



**U.S. Chemical Safety and
Hazard Investigation Board**

STRATEGIC PLAN

Fiscal Years 2007–2012

DRAFT

BACKGROUND AND SUMMARY OF STRATEGIC PLAN

The U.S. Chemical Safety and Hazard Investigation Board (CSB) is an independent, non-regulatory, federal agency with a mission to investigate chemical accidents and to recommend actions to prevent future accidents -- protecting workers, the public, and the environment. The agency was authorized by Congress in the Clean Air Act Amendments of 1990 and was first funded in 1997.

When a major chemical accident occurs at a fixed industrial facility, the CSB deploys a multi-disciplinary team of investigators to the site. The investigators interview witnesses, examine and document the accident scene, and collect physical and other evidence. After a detailed analysis of the circumstances of the accident, investigators prepare a report that contains findings, root causes, and safety recommendations.

Each draft report is presented to the CSB Board, which consists of up to five members appointed by the President and confirmed by the U.S. Senate. Reports and recommendations are only issued by a majority vote of the board members.

In addition to investigation reports, the CSB produces shorter written products such as safety bulletins and case studies. The CSB is also authorized to conduct broader investigations of chemical accident hazards – whether or not an accident has already occurred. Safety studies examining hazards that are widespread throughout the nation are an important means of accomplishing the mission.

Most of the CSB's written products include a number of specific, measurable safety recommendations designed to prevent future accidents. The CSB makes recommendations to local, state, and federal agencies, such as the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA). The EPA and OSHA regulate the safety of the industries that manufacture and use chemicals. The CSB also makes recommendations to standard-setting bodies, trade associations, labor unions, corporations, and other organizations.

To accomplish its mission, the CSB carefully tracks the progress of recipients in implementing the recommended actions. Ultimately, the majority of the Board must vote to designate a recommendation as closed based on "acceptable" or "unacceptable" actions by the recipient.

Over the past three years, the agency has established a dedicated recommendations office to work with recipients to secure the successful closure of recommendations. The new office has greatly increased the closure rate for CSB recommendations.

The CSB's mission is also dependent upon widespread understanding of the causes of chemical accidents, as revealed by our investigations. In order to broadly disseminate its findings throughout

the U.S. and overseas, the CSB produces short outreach products and videos and conducts public meetings, news conferences, and roundtables. Board members contribute significant time and effort to public speaking and participation in safety events, conveying the CSB's messages, findings, and recommendations to broad and diverse audiences in the United States and other countries.

Finally, all the agency's success is dependent upon maintaining a highly productive staff – including many with significant technical expertise in the operation of the chemical industry – that is motivated, educated, and enthusiastic about our goals.

In this Strategic Plan, the CSB has established five strategic goals for the agency. The four mission goals focus on investigating chemical accidents, conducting safety studies, broadly disseminating agency findings, and successfully closing safety recommendations. A fifth enabling goal targets the development and retention of a high-performing workforce. The plan was completely revised in 2006, with a heightened emphasis on investigations, studies, recommendations, and outreach that have a higher potential to impact safety nationally. Each of the five long-term strategic goals includes key results that the agency hopes to accomplish over the next six years and key strategies to achieve those results. Each strategic goal also has specific metrics – yardsticks the agency will use to measure its progress.

Over the next six years, the CSB will diligently implement this Strategic Plan and will continue its vigorous efforts to protect workers, the public, and the environment from chemical accidents. The agency will develop Annual Performance Plans that include yearly targets on the road to implementing the five strategic goals. Each annual plan will have specific personnel and groups assigned to complete each action item, and the Board and senior staff will monitor overall progress. The CSB reports regularly on its activities to Congressional committees, members, and staff; the Office of Management and Budget (OMB); and the public.

The CSB Strategic Plan contains the following sections:

- Legislative mandate
- Elements of plan
- Key factors affecting goal achievement
- Relationships with other bureaus and agencies
- Program evaluations
- Consultations used to develop the plan

The CSB uses the Strategic Plan as a guide in setting priorities, allocating resources, and making day-to-day decisions. The plan is regularly examined and is updated every three years.

