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# Sharing EH&S Responsibility, Shared Success

Submitted by:

**UTC Fire & Security**

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## *Executive Summary*

UTC Fire & Security is a leading provider of integrated security and life safety solutions that protect people and property the world over. Our products and services are developed and delivered with the purpose of preserving the health and safety of people and the environment. Since UTCFS was first established, the company has increased sales from \$2.5B to \$6.5B between 2003 and 2010, respectively. While return on sales for the same period increased from 4.5% to 12%.

UTC Fire & Security is a unit of United Technologies Corporation (UTC). UTC first entered this segment in July 2003 with the acquisition of Chubb, a world leader in security and fire protection services. In April 2005, UTC acquired Kidde Plc., a leader in fire detection and suppression, and joined it with Chubb to form UTC Fire & Security, now the number two player in the global fire and security industry. After more than 60 acquisitions in 35 countries through 2010, UTCFS is providing services to over one million customers, with approximately 46,000 employees. Services include comparatively high-risk businesses like cash logistics (cash in transit), compressed gas installations, armed response, and service in chemical plant and oil platform operations. Our engineering expertise and technical development centers around the world are committed to developing state of the art solutions that solve our customers' problems.

Through our continuous focus on elimination of risk, UTC Fire & Security has consistently exceeded EHS targets achieving significant improvements over just five years. The relentless effort to identify and address business risk early in a process has resulted in a solutions minded EHS culture. This is evident in the products we design, our relations with customers, and our commitment to protecting people, property and the environment. UTC Fire & Security businesses have been recognized around the world by government agencies, customers, trade organizations, and our parent organization.

EHS is embedded in everything do; safety is at the heart of our business. Our respect for our employees and the environment is illustrated by excellent EHS progress since being formed in 2005, including reductions of :

- 96% in LDIR, and 85% in TRIR
- 75% in fatalities and serious injuries

- 74% in air emissions
- 27% in total industrial process waste
- 40% in non-recycled industrial process waste
- 36% in water consumption
- 20% in greenhouse gas emissions

Relying on leading, event driven indicators to change culture, we are committed to continuous improvement and innovation. To accomplish this we must routinely evaluate our processes and associated measures both internally and through benchmarking.

These achievements occurred by integrating EHS into all facets of our business, including due diligence, fleet management, building upgrades, process and product development, strong partnerships with other core functions and employee engagement. EHS has been a critical building block for the company as it has grown. Employees are involved in decisions and processes that affect their work, including hazard risk assessments and incident investigations. Despite our size and geographical reach, the importance of safety is recognized in all areas of the organization. The progress of our operations is assessed regularly to ensure implementation of key programs. Global standards are set to ensure appropriate equipment choices, including crash rated vehicles and ergonomic designs for the service businesses.

As a business delivering life safety and security services and products, we pride ourselves on putting “Safety First” in all our activities. To ensure EHS performance is sustainable we follow our corporate EHS Management System consisting of 12 elements and supported by Cardinal Rules, Minimum Operating Requirements and EHS Standard Practices. In addition, special emphasis programs are developed based on identified risks and often communicated through our “Safety First” platform. A focus on effective acquisition integration, management system implementation, and employee engagement has ensured our results are sustainable as our business evolved.

As part of UTC, we believe that successful businesses improve the human condition, and we support the communities where our employees live and work. In 2010, UTCFS contributed time and resources to organizations around the world that promote safe and secure communities, environmental stewardship, and

education. The groups often support our mission as a life safety company, such as those providing fire safety awareness and protecting the health of children who have been victims of fires.

To produce superior products in a responsible manner, UTCFS companies work with suppliers and contractors who meet high standards for business practices, environmental responsibility and operational excellence. Together efforts are focused to ensure delivery of world-class products and services that delight customers.

Our customers have acknowledged the emphasis on EHS and have awarded us accordingly. We have preserved brand recognition for our acquired companies, while quickly and effectively integrating them into UTCFS by implementing standard systems, values and vision that are then adapted to the local business needs. Since the creation of UTC Fire & Security only 6 years ago, we have become one united entity with EHS an important element of a mission to “Be the Best” in what we do. The best place to work, buy, and invest.

The first encounter any new UTCFS organization makes is with the EHS Cardinal Rules where the core expectation is communicated - we will grow the organization and at the same time keep our employees and customers safe. Safety will not be compromised. All of our programs are an outgrowth of this guiding principle. UTCFS is a life safety company that embeds these considerations in all aspects of the business:

We keep our customers safe through the fire prevention and security services we provide;

We keep the environment safe by developing products that use less water, deliver green suppression agents when fighting fires, or help create efficient buildings through integrated security systems;

We keep our employees safe by developing creative programs to eliminate risk and requiring all employees maintain the highest job site standards;

And we keep our communities safe by supporting key public service initiatives to raise awareness about fire risks, support firefighters and improve the lives of fire victims.

## ***Section I: Business Profile***

In 2003 United Technologies Corporation (UTC) entered the fire and security segment with the acquisition of Chubb plc (~48,000 employees) a service business with global operations. UTC further expanded in 2005 by acquiring Kidde Plc (~9,000 employees) to form UTC Fire & Security (UTCFS) (See Appendix 1 for a company overview). Since 2003, UTC has invested more than \$9 billion in over 60 acquisitions (Figure 1). The most recent, GE Security, occurred in March 2010, reinforcing our status as a leader in the industry (Figure 2).

UTCFS is now a leading provider of life safety products and services. We are a \$6.5 billion company (Figures 3-4) with employees in more than 35 countries serving more than 1 million customers with high quality fire safety and security products and services including customized system design and firefighting training for personnel. Other services include alarm response, on-site security personnel, and cash logistics. The company is organized into 7 different business units, both by geography and business type (Figure 5). There are two International Standard Industrial Classification (ISIC) that best describe UTCFS: 8020 - Security systems service activities and 4321 - Electrical installation. These ISICs represent our manufacturing and service portfolio.

Greening the product portfolio is a business priority at UTCFS where acquisitions and new product reviews contribute to the advancement of environmentally friendly products. Marioff builds the HI-FOG® water mist system, which uses up to 90 percent less water than conventional sprinkler systems. In 2009 the HI-FOG® system was awarded the UK Waterwise Marque for its efficient use of a natural resource. A product recently developed by one of the UTCFS business units, AquaGreen XT™, is a new wet fire suppression agent for industrial vehicles, replacing the more toxic and less effective dry chemical agent typically used. In addition, we are working to reduce the environmental impact of our firefighting foams with the introduction of a fluorine free foam for suppression of petroleum based fires. The Nexus line of boiler controls created by Fireye help reduce fuel consumption by 5% or more. Lastly, an Onity product, SensorStat® DDC, uses a proximity sensor to detect the level of occupancy in a room, and adjust comfort systems, reducing energy use.

UTCFS serves a variety of customer segments including marine, petrochemical, financial, government, telecommunications, utilities and many others. Some of the world's most discriminating customers rely on our products and services to protect their assets, including the Eiffel Tower, Statue of Liberty, Shanghai Metro Line,

and USS New York, built to commemorate the 9-11 attacks. Since 2002, all major cruise ships built have been equipped with Marioff's HI-FOG water mist fire protection system.

The challenge in building a business consisting of multiple acquisitions is standardization of programs and platforms. To form a cohesive business, UTCFS had to build a foundation of standard approaches. Implementation of global programs for EHS, quality, ethics, field and factory productivity, supply chain, and product rationalization have been essential to creating an efficient, profitable company. The EHS program is one of the foundation systems used to integrate new acquisitions. UTCFS World Headquarters (WHQ) mandates the "what" and "why" for the program, while enabling each unique business to determine "how" the requirements are implemented. All acquisitions learn quickly that EHS excellence is an expectation and core value. Executive management is routinely judged not only by their financial performance but by their EHS implementation results.

