the organization the same should hold true with the safety director to achieve a team approach with the desired result.

**Training and Education:** Safety training and education have become more prevalent within the construction industry over the years. This is a result of companies' recognizing the need for and importance of providing safety training and education to their workforce if they are serious about enhancing the safety culture within the organization. In addition many jurisdictions and agencies are mandating that a certain level of safety training be provided to workers engaged in the construction project. For example, a number of jurisdictions are requiring that every worker on a project have at a minimum OSHA 10 hour training, with others requiring additional advanced training for topics such as scaffolding, confined space, electrical and fall management. Many companies have also introduced new employee orientation training that is provided to all workers involved with the project. A number of companies require that their management personnel receive more in depth safety training such as OSHA 30 hour training, as well as more advanced safety training including but not limited to fall management, excavation, electrical and confined space.



This safety training is both essential and beneficial for all workers involved with the construction project. Safety is not just common sense; it requires that workers are provided with the technical and practical information that allows them to safely perform their work.

Safety training and education should be taken a step further for field management personnel. Those who are responsible for managing crews must have the ability to communicate with their workers. They should understand why it is important for their crews to work safely, including the economics prospective. Field managers should demonstrate strong communication and listening skills in order for a company to be confident that they are effectively conveying the intended corporate message and training.

Chief executive officers should closely examine their in house training procedures and programs to determine the level of training being provided within the organization. Is the training restricted to that dictated by OSHA to meet safety compliance requirements? If so, the executive officer, together with the HR and Safety Directors, should ensure that safety training goes beyond OSHA safety standards, for field as well as office management personnel.

Safety training for management personnel should include an understanding of the typical insurance program that is a major component of any project. For most field management people, insurance is an administrative or home office function. These individuals understand they need proper insurance documentation in place before a project can begin, but how many of them understand the cost of obtaining that insurance? A project manager or superintendent should have a good understanding of what an experience

modification rate (EMR) is and how EMR impacts the cost of insurance for a project. The project manager or superintendent should have an understanding of how an EMR is derived and the impacts that accidents have on that EMR and ultimately the company's insurance cost. Additional risk management training should be provided to ensure management personnel understand the specific insurance program in place for the company. With the majority of mid-sized to large construction firms opting for large deductible programs, as well as the popularity of contractor controlled wrap up programs, insurance programs are essential elements of the overall construction projects that management personnel should understand. Management personnel should also be provided training that helps them understand the financial impact that accidents have on the overall project, along with the more traditional OSHA and safety training ensures that a company's field and office management personnel have a more rounded and thorough safety and risk management understanding.

Safety training that is provided at the construction site is usually provided by the superintendent, foreman and/or safety manager. These individuals hold important positions within the construction organization and are the on-the-ground field leaders at the project site. They have been selected for these positions based on their experience, knowledge and demonstrated ability to successfully build a project. Many of these individuals rose to these management positions by starting out as craft labor and through hard work and demonstrated success earned promotions into management roles. As managers they are tasked with the responsibility of leading and managing groups of individuals. Chief executives should determine if, in addition to experience, these individuals are equipped with the skills and training to effectively communicate and lead others.

Often superintendents, foreman, field engineers and safety managers are elevated to management positions without having been provided the training and resources necessary to assist them in becoming successful managers. Chief executives should work with their human resources department to develop a training program that provides field managers with the tools and resources to effectively lead and motivate others. In today's workplace, managers must understand issues such as sexual harassment, civil dealing with the work force and general public, ethics and corruption. Chief executives need to be confident that their managers have the skill level to perform the work for which they have been selected. How these individuals handle themselves on construction projects is a reflection of the organization. Failure on their part to represent the organization in a positive light, including on the subject of safety, can tarnish the reputation of the organization.

**Insurance Company Involvement:** General contractors align themselves with subcontractors and vendors who have a proven track record in the industry and with whom they have established a strong bond of trust. Although price is a factor in the selection and decision making process, successful general contractors recognize that reliability and their ability to trust their construction partners are paramount to long-term success.

When selecting an insurance company, construction firms need to identify insurers that have a proven track record in the construction industry. They should align with an insurer that understands their business and wants to partner in the design of an insurance program to meet a construction firm's business needs. While cost is a factor, general contractors should realize that selecting the lowest priced insurance program does not always prove to be the optimum decision. The upfront savings in lower premium may cost more over time if the insurer is unable to deliver the necessary services or claims management.