CHAIRMAN'S MESSAGE

The CSB's accident investigations have grown in the past five years in scope, quality, and value to the industrial community. Our reports have focused not only on the operational details of serious chemical accidents but have expanded to define the details of failed management systems. We are quickly moving to describe the impact of human factors as root or contributing causes of major accidents. Our investigations have naturally progressed to begin looking at the organizational culture which supports or undermines safety and at the lack of risk awareness that can lead to catastrophic accidents.

Certain organizational structures or behaviors can lead companies to become blind to certain risks. We have seen circumstances where management have been made aware of risks but did not put in place necessary precautions to prevent such risks from becoming reality.

The Columbia Accident Investigation Board identified organizational behaviors that raised the potential for the catastrophic accident at NASA. American industry has been learning from these insights. Leaders of many companies can benefit from the identification of risky organizational behaviors -- just as they can from the identification of chemical or engineering hazards which might exist at their facilities. The knowledge and the recognition of the consequences of such behaviors will lead to more effective prevention of catastrophic accidents.

CSB investigations will use the latest advances from the study of organizational culture and apply these concepts to investigations where feasible and appropriate. As part of our process of continuous improvement, moving into this area of investigation will benefit American industry and serve to protect its citizens from the potential and the reality of catastrophic industrial accidents.

The CSB has amassed more than 40 investigations that inform the public and American industry of hazards through reports, safety bulletins, and case studies. While these products have been well liked and widely distributed, recently the CSB has found that producing safety videos have filled a widespread need among industry and educators alike to emphasize the common hazards that can ultimately cause a catastrophe. The CSB will continue to explore means to report and distribute the lessons learned from our investigations in ways that fill the needs of the public and promote prevention of similar accidents elsewhere.

In that same light, we recognize that while each investigation contains important hazard information, taken as a body of work, the 40 investigations and those that will be done in the future comprise an important foundation for understanding and identifying common hazards. For example, our reports reveal that the frequent failure to recognize repeated abnormal situations and near-miss events as harbingers of more dangerous events to come. Overlooking such events is a common precursor to more serious accidents where people are killed and communities are disrupted. Poor process safety management is also a common element that we find in our investigations. Inadequate technical support and management blindness to risk is also a common

element when the whole body of work is reviewed. We also found that the chemical hazard information compiled by manufacturers and distributed to employees is often deficient, and this contributes to significant accidents. Our screening of incident data reveal that the great majority of accidents continue to occur among smaller businesses with limited safety and technical resources. In the coming years, the CSB will continue to review our body of work and use the findings to focus our prevention efforts in outreach and education.

Formal safety recommendations continue to be a primary means of causing individual companies to improve and address more global safety issues. The CSB recommendations will continue to focus on gaps in regulation and oversight as well as codes and standards used by industry to make safety improvements. We will continue our efforts to work in cooperation with agencies and organizations that promote safe practices through regulations, codes, and standards and to assist them where possible in securing adequate resources. Issuing, advancing, and closing recommendations remains an important core function of the CSB.

In order to drive the CSB toward greater value for the public, maintaining a superior work force is essential. The CSB is a highly efficient and effective agency. Our quality of work and the influence exerted within industry and the public is a testament to the dedication of the people of the CSB. As leadership grows within the organization, the CSB will continue to produce insightful, challenging and influential work to achieve its mission of promoting prevention in even greater measure in the next five years.

Carolyn W. Merritt
Chairman & Chief Executive Officer
September 2006

I. LEGISLATIVE MANDATE

The U.S. Chemical Safety and Hazard Investigation Board (CSB) was created under the Clean Air Act Amendments of 1990. The legislation created an independent safety board to investigate serious chemical accidents and to recommend measures to prevent future accidents.¹ Lawmakers modeled the CSB after the National Transportation Safety Board (NTSB), the respected federal agency that investigates transportation-related disasters. Like the NTSB, the CSB was given a separate and distinct mission from regulatory agencies, which conduct inspections after chemical accidents primarily to examine violations of existing rules. Instead, CSB accident investigations “determine the cause or causes of an accident whether or not those causes were in violation of any current and enforceable requirement.” [Senate Report No. 101-228 (1989)]

The Board’s primary statutory authority is to “investigate (or cause to be investigated), determine and report to the public in writing the facts, conditions, and circumstances and the cause or probable cause of any accidental release resulting in a fatality, serious injury, or substantial property damages.” Other significant duties include issuing periodic reports on chemical safety issues, conducting research and studies, and most importantly “recommending measures to reduce the likelihood or the consequences of accidental releases and proposing corrective steps to make chemical production, processing, handling and storage as safe and free from risk of injury as is possible.”