Our parent company, UTC, recently recognized us with the Board of Director's Trophy for superior performance in integrating our most recent acquisition, GE Security, a 5,000 employee organization. A strong cross-functional team, including the Director of EHS, cooperated using processes perfected over 5 years of acquisition integration to quickly assimilate GE Security into our culture and systems. Unlike other acquisitions, GE Security already had strong EHS systems in place. This brought a different set of challenges - rather than simply instilling an EHS culture, we had to adapt existing systems. We also integrated their best practices, recognizing the value in preserving proven programs. Our EHS supplier efforts have been adapted while the UTCFS injury prevention initiatives supplemented the GE portfolio. At the UTC EHS conference last year, UTCFS EHS was asked to present our integration process, which has become best in class with time and constant revision as lessons were learned (Appendix 2). Another recent acquisition, Gulf Security Technology (GST – a >2000 person operation in China), won the 2010 UTC EHS Award for New Acquisition Integration of EHS Standards, while an established UTCFS company, Hong Kong Electronic Security, won the 2010 award for Health and Safety Management.

With this array of products and services our leadership continuously challenges our operations team to achieve EHS excellence. To ensure this we follow our corporate EHS Management System (EHSMS) consisting of 12 elements and supported by Cardinal Rules, Minimum Operating Requirements and EHS Standard Practices (Figure 6). Performance is measured using global leading and lagging indicators and a robust EHS management

system audit process (Assurance Review). Results are reported up through our management chain. As UTCFS grew from a group of acquisitions to one cohesive organization, EHS evolved from a program focused on reducing lagging indicators, to a global culture integrated into every facet of the business working to eliminate hazards rather than just mitigate risks. Our customer base has recognized this as we form strong partnerships with companies that also have high EHS standards (discussed in further detail in section VI).

We continue to focus on our number one asset - our 46,000 employees. Our goal is to “Be the Best Place to Work,” keeping our employees and their communities happy and healthy. To this end we have implemented multiple levels of hazard elimination strategies from the inception of a new product or project bid, to the daily servicing of a fire extinguisher, to the armored vehicles used in cash logistics. We support our employees’ external activities. The company was recently awarded the US Department of Defense Patriot Award for providing resources to our reservists.

UTCFS is unique in its diversity of business segments. Our presence in over 35 countries (~89% of employees reside outside the US) present challenges to implementing global programs. There are different risks inherent in each type of business. For example, the highest risk in the alarm response and cash logistics businesses is the use of firearms, by our own employees and perpetrators. On the other hand, the highest risks to a fire hose manufacturer is the hose vulcanization and high pressure leak testing. Significant reductions in injuries and environmental impacts (discussed in detail in section V) are the result of high level assessment, prevention, and control programs which allow specialized focus on local business risks through the weaving of EHS into all critical business processes. This allows us to manage EHS implementation on a global scale while encouraging local ingenuity that results in the development of best practices shared between businesses and across geographical boundaries.

## ***Section II: Leadership***

The EHS function receives the same attention as all other business matters. Leadership reflects the priority through their own actions, the objectives flowed down through the business, and internal and external communications. From monthly reports to the company website to meetings with the UTC Board of Directors, EHS is an important standard component of the UTCFS message – expressed on a regular basis with consistent emphasis on goals, qualitative as well as numeric. They highlight and praise positive progress while challenging

the organization to continuously improve. The leadership of acquired companies quickly learns that EHS is non-negotiable. UTC acknowledged this culture in 2008 by awarding us the UTC Robert F. Daniell Excellence Award.

This commitment starts at the top with our President, Scott Buckhout, and his team of direct report executives, including a Vice-President of EHS. Buckhout took leadership of UTCFS in March 2011, after leading the Global Fire Products (GFP) business segment for 2 years. His commitment to EHS excellence is reflected by the progress of GFP, our largest business region. Through his actions, he communicates the message that protecting the health and safety of our employees, our customers, and the natural environment is a core value within UTCFS.

The EHS policy is reviewed, signed, and distributed annually throughout the company by Mr. Buckhout and the presidents of our 7 business units (Figure 7). It is then provided to employees through the individual organizations. The UTCFS EHS policy states that,

“Protecting the health and safety of our employees, our customers, and the natural environment is a core value within UTC Fire & Security. We will not be satisfied until our workplaces are safe from hazards, our employees are injury free, our services and products are safe, and our commitment and record in regulatory compliance and protection of the environment are unmatched.”

Mr. Buckhout holds Quarterly Management Briefings for the top managers around the world (~200). These include an update on EHS performance where results are evaluated and commitment to pursue EHS excellence is renewed (Figure 8). He also reinforces the EHS focus to senior leadership during site visits. Ahead of each visit he reviews a summary of each organization’s EHS performance and challenges, enabling him to address site specific concerns (Figure 9). In 2011, UTCFS began publishing integrated sustainability reports covering three different topics in sequence – people, process, and stewardship. They are distributed through e-mail to key management contacts (~200) (Appendices 3-5). The VP of EHS also sends quarterly business specific updates the presidents of the 7 business regions (Appendix 6).

The leadership of new acquisitions often receives Management EHS Leadership Training (MELT) soon after joining UTCFS. It provides an introduction to the UTCFS philosophy, objectives and management system



to ensure an understanding of our EHS commitment. Excerpts of the slides for the two-day training class are attached in Appendix 7.

EHS' place as a core company value is communicated during MELT and other employee training, and subsequently reinforced through leadership's support for EHS programs. Management at all levels commit human, financial and technical resources to enable the business to achieve remarkable EHS performance. Initiatives to meet established EHS objectives are developed each fall for the coming year in conjunction with the business planning cycle, and are presented by the business units to the President alongside other business objectives. See Figure 10 for an example of a business unit's EHS planning presentation slides. The budget necessary to achieve the planned initiatives must be determined at this time as part of the process.

Management is directly involved in the process through practices such as the EHS Committees, required by Element 2 (details in Section III) of our EHS Management System (EHSMS). These ensure that programs are measured and tracked. The senior management in each local business runs an oversight committee, with subcommittees that communicate employee ideas and concerns. Information is reviewed and shared between the committees by EHS staff and line management. For example, a solution to mitigate an existing risk may be developed by an employee subcommittee, and then communicated to the management oversight committee for review and dedication of resources. In addition, the World Headquarters (WHQ) EHS staff meets monthly with the EHS leads of the seven business units to share information and develop initiatives that impact the businesses. The committees and the communication channels they provide are important aspects of our EHSMS Elements 2 (Organization) and 7 (Communication) respectively.

EHS projects, goals and targets are part of each business leader's performance objectives (as required by EHSMS Element 4 – Accountability) through our Performance Feedback Tool (PFT) (Figure 11). Every UTCFS senior manager is given measurable EHS targets on an annual basis with specific actionable items to help the overall business achieve EHS goals.

Management is also held accountable by the inclusion of EHSMS and regulatory compliance in the quarterly Sarbanes Oxley review. This is certified with financial, legal, and ethical business practices by the senior operations and finance management in the business. Deficiencies can result in action plans submitted to

finance and signed off by business leaders using an internal process (Figure 12). The certification of EHS in the quarterly financial review process enhances the accountability for performance and compliance.

Global and local programs increase awareness and involvement in risk mitigation. To promote this, WHQ established the EHS IDEA process to encourage employees to develop creative solutions to EHS challenges. Winners Identify, Eliminate and Adhere to a solution created to address a specific EHS hazard. The latest winner installed a system to capture and reuse carbon dioxide from fire extinguishers brought back by service technicians (Figure 13). Another business redesigned a fire suppression system to eliminate the need for technicians to work at heights during servicing (Figure 14). In addition to WHQ recognition, organizations have created their own unique programs. For example, a Hong Kong business introduced a program to honor superior EHS performance for employees and contractors, awarding a monetary prize during an annual banquet held by the local leadership team.

In addition to strong internal programs, UTCFS leadership encourages employees to think about EHS at home. Policy and Leadership, Element 1 of the EHSMS, directs all levels to foster external partnerships between the company, its employees, and their communities. As a life safety company, we are dedicated to improving the safety and security of our environments, and we promote safe communities by reducing threats from fire, crime and natural disasters.