General contractors should select an insurance company whose underwriters will work closely with and listen to the needs of the contractor's risk management department. An insurer should have professionals with a strong understanding and knowledge of construction operations and safety who will work closely with the firm's safety department, helping to enhance the safety culture within the organization. The insurer should have a strong claims department with deep knowledge of the construction industry and the expertise to effectively manage claims.

General contractors should demand from their insurance company quality service that assists them in managing their insurance cost, helping to enhance safety culture and assist in reducing claim activity.

**Recognition:** Employers have certain responsibilities to provide a safe work environment for their employees. At the same time, it is the responsibility of employees to abide by the safety requirements and work safely.

Offenders whose actions go against safety rules and regulations may be exposed and reprimanded, Yet positive actions are often taken for granted and not noticed. Construction executive officers should recognize and promote successful results and milestones. When milestones or goals are met – such as a pre-determined number of man-hours worked without a lost time accident or completing a full year with an incident rate that meets or exceeds the established goal – executives should celebrate the achievement.

For example, invest time and money in safety awards luncheons to acknowledge both management and workers for a job well done. Make sure all individuals involved understand what they have accomplished, the meaning of working safely, and its impact on the overall project and organization.

## Conclusion

---

The U.S. construction industry has a proud history and an exciting future that depends upon having talented and dedicated construction workers.

With opportunity comes a responsibility to construction workers. Construction firms should continue to enhance their current safety culture to ensure their employees have a safe work environment. To achieve this, construction firms regardless of size should strive to continually improve the safety culture within their organizations, cultivating an environment that embodies a collaborative approach toward safety. From chief executive officers to the construction workers on a job site, all employees should be involved in and accountable for safety. Management needs to provide the resources, equipment and training for every worker to ensure a safe working environment. Every worker should be responsible for his or her own actions, as well as for the actions of fellow workers. Construction firms can achieve a proactive safety culture when management and employees work together as a team to make safety a core value on each project site.

## References/Acknowledgements:

---

1. <https://www.bls.gov/iif/oshwc/cfoi/cftb0322.htm>
2. Hunter Roberts Construction Company







# CHUBB<sup>®</sup>

## About Chubb

---

Chubb is the world's largest publicly traded property and casualty insurance group. With operations in 54 countries, Chubb provides commercial and personal property and casualty insurance, personal accident and supplemental health insurance, reinsurance and life insurance to a diverse group of clients. Chubb Limited, the parent company of Chubb, is listed on the New York Stock Exchange (NYSE: CB) and is a component of the S&P 500 index.

Chubb is the marketing name used to refer to subsidiaries of Chubb Limited providing insurance and related services. For a list of these subsidiaries, please visit our website at [chubb.com](http://chubb.com). Insurance provided by ACE American Insurance Company and its U.S.-based Chubb underwriting company affiliates.

The opinions and positions expressed in this report are the authors' own and not those of Chubb. The information and/or data provided herein is for informational purposes.

## Chubb. Insured.<sup>SM</sup>

Chubb is the marketing name used to refer to subsidiaries of Chubb Limited, providing insurance and related services. For a list of these subsidiaries, please visit our website, [www.chubb.com](http://www.chubb.com). Insurance is provided by ACE American Insurance Company and its U.S. based Chubb underwriting company affiliates. All products may not be available in all states. This communication contains product summaries only. Coverage is subject to the language of the policies as actually issued. Surplus lines insurance is sold only through licensed surplus lines producers. Loss control evaluations, reports, recommendations and services are made solely to assist the insurer in underwriting and loss control and are not to be construed as an added benefit for the insured, property owner or any other party (this may not apply if loss control services are purchased separately and specifically pursuant to a service agreement). Evaluation for any hazard or condition does not imply that it is covered under any policy. Chubb is the world's largest publicly traded property and casualty insurance group. With operations in 54 countries, Chubb provides commercial and personal property and casualty insurance, personal accident and supplemental health insurance, reinsurance and life insurance to a diverse group of clients. Chubb Limited, the parent company of Chubb, is listed on the New York Stock Exchange (NYSE: CB) and is a component of the S&P 500 index.