The Board has extensive information-gathering authorities, including the right to enter properties where chemical accidents have occurred, to gather and inspect relevant evidence and records, and to convene hearings and require the attendance and testimony of witnesses. The Board is authorized to establish procedural and administrative rules necessary for exercising its duties.

The Board conducts its statutory mission independent of direction from other executive branch agencies, and the Board’s recommendations, testimony, and budget requests must be provided concurrently to Congress and the executive branch. Board reports are not subject to judicial or executive branch review, and the Board’s conclusions, findings, and recommendations are not admissible as evidence in civil suits seeking damages. The CSB is governed by a Board of up to five members appointed by the president with the advice and consent of the Senate; members serve fixed terms of five years and may only be removed by the president for cause.

¹ The record before Congress in 1989 demonstrated that although many agencies shared an interest in chemical safety, “no agency of the United States Government was actively engaged in efforts to prevent chemical accidents . . .” [Senate Report No. 101-228 (1989); p. 143]. Congress saw the need to “improve the effectiveness of accident prevention programs and reduce the burden of duplicative requirements on regulated entities.” The chemical industry agreed and voiced its support “for a coordinated Federal approach to accident prevention and suggested that an agency like the Board might most effectively carry out that responsibility.”

II. ELEMENTS OF THE PLAN

CSB Mission

To investigate chemical accidents and hazards and recommend actions to protect workers, the public, and the environment

CSB Vision

The CSB's findings and recommendations are widely used to safeguard workplaces, communities, and the environment. Businesses that use chemicals operate more safely because they have accurate information on the causes of past accidents.

Goal 1

Select and complete accident investigations that recommend actions with a high potential for protecting workers, the public and the environment.

Key Results

- Deploy to accidents that score highly on selection criteria
- Produce written investigative products that contain significant new findings
- Where appropriate, issue significant new safety recommendations with a high potential for preventing future accidents
- Reduce time to complete investigation products

Key Strategies (Resources, Skills, and Technology Needed)

- Develop, revise and periodically review selection criteria and other tools necessary to improve and expedite investigations
- Incorporate new components into investigative analysis (e.g. human factors, safety culture, and organizational performance)
- Improve planning to tailor the scope, detail, and resources of investigations to the importance of the safety issues
- Develop and implement criteria for continuing or curtailing investigations
- Improve capacity for conducting industry surveys to define the extent of risks
- Identify potential recommendation targets and assess the magnitude of the safety issues at an early stage of the investigation
- Improve the monitoring of emerging chemical safety issues

Metrics

- Number of significant safety recommendations issued
- Cost and average duration of completed investigations
- Surveys of stakeholders on impact and significance of investigative products
- Adherence to incident selection criteria and scoping criteria

Discussion

Chemical accidents cause fatalities and injuries to workers and the public and produce extensive property damage and harm the environment. The CSB investigates major accidents to determine their root causes and recommends actions to prevent future accidents.

CSB has substantially increased the number of accident investigations it conducts each year. In FY 2002, the agency issued only four accident investigation reports. Four years later, in FY 2006, the agency expects to complete eight investigation reports.

However, the CSB only has the resources to conduct investigations of a small percentage of the chemical accidents that occur each year in the United States. In a 2006 report to Congress, the CSB noted that over a 12-month period, the agency screened some 645 chemical accidents, an average of almost two a day. The consequences of 18 of these accidents – including deaths, injuries, property damage, public impact, or environmental harm – were serious enough to rate “medium” to “high” priority in the agency’s scoring system for chemical accidents. The CSB only had sufficient personnel to deploy to seven accident sites during the same period, and only five investigations could be carried forward.²

During the period of this Strategic Plan, it is unlikely that the agency will be in position to investigate more than a small percentage of the accidents that occur around the country. To have an impact, it is important that the agency continues to focus its investigative resources on those cases that have the potential for helping to improve safety on a widespread basis.