In 2010, UTCFS donated more than \$1.8 million to charitable organizations around the world, as well as employees' time and expertise. These donations are focused on two strategic areas: Safe & Secure Environments and Math & Science Education. However, the diverse nature of UTCFS businesses does not lend itself to one global program for corporate citizenship; rather each company is encouraged to partner with local organizations that can benefit from their specific talents. Appendix 8 illustrates just a sample of the partnerships existing between UTCFS companies and organizations in their communities.

UTCFS' EHS responsibility extends to contractors. Standard Practice (SP) 010 establishes a set of specific requirements for contractor management. These include a risk assessment of the work to be performed, communication of adequate controls, and inspections to ensure those controls are in place. The selection of contractors considers their ability to perform work in a safe, environmentally responsible manner. UTCFS programs are also shared with contractors to ensure they understand hazards as well as our own employees. For

example, there are inherent risks to installing fire suppression systems due to the potentially large number of compressed gas cylinders. To help drive safe behavior, UTCFS conducted the same suppression system training for contractors in 2010 that had been completed for our employees in 2009. They are also required to conduct the same EHS audits as UTCFS employees (Figures 15-16). These tools have been deployed worldwide in multiple languages (described in further detail in section III).

The supply chain is closely integrated into the EHSMS through roles and responsibility requirements for internal functional departments and company objectives. Key suppliers are audited to the UTCFS EHS Expectations. Selected suppliers are evaluated on-site by trained UTCFS assessors to confirm initial self assessments. The EHS requirements are directly tied to company objectives, where each supplier must meet the expectations within 18 months of conducting self-assessments, and before nomination for the UTCFS preferred supplier program, Supplier Gold. There are currently 160 suppliers globally participating in this program (Figure 17 reviews current progress in China).

EHS is involved in business and property transactions at both a local and WHQ level. We have the responsibility to identify potentially dangerous situations and develop systems that will respond appropriately to protect life, the environment, and property. A robust EHS integration process evaluates employee exposure either in manufacturing, at a construction site or on a service call. During due diligence for the GE Security acquisition, EHS obtained information for use in compliance audit planning and permit registrations. Within three weeks of closure, twenty-five compliance audits had been conducted and eighty-three permits assessed. Within sixty days, all compliance audit findings had been closed - some with short-term mitigation actions while more robust, long term solutions were developed (Figure 18). This accomplishment was the result of cooperation between multiple business functions. The team recognized that immediate contact with and attention to GE Security businesses would facilitate the integration of the company into all business processes concurrently. WHQ senior management visited specific locations the day of the announcement to welcome the GE Security employees and present the vision of UTCFS, including our EHS culture.

EHS has participated on 100 percent of the acquisitions that have created UTCFS, working closely with legal, business development, human resources, supply chain and other functions. EHS managers are often sent to potential acquisition sites to complete an EHS assessment. As part of the acquisition integration process, we

assess the potential for negative impacts on the local community. With the Kidde acquisition, UTCFS inherited a facility in Ranson, West Virginia that dated back to the 19<sup>th</sup> century and had impacted the area. The site was decommissioned and the surrounding area and building were remediated. The site was donated to the town for a brownfield development project to help revitalize the area. UTCFS provided a grant for support (Figure 19).

### ***Section III: Integrated EHS Management System***

The UTCFS EHS Management System (EHSMS) consists of 12 Elements that provide the framework for identifying and controlling EHS hazards (Figure 20 ). Contained in the EHSMS are a list of Minimum Operating Requirements (MORs) (Appendix 9) and Cardinal Rules (Appendix 10). MORs list specific organizational obligations for developing programs and providing tools where required, such as machine guarding, fall protection, and secondary containment for chemicals. Cardinal Rules state employee obligations for using those tools, such as never defeating a machine guard. Specific requirements by EHS media are supported by seventeen Standard Practices (SPs) (Figure 21). An additional document provides guidelines and rules for conducting Functional Hazard Risk Assessments (FHRAs) on processes that, if compromised, could cause catastrophic impacts on people or the environment. Figure 6 illustrates the links between these various requirements that facilitate injury prevention and reduction of environmental impacts. The framework of these programs is provided by UTC. UTCFS has tailored the system to control business specific risks with our own standards, that also include Cardinal Rules (Appendix 11).

#### **EHSMS Element 1 – Policy and Leadership**

Leadership commitment is outlined in detail in section II. Corporate leaders provide strategic direction to the program and visible demonstration of their commitment by example. This includes senior management for WHQ and business regions, as well as the management teams at our individual companies.

As our EHS program evolves, leadership identifies methods to drive behavior that contributes to best in class performance. One example is the development of our EHS requirements for fleet vehicle procurement. The standard requires all new/replacement fleet vehicles procured for business need to have a New Car Assessment Program (NCAP) 4-star crash test rating or equivalent, and be more fuel efficient than the vehicle being replaced. The standard was based on root cause analysis of vehicle accidents and is managed jointly by Supply Chain Management and EHS. The standard, along with global high risk defensive driver training, has helped reduce the

number of collisions per million miles driven for UTCFS, while also significantly decreasing our greenhouse gas impact. Recent analysis of the average age of fleet vehicles correlated a decrease in a vehicle's efficiency and increase in fuel costs to the year it was procured. Discussions between the UTCFS VPs for EHS and Finance proposed revising the standard to prohibit procurement of any vehicles greater than 2 years old (Figure 22).

EHS performance is included as a key indicator of organizational excellence through the UTCFS operational quality and efficiency program – Achieving Competitive Excellence (ACE). All organizations are required to implement the ACE program in their departments. Progress to EHS targets is required to obtain the various levels of certification. Required EHS objectives include performance on EHS metrics, audit scores, and implementation of specific EHSMS elements. A site cannot advance to the next level if they are not meeting their EHS objectives, regardless of operational successes. EHS is considered an essential element in an organization's process improvements and it is understood that the organization is missing key pieces of the ACE program if they cannot meet their EHS objectives (Figure 23). ACE and EHS are often implemented concurrently at new acquisitions because of the close ties between EHS performance and operational excellence. The programs are symbiotic. A great example is an ACE "5S" event conducted for the technician vehicles in Canada that helped reduce inventory while also improving the fuel efficiency and safety of their vehicles.

#### EHSMS Element 2 – Organization

Element 2 requires each business entity to have an active EHS Oversight Committee chaired by the Senior Operations Manager. Objectives include reviewing and approving policies, plans, audit results, and other initiatives and the associated human and financial resources. The team and its employee subcommittees must ensure that appropriate procedures, programs and activities are in place, and that employees participate in the development and implementation of EHS programs.

Organizational roles are described in specific detail, in an appendix to the EHSMS – see Figure 24 for an excerpt. Accountability rests with the operations team for the delivery of a safe workplace and clean environment. This is consistent with our mission as a life safety company; it reinforces decision making at all levels of the organization.

#### EHSMS Element 3 – Planning

Each operation documents an annual EHS plan, as described in section II. The plan establishes a roadmap and activities to achieve measurable objectives consistent with the EHS Policy. Responsibility, target dates, and necessary budget are outlined for each initiative. Methods to maintain regulatory compliance and address emerging business issues are also assessed to ensure potential hazards are identified and controls planned before the issues affect the workforce. EHS goals and required resources are imbedded in the annual financial review with the UTCFS President (Figure 10). Refer to Appendix 12 for an annual plan template created by WHQ to assist our businesses during the process.

#### EHSMS Element 4 – Accountability

All levels of the organization are held accountable for their actions. General job descriptions include EHS responsibilities. The disciplinary policy for violating EHS rules and procedures is the same one used for other violations. In short, accountability for EHS is not considered separately, but is an integral part of the overall accountability system for all business objectives.

#### EHSMS Element 5 – Assessment, Prevention, and Control

The road to superior EHS performance begins with knowledge of our business risks, especially by the employees delivering our products and services. Hazard recognition training gives employees the foundation to assess their work environment prior to initiating a task both on the job and at home. Employee knowledge is supplemented regularly through Safety First communications campaigns. Appendix 13 includes an excerpt from the UTCFS Safety First campaign on a hazard assessment process known as S.A.F.E (Scan, Assess, Fix, and Execute). The objective is to prepare employees and create situations that will prevent an incident by eliminating or controlling a hazard early in the process; changing employee behavior by giving them skills that become second nature so they practice them every day (Figures 25-26).

The S.A.F.E. process is well-received and considered effective in practice. Pilots are currently underway to integrate it into the software, iService, which many UTCFS service organizations use to schedule and communicate with employees via a handheld device. Once completed, the system that electronically delivers work schedules to technicians will concurrently require hazard assessments before each project. Initial feedback is very positive and giving them this daily reminder to practice S.A.F.E. will help them modify behavior over time (Figure 27).

Behavior based safety programs can help our employees use their hazard recognition skills to their full potential. Knowing what to look for is the first step, but sometimes there are factors that interfere with the execution of hazard recognition during a job. Behavior based safety programs are deployed regionally and tied directly to individual business risk. South Africa Armed Response is developing a new program called “Not On My Beat” that supports motor vehicle safety. The program was generated as a result of root cause analysis of a motor vehicle related fatality in November 2010. The employee had not been at fault, but he was not wearing his seatbelt. To facilitate employee and supervisor awareness, seatbelts now have brightly colored markers so use is clearly visible. Concurrently, the behavior based approach will coach employees to intervene when colleagues do not comply. The objective is to give employees the message that “no one ‘on my beat’ will die because I neglected to act.” UTCFS’ Americas Fire Safety and Security (AFSS) business is using a behavior based safety program called SafeStart (Figure 28). It seeks to instill in our employees a constant awareness of potential hazards. The methods involve repetitive reminders of 8 simple concepts that lead them to unconsciously behave safely, both at work and at home. Most of us already have an example of this theory in use – putting on our seatbelts as soon as we get in a car. We do it without thinking. Our mature EHS system, after only 6 years of the company’s existence, leads employees at all levels with programs that prevent injuries and pollution early in the processes that can lead to these issues. SafeStart ties into that strategy.

Hazard recognition is important for each operation to continually identify and assess EHS hazards and risks of activities, process, systems, products and services. The second focus of Element 5 is to implement prevention and control strategies that effectively manage each level of risk identified during the assessment. Processes are given a numeric risk rating based on current controls. Additional controls are planned according to the risk level identified. Appendix 14 includes a WHQ template for a comprehensive risk assessment. Hazard elimination is always the preferred option for preventing injuries and environmental impacts. For example, many of our operations, including SICLI in St. Florentin, France, have replaced wet chemical based painting operations with powder, eliminating both employee exposure and air emissions related to the solvents contained in traditional wet paints. Plans are also underway to reduce employees’ exposure to noise and eliminate the need for hearing protection where legally possible.

Where elimination is not possible UTCFS has implemented inventive engineering controls. Working at heights is a risk in both fire and security operations. A UTCFS fall protection guidebook establishes best practice safe operating procedures for elevated work (Figure 29). The guidebook is a comprehensive tool that teaches employees about safe-work practices on roofs, ladders, ceilings, poles, etc. This document has been well received by our business units and widely shared within their operations. The tool assists operations in developing solutions for non-standard work, such as servicing alarm systems in suspended ceilings. Figures 30-31 illustrates examples of inventive controls.

Within this same EHSMS element each operation is required to develop and implement employee medical programs, emergency planning/response, contractor and supplier relations, business and property transactions, and management of change. The UTCFS management of change (MOC) process is applied to products, services, processes, systems, operations and any other business change with potential EHS impacts. MOC is implemented at all levels of UTCFS from alterations to processes at individual factories and service organizations up to WHQ and regional business unit planning, design, and modification of products and services. New chemicals being considered for use are assessed for toxicity, potential employee exposure and environmental impact. Proposed new processes or major modifications must assess all EHS risks (Figure 32). Employees are consulted on new controls or tools resulting from the change to ensure that they will not be required to work in an awkward position or take an unnecessary extra step. This mindset is another example of the interweaving of ACE and EHS. Work instructions and procedures, such as waste management and hazardous energy control (LOTO) documents are updated to reflect the changes, or created for new processes.

Employee engagement in risk mitigation has been demonstrated in our cash logistics operations, or Cash in Transit (CIT), with ~2,000 employees working in Hong Kong, Australia, and Ireland. The transport of cash put CIT employees at risk. As with other high risk UTCFS processes, an additional level of control is implemented through a UTCFS CIT Standard, developed interactively with the business units and evaluated against national and international standards. Requirements include specific management controls during firearms loading/unloading, rigorous operational protocols for cash movement, in-house vehicle designs, and routine performance audits of crews. The standard seeks to eliminate the risk inherent in possessing cash early by preventing robberies from occurring. Multi-step access controls on vehicles deter thieves as a car alarm deters a



vandal. The number of robberies is tracked as a leading indicator and safety processes are routinely modified as appropriate (Figure 33). Other examples of CIT improvements are included in Figures 34-35.

Large projects such as new product design or facility relocation receive review by all departments, including EHS, during a process called “Passport” where plans must be approved at various “gates” during development to ensure all business impacts are considered (Figure 36). UTCFS EHS has various strategies for partnering with Engineering to determine which aspects of new products must be evaluated during their design. In 2010, WHQ EHS, in conjunction with 3E company, created a tool called the Green Product Analyzer (GPA) that 3E uses commercially. UTCFS EHS staff were integral to the design of this tool, ensuring that it reflects relative environmental impact as accurately as possible. It uses MSDS information entered by clients and assigns criteria, enabling them to determine which products are greener than others. UTCFS is now piloting this tool to evaluate design alternatives for firefighting foams and powders.

Results of GPA analysis, as well as the status of other product design goals are reported once a quarter as part of the “Stewardship” edition of the UTCFS monthly sustainability report to 200 senior UTCFS leaders (Appendix 5. Included are 2015 goals regarding the elimination of UTC Materials of Concern, progress on new product design for sustainability, and regulatory compliance to directives such as the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and Restriction of Hazardous Substances (RoHS). WHQ EHS has been integral in UTCFS’ planning for compliance to the European REACH regulations. Recognizing the unique nature of our protein based firefighting foam, UTCFS EHS successfully lead a Substance Information Exchange Forum (SIEF) to support recognition that the protein was a naturally occurring polymer that has no negative environmental impact.

The acquisition of GE Security brought a strong group of engineers, resulting in a new design community for UTCFS products. This group regularly communicates with WHQ EHS to ensure concerns are addressed. A new research and development center is currently being constructed to LEED standards, with closed loop water testing. The project is managed by the former regional EHS lead for Global Fire Products (Figure 37). Any group developing the next generation of products must consider the EHS impact, meeting or exceeding the example set by existing products in the UTCFS mix. Design also considers the safety of employees during the manufacturing of products helping to eliminate the need for controls by designing potential hazards out of the process.

## EHSMS Element 6 – Education and Training

This element is a good example of the UTCFS philosophy of mandating the “what” and “why”, while enabling each unique business to determine “how” the requirements are implemented. Each organization assesses required EHS skills at all levels, as well as the risks and requirements of their jobs, to develop and execute a training plan accordingly. As with other programs, WHQ facilitates the sharing of ideas and information between similar businesses to create groups of similarly minded individuals working together on a customized strategy. The assessment includes which training must be given to whom and the method for assessing training effectiveness. On-line training may involve a test at the end to ensure concepts have been remembered and understood. Effectiveness is also assessed during risk assessments, incident investigations, inspections and audits, where repeat findings, such as placing waste in the wrong containers, may indicate a gap in training effectiveness.