The agency will always need to investigate catastrophic accidents of national significance. Fortunately such accidents are not common. An example is the CSB’s investigation of the 2005 refinery disaster in Texas City that killed 15 workers and injured approximately 180 others. Even before this investigation was completed, it commanded worldwide attention as the CSB publicized its preliminary findings and early recommendations through six news conferences, a major public meeting, and numerous speaking engagements around the country.

The CSB’s three urgent safety recommendations issued in 2005 from the Texas City investigation are already prompting major changes throughout the industry. For example, new policies are being implemented in the U.S. and overseas for placing temporary structures such as trailers away from hazardous areas of petrochemical facilities.

However, the majority of accidents that occur do not command national attention, and investigative recommendations from those accidents have more limited scope. Approximately 6% (24) of CSB’s recommendations have the potential to impact serious and widespread risks by affecting national regulations, important voluntary standards, or other activities of national significance. Another 32% could impact important risks in contexts such as large cities or major corporations. The remaining

² During this period, the explosion at the BP Texas City refinery, which killed 15 workers and injured approximately 180, required the lengthy deployment of the majority of the CSB investigative staff.

62% have focused on individual sites or smaller firms or have called on organizations to communicate CSB findings.

In smaller cases where significant national recommendations are not warranted, the CSB will focus on completing investigations quickly and efficiently and with a limited commitment of resources. The Board recognizes, however, that even smaller accidents can offer significant and important lessons for industry and will use the outreach program to publicize the findings from those cases. Often, it is only a few fortunate circumstances that differentiate between a smaller accident and a catastrophic one.

The keys to achieving Goal 1 include a highly disciplined use of the agency's selection criteria for accident deployments and – even more importantly – a careful scoping of resources and effort after the initial details of an accident are revealed.

CSB investigations continue to highlight the key role that organizational behavior and human factors play in causing major accidents. The study of human factors can range from examining the interface between humans and equipment to investigating how organizational and staffing decisions impact safety performance.

Almost all major U.S. chemical accidents involve hazards that are known among safety experts and have been previously described in the technical literature. Accident investigations from many sectors – including the manned space program and the nuclear energy sector – have focused on role of organizational safety culture in setting the stage for disasters.

To better address these issues, the CSB will include organizational and human factors components in its investigative analysis, alongside the existing rigorous technical analyses.

Baseline Statistics

During FY 2006, the agency expects to issue a total of eight investigation reports (two full investigations, four case studies, and two safety bulletins). During the period from 1998 to 2006, the CSB issued a total of 383 safety recommendations, of which approximately 36% addressed significant risks at the national, state, or large municipal or corporate level. The average duration of the last eight completed investigations has been 15 months, at an average total cost of \$159,000.³

During the period from July 2004 to June 2005, the agency initiated five accident investigations; all five scored at least “medium” in the agency's selection criteria. During the same period, resource constraints prevented the agency from deploying investigators to eight other accidents that scored “medium” or above.

³ Includes staff compensation allocated to each investigation. Excludes BP Texas City Refinery investigation, which remains open at the time of writing, with a cost to date of over \$2 million.

Goal 2

Select and complete safety studies that recommend actions with a high potential for protecting workers, the public and the environment.

Key Results

- Produce safety studies that contain significant safety recommendations

Key Strategies (Resources, Skills, and Technology Needed)

- Subject to availability of resources, establish a studies team to improve the quality, efficiency and scientific rigor of the research and studies process
- Expand staff research skills related to public policy, law, statistics, and accident epidemiology
- Develop and implement a written protocol for selecting and conducting safety studies
- Explore appropriate partnerships with other government agencies and national research organizations for conducting studies
- Organize conferences with key stakeholders to identify significant chemical safety issues
- Improve capacity for conducting research surveys in support of the safety studies

Metrics

- Number of significant safety recommendations issued
- Cost and average duration of completed studies
- Surveys of stakeholders on impact and significance of safety studies
- Development and adherence to safety studies protocol

Discussion

The Clean Air Act Amendments of 1990 authorize the agency “to conduct research and studies with respect to the potential for accidental releases, whether or not an accidental release has occurred, where there is evidence which indicates the presence of a potential hazard or hazards.”

Conducting safety studies is an important aspect of the CSB’s mission to prevent accidents. Investigating the root causes of an individual accident, while obviously important, sometimes fails to reveal how prevalent a hazard is around the nation. Recommendations from an individual accident investigation often focus on eliminating specific root causes rather than addressing broader national problems.