EHS training is delivered to all levels of the workforce. It has also been integrated into the on-line business ethics training system (Figure 38). There are four training modules, modeled after our 2-day MELT classes mentioned in section II. They describe various aspects of the EHSMS and present UTCFS’ performance to EHS objectives.

An assessment of training needs by job is an important part of our EHS process, but a few types of training are considered essential and mandated globally by UTCFS WHQ. This includes training for high risk drivers and suppression system installation and service. Completion of this training is tracked as a leading indicator to prevent potentially fatal or serious events.

Individual businesses also track their own leading indicators, tailored to their own operations. One example is our monitoring and response business in South Africa. These employees are armed and respond to customer alarms, where they encounter potentially hazardous situations. Their approach to EHS is in line with the UTCFS strategies, like hazard recognition, for less unique situations. The business has devised multiple programs to educate employees on hazards they might be exposed to and which responses will help them manage risk. Scenario training, customer site risk assessments, and standard paths of action specialized to different response situations are a few examples (Figures 39). To keep employees safe, indicators must extend beyond behavior to target environmental changes that enhance risk. South Africa has created a set of leading indicators consistent with their operations which include operational coverage of staff and number of shots fired – regardless of source

or outcome. These indicators are tracked monthly by the local and regional operations team as well as the UTCFS VP of EHS (Figure 40).

#### EHSMS Element 7 – Communications

UTCFS operations establish methods to communicate EHS issues and information both internally and externally. Annual communication plans include subjects, intended audience (customers, employees, supplier, community, etc.) and frequency (Figure 41). They include a method for two way communications between interested stakeholders and management.

Communication was essential during the rapid integration of GE Security last year. An example is the matrix distributed by WHQ EHS that maps the GE Health and Safety and Environmental frameworks to the UTCFS EHSMS and high risk standards (Figure 42).

Businesses tailor communication to the characteristics of their workforce, designing strategies with their involvement. Some common methods are used throughout UTCFS. At factories, “town hall” style meetings allow local management to give employees EHS progress updates, such as audit scores or incident investigation results, along with other business metrics. Communication in service and installation businesses is difficult with most employees working alone, only visiting the branch office about once a month. In these cases, EHS topics can be included with paycheck distribution, or on the agenda for their monthly gatherings at the branch. UTCFS is working to integrate EHS communication into daily business related communication. An example is the integration of the S.A.F.E. process into iService software on employees’ handheld devices (Figure 27). A variety of effective communication strategies use information technology, such as the MSDS and emergency evacuation LCD touch screens at the GE Security location in Lincolnton, NC (Figure 43). Many service organizations distribute EHS handbooks to facilitate EHS communications with employees and contractors working alone. Key EHS information is included for them to consult when needed (Figure 44).

WHQ utilizes information technology to facilitate effective communication globally. The internal UTCFS website includes a link to our EHS page, as well as ~30 articles a year highlighting EHS topics and best practices in the business. Each year, 51 weekly safety tips, as well as several periodic environmental “spotlights” are published for employee education. These are often redistributed through local businesses by other means where employees may not have regular access to the website. Each one includes a method for gathering feedback

to EHS via Communications (Figure 45). Performance updates are disseminated throughout the organizations through our EHS managers. UTCFS' Vice-President of EHS reviews progress in the introduction letter to each monthly sustainability report. She also sends individual updates to the business unit presidents on their results and emerging issues (Appendix 6).

EHS messages are also interwoven through other functions, including quality, supply management, and engineering. When WHQ quality personnel plan to visit a site for an ACE assessment, they regularly request pre-visit information from EHS, as well as offering to follow-up on any concerns EHS may have that must be verified through local inspection. Conversely, when EHS conducts a gap assessment or assurance review, an ACE EHS criteria checklist is included in the executive summary, communicating the operations' status in implementing EHS requirements included in the ACE criteria that are essential for sites to achieve the next level of ACE certification (Appendix 15). In addition, the quality department receives quarterly updates from EHS on site progress to targets, which helps them determine if any sites are currently unable to achieve a certification before they visit for an assessment (Figure 46).

Safety First campaigns are distributed in conjunction with the Communications teams at WHQ and world-wide. The original Safety First campaign focused on educating our global work force on the Cardinal Rules. Subsequent campaigns have focused on trends in injury data, designed to educate employees on preventive measures they can take (Figure 47). These include Slip, Trip and Fall, Hazard recognition through the S.A.F.E. process, Motor Vehicle Safety, Ergonomics, and other booster campaigns reinforcing previous lessons, such as one distributed in February 2010 reviewing hazard recognition and safe driving techniques (Appendix 18) includes an excerpt of this campaign).

#### EHSMS Element 8 – Rules and Procedures

Each operation establishes EHS rules and procedures at all levels, which are integrated as applicable into the work instructions for review with employees. Violations of EHS rules and procedures are treated in the same fashion as those of other company rules and procedures.

UTCFS deployed 5 UTC Cardinal Rules (Appendix 10) and UTCFS specific Cardinal Rules for our own unique risks(Appendix 11). Cardinal Rules are meant to bring an extra level of diligence to employee awareness because of the risks they represent. Violations of Cardinal Rules, such as leaving compressed gas cylinders

unsecured or working at heights without company-provided fall protection, are treated more severely than violations of other rules. Injuries resulting from violation are identified via the on-line incident reporting module (Figure 48).

#### EHSMS Element 9 – Inspection and Audits

Each business implements an inspection, audit, and corrective and preventive action program. Inspections evaluate relevant physical conditions, acts or omissions of employees and other affected people in relation to EHS hazards, risks, legal EHS requirements and UTCFS requirements. They are conducted by employees, supervisors and EHS staff as appropriate.

The effectiveness of inspections is one of the items evaluated by the audits, which are performed by business leaders, line management and EHS professionals. Business leaders and line managers perform routine audits of the activities for which they are responsible. Another level of audit is conducted by EHS resources, ranging from site visit audits to more formal processes. Lastly, annual self-evaluations of the overall EHS program are required by Element 12 – Program Evaluation, described later in this section.

Additional audits are required globally by WHQ as applicable for significant risks. The UTCFS Gaseous Suppression Systems Standard was developed in conjunction with the field operations team to ensure that our installation and service businesses properly control the risk of stored energy. It has been deployed in manufacturing, construction, installation, modernization and service sites worldwide. The standard requires hands on practical training, for employees and contractors, followed by an annual refresher course. WHQ EHS created portable, on-line training modules in multiple languages that can be used on a job-site or in a class room. The standard and training seek to eliminate events by enabling employees to understand effective controls, and when and where they should be used. To date ~1,600 field technicians and over 360 contractors have received the training (Figure 15). The standard outlines cardinal rules, and requires regular audits. A field audit tool – the High Risk Control Evaluation - was developed internally to assess compliance with the standard. A minimum of four audits are required quarterly for each business that performs work on these systems. Over 1,800 audits have been conducted by employees and contractors since program implementation in early 2009. Completion is tracked as a UTCFS leading indicator and results are used to refine the program (Figure x). This serves as a useful

supplement to traditional behavior based systems. The tools we have developed and methodology for targeted intervention in high risk operations can have broad utility across other industries.

Independent evaluations by parties external to an organization ensure adequate implementation of the EHSMS and control of hazards. After an organization is acquired, progress on EHSMS implementation is evaluated objectively through a UTCFS gap assessment. For a large acquisition, the gap assessment schedule is prioritized by the risk and maturity of operations. The assessment is conducted by a regional EHS lead and a team of other EHS professionals, often one from WHQ. The team reviews the entire EHS program so the organization understands their strengths and weaknesses, focusing action on major program gaps.

Approximately a year after the gap assessment, and every five years thereafter, an organization receives an Assurance Review, a scored second party audit. The process is standard among all UTC-owned companies with a perfect score being 100%. UTCFS has improved average Assurance Review scores every year since the first review was conducted in 2005 (Figure 49) as our company has evolved from many individual businesses with different systems to one cohesive whole. Our integration process is rapid with EHS values serving as a cornerstone for business improvement.