From 1998 to 2006, the agency conducted five safety studies that examined widespread hazards in U.S. industry, such as reactive chemicals, combustible dust, and dangers of nitrogen asphyxiation. Collectively, these hazards were responsible for more than 300 deaths, numerous injuries, and substantial property and environmental damage. The studies present recommendations for national actions to help save lives by preventing similar accidents in the future.

The CSB has lacked a specialized staff for conducting safety studies and has instead opted to temporarily reassign accident investigators to perform the work. Although investigators have approached this task with competence and dedication, the activity has sometimes been inefficient and has detracted from some of their core investigative work. Using borrowed staff, safety studies have often required more than two years to complete. In addition, the agency now recognizes that the skills required of an investigator – such as witness interview and evidence collection skills – can be quite different from those of a safety researcher.

Conducting an effective safety study requires research skills in fields such as public policy, law, statistics, and accident epidemiology – skills that are represented only sparingly among current staff. The current strategic plan therefore includes a new goal to develop, over the next six years, a dedicated capacity for conducting safety studies. Essential elements of the goal including recruiting or developing new skills, establishing a written protocol for conducting safety studies, and creating a more formal process for selecting what safety issues to study. Creating methods for conducting effective national surveys of safety practices is an essential component.

Baseline Statistics

The agency's most recent safety study, on combustible dust hazards, will require a total of about 25 months to complete, at a total cost of \$300,000.⁴ Of four completed studies, only the study of reactive hazards included formal safety recommendations. That study contained 24 recommendations, of which approximately seven were major recommendations directed to federal agencies or national trade organizations.

⁴ Includes staff compensation allocated to the study.

Goal 3

Broadly disseminate the findings, lessons, and recommendations from CSB investigations and studies.

Key Results

- Investigations are publicized through community hearings, public meetings, news conferences, and website dissemination
- At least one public hearing or meeting for most major investigations
- Each investigation leads to appropriate outreach products that are distributed pursuant to an outreach plan
- Relevant stakeholder groups promptly receive and widely disseminate CSB information

Key Strategies (Resources, Skills, and Technology Needed)

- Conduct public events (e.g. press conferences or public meetings) for all ongoing investigations
- Identify industries and sectors that have similar risks to those investigated and target them for outreach efforts
- Develop outreach plans and products such as videos and digests based on CSB investigations and studies
- Coordinate with stakeholder organizations to disseminate CSB information to their members
- Provide Board members to deployments, key conferences, and symposia
- CSB website uses state-of-the-art technologies to provide access to essential investigative information
- Regularly brief Congressional committees and offices on the status of ongoing CSB investigations and open safety recommendations

Metrics

- Surveys of web visitors, conference and meeting attendees, and recipients of outreach materials to measure effectiveness of communication and usefulness of information for activities such as training, hazard analysis, safe facility design, and improved safety practices
- Number of outreach products developed and distributed
- Number of public meetings, events, and hearings, and speeches to strategic audiences
- Number of visits to CSB web pages, reports, and videos and aggregate distribution of news stories describing CSB findings

Discussion

The Board recognizes that a potent tool for achieving its mission is more widespread awareness of the causes of chemical accidents and the measures that can prevent them. Companies and their employees share a strong interest in avoiding major chemical accidents that cost lives, damage reputations, destroy productive capacity, and often result in expensive litigation. But many companies, particularly smaller businesses, are not aware of all the high-consequence, low-probability risks they face in operating their facilities.

For example, major industrial dust explosions are rare events but when they occur they can cause multiple fatalities and destroy or incapacitate large facilities. The culprit is often a thin layer of combustible powder – such as a fine resin dust – that has accumulated in concealed or hard-to-reach places. This hazard was responsible for devastating explosions in North Carolina and Kentucky in 2003 that cost 13 lives and caused tens of millions in property damage. In both cases, the companies were not fully aware of the catastrophic nature of the combustible dust hazard. If they had been, they would likely have taken relatively inexpensive control and housekeeping measures before the tragedies occurred.