#### EHSMS Element 10 – Incident Investigation

We must continuously eliminate hazards from our jobs to prevent injuries. To this end, we learn from all incidents to leverage the experience and apply root cause corrective actions throughout the company. The UTCFS Life Safety standard is an example, developed after a fire in Bangalore, India nearly resulted in fatalities due to inadequate site egress – only minor injuries occurred (Figure 50). UTCFS evaluated existing national and international guidelines and extracted key elements to be evaluated and deployed worldwide. Any site or acquisition considered for inclusion in the UTCFS portfolio must be evaluated against the standard and provisions provided for required retrofits.

Fatality and Serious Injury / Incident Investigation Reporting and Serious Environmental Incident Reporting (UTC/UTCFS policies) require special protocols for initial reports, investigations, senior management reviews, and corrective actions. UTCFS has successfully reduced the occurrence of fatalities and serious injuries by focusing on major risks in our business – armed response, machinery, and motor vehicles. Our evaluation

showed that gunshots, motor vehicle accidents, and amputations were the main causes; specific programs were developed to control those risks (Appendix 17).

Unfortunately, in 2010 UTCFS experienced three fatalities in our highest risk businesses – two shootings and one motor vehicle accident related to criminal pursuit. In 2011 there have been no employee fatalities. Every fatality is followed by a rigorous incident investigation and review. The managing director of the operation travels to WHQ in Farmington, CT for a review of the investigation and corrective actions with the UTCFS President and the President, UTC Commercial Companies. Relentless root cause analysis is applied to create robust corrective actions that change a fundamental element of the business. Examples of prior corrective actions would include upgrading bullet proof vests and new customer risk assessments. This ensures that the employee's coworkers are further protected by lessons learned from the incident. Figures 51-53 present process changing corrective actions implemented after the 2010 events. In response to the Australian Chubb Cash in Transit fatality last year, the initiative to implement bullet proof vests in the business was accelerated through negotiations with the union. Less than a year after the event, 100% of the armored vehicle operators are wearing personal body armor – Chubb is now the only company in the country requiring use of this PPE. Coupling these controls with innovative scenario training, our business is committed to setting the industry standard for safety.

As a life safety and security company we are focused on mistake-proofing processes to prevent hazardous events for our customers and internally. To help avoid these incidents, UTCFS businesses are required to report and investigate less serious injuries and near misses. Incidents are reported into the UTC EHS Reporting System (EHSRS) where root causes can be identified and corrective actions tracked to closure. Senior UTCFS EHS management reviews most potentially fatal or serious incidents (PFSI), requiring additional corrective actions if the operation has not effectively addressed root cause. To ensure a more consistent process, specific criteria were developed and outlined in a guidance document communicated to global EHS personnel (Appendix 18). These incidents are marked as a potential serious injury or, if no injury occurred, a serious near miss in the EHSRS. Monthly status reports are sent to responsible EHS contacts to ensure closure of all corrective actions and a standard review template is given to organizations required to review their PFSIs with WHQ EHS. Trending of PFSIs helps WHQ to focus on topics that have a higher potential of leading to a fatality or serious injury (Figure 54).

### EHSMS Element 11 – Documents and Record Management

Operations develop a system for creating, distributing, controlling and managing EHS documents, including a record retention schedule where required. Version control is strictly managed. For global documents, the most current revisions are posted by WHQ on an internal website. Several of our business units, such as Australasia and Americas, also maintain websites for quick access to their EHS documents (Figure 55). The site level document control processes are often linked directly to the quality system utilized by the local business.

### EHSMS Element 12 – Program Evaluation

Each operation conducts a comprehensive internal program evaluation annually prior to the business planning cycle. It is a self-assessment of all EHS leading and lagging indicators, implementation status of the EHSMS, and compliance to legal obligations and company requirements. Corrective actions to address gaps are incorporated along with hazard risk assessment, incident investigation, and audit and inspection results into the annual EHS plans, which are rolled up into the plans for the seven business units described in section II. UTCFS WHQ requires that the UTC Assurance Review audit protocol is used for program evaluations so the results can be tracked in the UTC EHSRS. GE Security, our most recent acquisition, used this tool to assess compliance to the UTCFS requirements, and assist them in creating their integration plans.

### EHS in Action

Employee engagement is key to injury and pollution prevention. Employee engagement occurs at the global level through corporate programs such as EHS IDEA, but local programs are equally valuable. Figures 56-63 illustrate existing global and local programs focused on employee engagement, health, and wellness. Other corporate-wide wellness programs begun this year include targets for quiet, clean, and tobacco free work places, developed by UTC, but requiring UTCFS to implement creative solutions adapted to the unique risks of our operations. Details follow in the next section.

### ***Section IV: Performance Measurements and Information Management***

UTCFS tracks numerous measurements, essential to drive development of programs, indicate high risk trends, and track progress. Lagging indicators are tied to the UTCFS EHS goals (described in Appendix 19 with progress discussed in section V). New targets in place for 2011-2015 include initiatives to reduce noise exposure below an 8 hour time-weighted average of 85 decibels, reduce chemical exposures to below the



occupational limits, and eliminate tobacco products used on our properties. UTCFS has developed a plan to meet these targets by assessing processes in multiple ways to determine the most cost effective solutions, benefitting employees and the company. WHQ assessed the company as a whole so specific solutions can be applied to similar processes across locations, enabling businesses to work together on a plan, rather than each having to devise solutions independently. The plan was repeatedly revised through 2010 as more creative, lower cost options were identified. To meet annual targets, UTCFS is addressing technically simple, low cost options globally, while also specifically targeting operations with the most impact (Figure 64). Additional UTCFS 2011-2015 EHS Targets include safety, compliance, environment, supplier, and products (Figure 65).

A set of predictive leading indicators applicable to the entire company is tracked globally by WHQ (Appendix 20), while individual organizations often have their own measures tied to their business risk (Figures 66-67). Some are published quarterly as part of the UTCFS sustainability report, while others, such as motor vehicle collisions, are communicated at various intervals with other data pertaining to the same topic.

The on-line UTC EHS Reporting System (EHSRS) mentioned earlier is utilized to track most performance measurements. All data is rigorously reviewed by WHQ at the completion of a report period. UTC created reporting requirements documents for the metrics tracked at their level and UTCFS developed detailed instruction documents to train local contacts on data tracking and entry. All data reported in the on-line EHSRS can be accessed by our operations for their own location, while business unit EHS leads and WHQ have access to a wider range of locations for global review.

Data analysis occurs at all levels to accomplish various objectives. The leading indicators help WHQ to plan global programs for injury and pollution prevention. For example, the completion and performance of businesses on the suppression system high risk control evaluations determines which locations are not following the UTCFS standard (Figure 68). Another predictive indicator, motor vehicle replacements, helps track compliance to the motor vehicle procurement standard and the likelihood of an associated increase in fleet emissions if exceptions to the efficiency improvement requirements are requested (Figure 69). Collecting data and deploying the standard is accomplished via close cooperation between WHQ, regional, and local EHS and supply management teams. WHQ EHS is the department that manages a detailed global vehicle inventory, working with local fleet managers, leasing companies, and sometimes regional procurement directors every

quarter to ensure data gathered for fuel use and collisions is accurate. As discussed in section II, EHS often identifies cost savings opportunities related to the fleet because global and regional trends can be identified using the complete inventory that would otherwise be invisible to WHQ since fleet management occurs at the regional or local level only (Figure 70).