While outreach is shared responsibility among many federal agencies involved in chemical safety, the CSB has a unique body of knowledge and insight gained from its more than 40 detailed accident investigations and safety studies. The agency's experience over the past several years is that relatively inexpensive and achievable outreach campaigns can greatly increase the dissemination of its reports, findings, and recommended safety practices. Activities have included public meetings, news conferences, speeches, and the development of focused outreach materials such as short safety videos, computer re-creations of accidents, and plain-language investigation summaries, known as digests.

At costs that are a fraction of those expended on the investigations themselves, the agency can effectively disseminate its safety information to thousand of facilities and millions of individuals in locations all over the world. The CSB's outreach programs have reached not only the traditional audiences in the oil and chemical industries but also hospitals, national parks, nuclear power plants, schools and universities, fire departments, and many other organizations. Perhaps most importantly, outreach efforts provide communities around the country with essential information they need to promote improved safety at chemical facilities in their midst.

In the past several years, the CSB has moved toward virtually 100% electronic dissemination of all its information. The CSB's website, CSB.gov, is an internationally recognized resource for accident prevention that receives more than one million hits annually. The site, which was completely redesigned in 2003, is the agency's principal interface with the public. The Strategic Plan envisions continued investment in the website to maintain its currency, including state-of-the-art technologies such as imbedded streaming video. As technologies evolve we will utilize those new technologies to extend the dissemination of CSB safety findings.

The agency's vision for outreach is that one day, the CSB's findings and recommendations will be able to reach the majority of all the companies, agencies, and other organizations that can benefit.

Baseline Statistics

In fiscal year 2006, the CSB issued reports on eight investigations. Five of these were accompanied by short safety videos highlighting the causes of the accidents and key findings, recommendations, and good prevention practices. In seven of eight cases, a news conference was held in the community near the accident site to release the final reports and/or videos. In addition, videos were issued related to two ongoing cases, and a large public meeting was held in Texas City, Texas, related to the BP refinery disaster.

During the most recent 12-month period ending in July 2006, more than 1.3 million hits were recorded on the CSB's public web site, including more than 440,000 viewings of CSB's safety videos.⁵ Over a seven-month period, more than 10,700 video DVDs were produced and distributed to individuals and members of important stakeholder groups, such as the American Institute of Chemical Engineers, the American Chemistry Council, the Synthetic Organic Chemical Manufacturers Association, and the United Steelworkers of America. More than 2,200 DVD requests and comments were received over the CSB web site during seven months; many attested to the usefulness of CSB safety videos in worker training, hazard analysis, and facility design. Approximately 7,000 people from around the world have registered to receive regular CSB news by email. Printed news stories describing CSB investigations and findings were distributed to a total of 233 million people⁶ during the most recent twelve-month period.

⁵ CSB safety videos were first provided as streaming content over the Internet on December 22, 2005, three months into the fiscal year.

⁶ Not excluding duplicate readers.

Goal 4

Achieve implementation of CSB safety recommendations.

Key Results

- CSB safety recommendations are closed based upon acceptable actions by recipients

Key Strategies (Resources, Skills, and Technology Needed)

- Maintain an efficient system for rapidly communicating with recommendations recipients, tracking the status of all open safety recommendations, and evaluating the adequacy of recipient actions
- Publicize up-to-date status information on all safety recommendations through the CSB website and other public communication channels, with an emphasis on most-wanted safety actions
- Conduct focused advocacy programs for significant, challenging safety recommendations through ongoing dialogue with relevant government and other stakeholders, testimony, and other public communications
- Publicly recognize recommendations recipients that implement significant safety actions based on CSB safety recommendations

Metrics

- Number and percentage of safety recommendations closed successfully

Discussion

Specific, measurable recommendations are a primary tool of the Board for encouraging safety improvements that help protect workers, the public, and the environment. Most CSB reports, bulletins, case studies, and hazard investigations include a number of safety recommendations directed to specific named organizations.

Recommendations recipients include government agencies at all levels, standard-setting organizations, trade associations, labor unions, and private corporations such as oil and chemical firms, engineering companies, and insurers. By statute, the EPA and OSHA must respond to any CSB safety recommendation within 180 days.

The CSB's recommendations staff works with recipients and other interested parties to help ensure the successful acceptance of recommendations. As soon as a recommendation is issued, the Board communicates with the recipient in writing, providing the text of the recommendation and citing its rationale in a specific CSB investigation. Recipients are requested to provide extensive

documentation of the actions they take in response to the CSB's recommendations. In some cases, CSB staff and board members may visit sites to assess the safety changes made in response to a recommendation.