Most importantly, global injury prevention and reduction strategies are developed through data analysis by WHQ. Initial data review in 2005 and 2006 illustrated the need for return to work programs due to the high ratio of lost day versus recordable cases. Safety First programs were also developed as a result of injury data analysis. Slips and falls were common in the security operations due to the guards having to chase perpetrators, while cuts and lacerations were common in the manufacturing operations where large knives were still being used to cut firefighting hose. Specific organizations were targeted if there was a prevalence of one type of injury negatively impacting UTCFS performance overall. Extinguisher servicing in France was requiring employees to work in awkward positions. A cart designed to hold the extinguishers has helped reduce that risk (Appendix 21). A new 2011 initiative is the “Focus on Fractures.” Injury data shows that significant fractures have not decreased at the same rate as other injury types over the past few years. When severe, they become serious injuries. As we reduce these fractures we will reduce the risk of life altering injuries (Figure 71). This is consistent with our approach to advance to predictive indicators, not lagging ones. EHS tracks employee behaviors that could lead to potentially fatal or serious incidents when associated cardinal rule violations are indicated as part of the incident report entered into the EHSRS (Figure 48). The tracking of motor vehicle collisions is also an indicator of fracture risk and fatalities because many of them occur in motor vehicle accidents.

Analysis of other data has also resulted in improvement actions over the years. In 2005, the number of technically competent EHS staff in the Chubb and Kidde operations was inadequate to implement effective programs. Detailed analysis resulted in the addition of EHS staff and a decrease in the EHS FTE to employee ratio of 60 percent over 4 years. In these 6 years, EHS has gone from a secondary activity to a foundation value of the organization.

Environmental initiatives are often the result of data analysis to determine which projects will have the greatest impact on UTCFS overall. Upgrades to a powder collection system at Kidde Matamoros, valve and cylinder testing controls at Kidde Fenwal, and foam manufacturing waste reuse at Kidde Products were all the

result of company wide recognition of importance to the UTCFS environmental footprint (discussed further in section V). Regional greenhouse gas emissions goals were also developed in 2008 because at that point the contributions of all business regions to this metric were balanced.

All data, including progress to targets, is published in reports to both senior management and global EHS contacts on either a monthly, quarterly, or semi-annual basis, depending on the measurement). In 2011, UTCFS began publishing integrated sustainability reports covering three different topics in sequence – people, process, and stewardship. The objective is to help employees understand sustainability by describing the various impacts of UTCFS as a whole. They are distributed through e-mail to 200 key management and EHS contacts, and posted on the UTCFS home page for access by any UTCFS employee. Further distribution is accomplished through the regional and local EHS leads who analyze the data to distribute their own region-specific reports. Local organizations use the data to track progress to objectives and develop prevention programs. Employees access information through a variety of ways depending on the organization. As mentioned in section III, EHS metrics are posted with other operational metrics on the ACE Control Panels. Many companies have EHS boards posted on manufacturing floors, or in branch offices, where employees can review the progress of UTCFS, and their own businesses (Figure 72).

Externally, we benchmark on a case by case basis depending on definitions used by other companies. Benchmarking comparable companies is a continuous process for us to test our programs and identify opportunities for improvement. Additionally, in many high risk regions UTCFS is working with competitors to benchmark good practices and raise standards. UTCFS researches metrics tracked by other companies in our industry, such as Tyco and Honeywell, to ensure consistency in comparison of data, and to determine our progress toward best in class performance (Figures 73-74).

As we continue on our journey to have unmatched EHS results, we regularly reflect on our mission as a life safety company to propel us beyond established benchmarks. We must continue to operate beyond lagging indicators with activities designed to eliminate exposure to hazards before they cause an incident rather than learning in the aftermath of a tragedy. Concurrently, prevention of lower risks is important as well; even minor strains, contusions, and lacerations have a negative impact on our employees' quality of life and should not occur.

This mindset permeates the global organization and is applied at the local level through leading indicators (Figures 66-67).

### ***Section V: EHS Results***

As a new business segment within UTC, UTCFS was brought into the corporate goal program with a baseline year of 2006. UTCFS began tracking safety performance (incidents meeting the OSHA definitions and hours worked) with its formation in 2005 after the acquisition of Kidde (Chubb had been tracking since its acquisition in 2003). Because of the complexity in tracking and reporting, careful implementation of the environmental metrics occurred after development of resources, such as detailed training, in late 2005. Therefore, 2006 is the first full year on record of accurate and detailed environmental metrics. Performance to the 2010 targets (Figure 75) for environmental metrics is indicated as a percent reduction since 2006, however continuous performance in the safety metrics is reflected since 2005.

UTCFS injury reduction programs have driven such significant improvement in our safety metrics that we have exceeded all targets. From 2005-2010, the number of fatalities and serious injuries decreased by 75 percent. We continue to strive to eliminate risks to our employees through detailed review of these incidents, as well as potentially fatal or serious incidents. LDIR decreased by 96 percent and TRIR by 85 percent from 2005-2010 (Figure 76). This rate of reduction (on average ~75 percent and ~60 percent year over year for LDIR and TRIR respectively) reflects UTCFS' ability to rapidly integrate new organizations while progressing and developing existing programs in a drive to be best in class. GE Security injury and environmental impact data were included in the UTCFS totals by January, only 10 months after the acquisition. By reviewing the nature, source, and occurrence of an injury, we create highly effective programs focused on risk. Historically, most of the total recordable injuries are associated with slip, trip, and falls and ergonomic issues (Figure 77). The 2010 rates of 0.07 (LDIR) and 0.38 (TRIR) mirror best in class performance in our industries. For Q1 2011, UTCFS rates are 0.06 (LDIR) and 0.23. Our approach is to identify problems and/or opportunities, create solutions consistent with business processes and driven by a strong set of performance indicators.

UTCFS has attained substantial absolute reductions in its environmental metrics in relation to the 2006 baseline, exceeding the target values for 2010 (Figure 78) including reductions of:

- 27% percent in Total industrial process waste

- 40% in Non-recycled industrial process waste
- 20% in greenhouse gas emissions
- 74% in air emissions
- 36% in water consumption

Improvements are not normalized to sales or production for any metric. The UTCFS strategy for meeting the targets has centered on sharing solutions internally between similar companies, targeting high impact locations (see section IV for examples) and designing innovative solutions to address unconventional materials.

Reductions in greenhouse gas (GHG) emissions have come from various sources and resulted in significant cost savings for the company. Approximately half the emissions result from fleet vehicles, where efficiency improvements have reduced environmental impact while providing savings in fuel costs. Operational efficiencies are being realized at the facilities. Changes in manufacturing processes and testing protocols, as well as upgrades to building systems, have reduced UTCFS GHG emissions by ~6 percent. Most importantly, our operations are expected to identify ways to reduce their environmental footprint and become more efficient at the same time.

Integrating EHS objectives into building design and operations has been crucial in our efforts to control environmental risk. Lessons learned from powder manufacturing in North Carolina were applied in the design of similar operations in Kidde Matamoros, a powder extinguisher manufacturer in Mexico. Design modifications included properly guarded machinery, vacuum system upgrades and fire extinguisher powder reuse. These initiatives resulted in a 99 percent decrease in water contaminated with powder waste and 95 percent decrease in powder waste (Figure 79). The process for eliminating a regulated chemical, di-octyl phthalate, in firefighting hose at the Eau et Feu operation in France was shared with the operation in the UK to improve their own product.

Waste elimination and re-use opportunities have contributed to the significant reductions in total and non-recycled industrial process waste, as well as cost savings associated with both disposal, and procurement of raw material. Our approach is to identify local companies that can use our material as input into their products. This not only reduces our environmental footprint but promotes regional economic and environmental sustainability. However we continue to search for opportunities to move these materials out of the non-recycled waste stream. Excess fire hose at Kidde Brazil is utilized as a furniture support structure by a local manufacturer (Figure 80).

Kidde Firefighting in Angier, NC has begun recycling their scrap hose waste to industrial netting. Kidde Products in Bentham, England began composting a waste from fire foam manufacturing (filter cake) in January 2011. This success was the culmination of several years' effort, both in identifying an appropriate use and working with regulators to ensure they can rely on the certification received upon arrival of the raw material into England to also certify the filter cake. Multiple samples were analyzed to determine the characteristics of the material, and components that might be useful for various applications, including composting, rendering, and other unique uses evaluated. Annually, the project will divert 4 million pounds from landfills, and decrease disposal costs by 50% (Figure 81). Most importantly, a sustainable local use has been found for our largest industrial by-product.

Chubb Fire, an extinguisher installation and service company in the United Kingdom, has set up a business model based on its willingness to take back any brand of fire extinguisher from their customers for recycling and disposal. The business was developed in response to the customer's desire to act responsibly. The parts are recycled and reused where possible in an extinguisher refurbishing operation at the location. This process won the 2006 UK Business Commitment to the Environment Award (Figure 82).

Consistency in tracking and reporting of EHS data allows comparison of improvements across UTCFS and externally. The World Resource Institute – World Business Council for Sustainable Development (WRI-WBCSD) GHG Protocol is used for applicable comparison to other businesses. OSHA reporting rules are implemented globally, and strict reporting requirements laid out by UTC are followed for the remaining metrics. Waste definitions are based on US Environmental Protection Agency (EPA) guidelines. This standardization allows accurate reporting so focus can remain on continuous improvement, not data quality. By focusing on all aspects of our environmental footprint we have been able to engage both the manufacturing and service facets of our business on the importance of environmental reduction and the impact we can have at work and at home.

#### ***Section VI: Linkage Between EHS and Business Performance***

As a result of this relentless focus on risk identification and elimination through assessment, prevention and control strategies UTCFS continues to exceed annual targets established in 2006. This performance has been achieved in one of the most challenging globally economies. Like our EHS performance, financial results have also maintained strong performance. In 2003 return on sales was 4.5 percent compared to 12 percent today while revenue has expanded from \$2.5 billion to \$6.5 billion (Figure 3).

Considering that we are in the business of life safety, we could not grow without strong internal controls and understanding around EHS. We provide fire protection and safety systems that must perform when called to action. We must install and maintain these systems in a safe and environmentally sound manner. Our customers have acknowledged our success in this objective (Figure 83).

Chubb Australia is the first business in our industry to win the Australian Department of Commerce WorkSafe Platinum Award twice – in 2006 and 2009. The certification is good for three years, when another audit is performed to re-qualify. The rigorous week-long audit evaluates compliance to Australian requirements. The recognition is very difficult to obtain and has a result it has increased our visibility as a reputable contractor for work, particularly in the mining industry.

Annual audits conducted by British Petroleum (BP) also review both national and state/territory EHS legislation and BP requirements. Chubb Australia has been audited for the past five years and averaged 96% in 2010, a significant improvement from 2009 where we average an 83%. In 2010, our South Africa Chubb Fire business scored 100 percent on a BP audit.

Business integration is evident in our organizations' relationships with customers. Chubb Australia sponsors the Annual Surface Mine Emergency Response competition, which tests the capability of mine emergency response teams, as well as highlight the mining industry's focus on safety. EHS is an important element of the company's overview packet for customers (Figure 84). Partnerships with individual companies are important to ensure they continue doing business with us (Appendix 22). Recognizing the need for on-site partnership, Australia has created a position for an EHS mining sector lead which crosscuts all business functions.

UTCFS businesses belong to a number of organizations that are routinely consulted by customers to assess the EHS programs of their contractors. Customer requirements have begun to play a large role in the corporate qualifications. In many of UTCFS' companies have been requested to participate in certification schemes and contractor reviews. Strong EHS performance is as important to these customers as it is to UTCFS. Our EHS professionals are contributing to overall site safety by ensuring audit performance and participating in pre-bid site visits. Most of the certification schemes require annual audits, while some customers require them monthly (Figure 85).

The integration of EHS into all facets of business at UTCFS has resulted in a seamless understanding that it is integral to success. Numerous examples of this have been described throughout other sections of this narrative, including the application of the principles of Achieving Competitive Excellence (ACE) – the UTC operating system - and the incorporation of EHS targets into the requirements for certification. In our service operations, whether it be guarding, security or fire, the sales personnel conduct site risk assessments during the bid process to ensure the business is aware of what hazards the employees may encounter if the job is contracted. EHS has also begun to educate them on our program as well. For example, UK Chubb Fire & Security has developed a short presentation to help sales personnel speak to the UTCFS EHS program when meeting with customers. Meeting customer requirements for addressing on-site EHS hazards, such as intrinsically safe equipment or specialized clothing, is often a determinant for whether or not partnerships exist. Customer questionnaires often contain questions regarding various aspects of the company EHS program and our responses are considered along with other business characteristics.

The UTCFS EHS Management System facilitates the interweaving of EHS into business functions by standardizing specific EHS requirements for various parts of the business. However, the business must embrace these requirements and apply them effectively for the system to work. It is generally understood by departments such as engineering, operations, and supply chain that the EHS department's expertise is essential in planning and execution of business objectives, as demonstrated by initiatives described throughout this narrative. Supply Management and Engineering work closely with EHS representatives to achieve the product and supplier EHS goals. The involvement is ensured through both formal processes and an informal partnership between individuals from WHQ down through to the local EHS managers, their management, and their employees. EHS leads, both local and regional, report directly to their business unit leader to ensure that EHS supports business needs, while also being incorporated into decisions along with other functions.

### ***Section VII: Other Factors***

In recent years, companies have become more global as communication channels develop and markets grow in countries like China and India. The challenges inherent in a global, diversified business are similar, regardless of the industry. UTCFS has proven that superior performance in both EHS and profitability can be achieved through cross-functional cooperation, an understanding of the differing needs of subsidiaries, and



programs designed to eliminate the risk of adverse events by integrating prevention programs at the early stages of process development.

Effective acquisition integration is also an essential element to UTCFS' success. Our longevity as a company depends on our ability to do business as one cohesive entity – preserving the success that our various companies enjoyed before their acquisition, while helping them adapt their operations to mirror the high level operating requirements that tie our many companies together.

Today there are standardized processes and a core EHS program to ensure that rigorous integration targets are met. Although a strong integration process has developed over the past few years, the dynamic nature of UTCFS will continue to require reinvention of our global programs. World-wide teams sharing information and experience help support developing systems at acquisitions, both small and large. A group of highly experienced EHS and suppression system professionals has facilitated program implementation at our sites in India. Individuals from WHQ, other UTCFS operations, and field installation specialists mitigate risks at job sites and create the platform for long term EHS and field improvements.

A strong international EHS team is also regularly called upon to assist new acquisitions. For example, the EHS manager for Fyrnetics in China, provides guidance to new EHS professionals at GST, sharing programs and helping identify risks. The prevalence of partnerships such as these in UTCFS operations is a strength that will enable us to continuously improve, as it has the past 6 years. The involvement of all levels of the workforce creates a culture where EHS activities are encouraged and accepted as a core value.

### ***Section VIII: Conclusion and Path Forward***

UTC Fire & Security is committed to keeping our customers safe through the fire prevention and security services we provide. We are protecting the environment through conservation in our own operations and the development of products with smaller environmental footprints. We ensure our employees are safe by developing creative programs to eliminate risk and requiring all employees to maintain the highest job site safety standards. And finally we work to keep our communities safe by supporting key public service initiatives that raise awareness about fire risks, support firefighters and improve the lives of fire victims and their families.

We will continue to eliminate risk from our business portfolio through EHS leadership, open lines of communication with our customers and delivering sustainable products and services that reduce risk to people and

the environment. Our business will continue to eliminate internal risk by developing sound engineering solutions during the design phases of our product developments with gated functional leadership reviews through the use of our ACE tools. EHS programs will support community outreach and employee involvement.

EHS is a fundamental element of our culture and will remain a core building block in any process within UTCFS. We will achieve financial benefits to the organization through EHS programs that drive elimination of waste, emissions, resource use and employee exposure and injuries. Our commitment to illustrate unmatched EHS performance by consistently implementing our control strategies will allow us to maintain and improve on our current performance trends. As a life safety company, this is the cornerstone of what we do.