If a recipient's actions meet or exceed the intent of the CSB's recommendation, the staff develops a formal, written evaluation urging closure of the recommendation by a vote of the full board.

Significant recommendations may require extensive, time-consuming advocacy efforts to achieve successful closure. For example, in 2003 the Board determined that improvements in New York City's 85-year-old fire code were required to help prevent future accidents similar to a 2002 building explosion in downtown Manhattan that injured 36 people.

The recommendation to modernize the fire code at first encountered skepticism and resistance. Board members conducted two public meetings in New York City, testified twice before the New York City Council, met with key stakeholders, and made a number of media appearances to discuss the importance of the requested safety changes. Within one year, the New York City government changed course and began working on a complete overhaul of the code.

In 2005, the Board developed a real-time tracking system for the status of all of its issued recommendations; up-to-date status information on hundreds of recommendations appears on the agency's popular website, CSB.gov. The Board recognizes that public, stakeholder, and media interest in the responses of recipients to CSB recommendations is a key ingredient in gaining acceptance.

Some recipients opt to go above and beyond the actions contemplated in CSB recommendations. For example, the American Institute of Chemical Engineers' Center for Chemical Process Safety – responding to a CSB recommendation for better guidance on preventing accidents involving reactive chemicals – developed and issued an entire book on the subject and through the funding of government agencies made it freely available to the entire industry. The state of Kentucky exceeded the Board's safety recommendation for controlling industrial dust explosions by establishing a comprehensive identification, inspection, and outreach program for facilities statewide that handle combustible powders.

In such instances, the Board provides special recognition to recipients through public announcements, speeches, or certificates.

Baseline Statistics

As of July 2006, the CSB had issued 383 safety recommendations, including more than 200 in the past three years. To date, 145 safety recommendations have been successfully closed based on actions that meet or exceed the Board's intentions. Many of the remainder are in varying stages of implementation, and fewer than 20 recommendations have been designated as "unacceptable" or "no longer applicable." From a low of 10 recommendations closed per year in 2003 and 2004, the CSB successfully closed 54 recommendations in 2005 and has closed 66 more as of July 2006.

Goal 5

Maximize CSB's effectiveness by strengthening human capital and infrastructure.

Key Results

- The CSB staff has the necessary knowledge, skills, abilities, motivation, and diversity to accomplish the agency's goals
- CSB has the critical infrastructure to conduct its mission effectively, such as adequate space, IT systems, succession plans, training programs, human capital plans, and performance management
- Agency has attracted and retained high-performing career employees
- In surveys, most employees report high overall satisfaction with the CSB as a workplace

Key Strategies (Resources, Skills, and Technology Needed)

- Develop and implement the human capital plan, the IT capital plan, succession plans, space plans, and continuity of operations plan
- Develop employee development tracks to better communicate career path
- Ensure teamwork, communication and cooperation among departments
- Develop metrics for the effectiveness of the agency infrastructure and adequacy of knowledge, skills, abilities
- Develop a learning culture throughout the agency through seminars and professional exchanges
- Develop and implement core competency training programs for CSB employees
- Emphasize accomplishment of action plan goals in individual performance plans and awards

Metrics

- Staff retention rate for high-performing career employees
- Employee satisfaction surveys
- Percentage of key positions covered by succession plans

Discussion

The CSB recognizes that high-performing employees are essential to accomplishing its mission. Conducting high-quality accident investigations and studies and developing effective

recommendations and outreach activities requires an exceptional level of technical skill, motivation, and diligence.

The CSB began operation in 1998 as a new federal agency without any transfer of staff or infrastructure. Since that time, however, CSB has devoted considerable resources to hiring highly qualified personnel and developing its organizational structure and procedures. From fiscal year 2007 to 2012, the CSB will continue working to improve the performance, training, productivity, and satisfaction of its workforce.

In fiscal year 2005, the CSB developed its first comprehensive human capital plan, which called for the establishment of multiple investigative teams, each with a diverse array of skills. For example, team members should have specialized expertise in evidence collection, chemical engineering, mechanical engineering, metallurgy, and human and organizational factors. Establishment of the teams, each with its own supervisory lead investigator, will be a key to further reducing the cost and duration of investigations. In addition, the plan envisioned forming a dedicated unit for conducting safety studies. As the plan recognized, conducting effective studies requires distinct skills in research, statistics, and public policy.

During the period of the current Strategic Plan, a major challenge is to recruit and develop the skills necessary to implement the human capital vision. In fiscal year 2006, the agency reassigned one of its senior investigators to begin the task of developing a comprehensive training program for its investigative staff. Virtually all career employees participated in a variety of training programs, including specialized investigative courses, safety training, and leadership programs. Aggressive use of the federal career intern program has greatly facilitated hiring at the entry-level. By 2006, nine highly talented and motivated college graduates had been recruited through this program for initial two-year appointments.

In 2006 the CSB completed a full overhaul of its information technology (IT) infrastructure, with the installation of modern servers, workstations, and other equipment throughout the agency. The CSB also completed plans for the outsourcing of its public web site to reduce costs and improve service and technological currency.

The CSB has benefited from excellent retention of key employees. As of 2006, members of the CSB's staff leadership team have an average tenure at the agency of more than six years, in an agency that was just over eight years old. However, with a large fraction of key employees now approaching eligibility for retirement, succession planning takes on heightened importance. Developing plans for replacing key investigative and administrative functions will be an important exercise during the current period.

Baseline Statistics

The CSB's second biennial survey of employee satisfaction was conducted in 2006, with results expected to be published in December. Although, no formalized succession plans have yet been

developed, the new structure being established in the Office of Investigations provides a succession mechanism for the agency's largest office.

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III. APPENDIX

Key Factors Affecting the Achievement of Strategic Goals

The following factors may affect achievement of the CSB goals for fiscal years 2007 to 2012, either positively or negatively:

- Fluctuations in agency appropriations due to constraints on the federal budget
- Difficulty in retaining or recruiting staff with appropriate technical skills and industrial experience
- Retirement or attrition of key personnel
- The occurrence of one or more catastrophic chemical accidents that may overtax agency resources or personnel
- Challenges in achieving cooperation from companies under investigation due to criminal prosecutions, regulatory actions, civil litigation, or security-related concerns
- Challenges in achieving closure of an increasing number of significant or controversial recommendations
- Development of new web or communications technologies affecting the agency's outreach programs

Relationships With Other Bureaus and Agencies

The CSB has memoranda of understanding (MOUs) with the EPA, OSHA, ATF, NTSB, and the Department of Defense Explosives Safety Board (DDESB) for coordination of investigation activities. The CSB also has an MOU with the Agency for Toxic Substances and Disease Registry (ATSDR) to provide consultation on the human health impacts of chemical exposures.

The CSB regularly coordinates with federal, state, and local authorities during accident investigations – particularly during the initial field phase – to minimize duplication of activities, share forensic test results, arrange access to accident sites, and assure preservation of critical evidence for the use of all parties. Periodically, the agency coordinates with the EPA, OSHA, NIOSH, and other agencies in the dissemination of safety information and alerts. The CSB also developed relationships and agreements with investigative counterparts from the United Kingdom, France, South Korea, and other nations.

The CSB has agreements with the NTSB and the National Response Center (NRC) to provide accident notification services, and it has agreements with other agencies to provide a variety of procurement, personnel, and travel-related support.

Program Evaluations

During its first few years of operation, the CSB received several program evaluations conducted by the Government Accountability Office (GAO) and other audit authorities. No external program evaluations have been conducted since FY 2003. The CSB anticipates that evaluations will be conducted periodically in the future by the GAO upon the request of Congress.

In addition, the Board will develop annual action plans, monitor progress in implementing those plans, and where shortfalls are identified will implement appropriate solutions. As noted above, the CSB will conduct surveys of stakeholders to determine the usefulness of CSB reports, recommendations, and outreach products.

Consultations

In developing this plan, CSB staff and board members have devoted significant time to coordination and consultation with stakeholders, including Congress, the Office of Management and Budget, trade associations, and labor unions. The CSB also gathered input in several stages from all its employees. A draft version of the Strategic Plan was published on the agency website for comment in August 2006. In addition, written comments were solicited on the draft from more than 50 individual stakeholder organizations throughout the country.

U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD



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