

**The Evolution of an EHS Culture**

**at**

**CF Industries'**

**Manufacturing Plants and Distribution Facilities**

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**Prepared for Presentation at**

**The 2001 Conference of the Central Florida Section of AIChE**

**Clearwater, Florida**

**June 15-16, 2001**

## INTRODUCTION

Over the past two decades, industry has been addressing compliance with an increasing number of environmental, health and safety (EHS) laws. To meet the compliance criteria, a company had to exert considerable effort and incur considerable expense to develop the necessary EHS policies and programs and to exercise a strong resolve to implement those programs into daily operations. Moreover, some companies elected to further enhance their EHS programs by taking a much bolder step of establishing an "EHS culture". An EHS culture is one where employee work behavior patterns routinely apply EHS principles in their day-to-day work activities. An EHS culture is a goal to be achieved but not necessarily an end. It is something a company would want to achieve and continue to develop in order to realize the numerous benefits in employee safety and reducing risk to the company.

This paper describes the evolution of an EHS culture at CF Industries' manufacturing plants and distribution facilities and the commitments and resources that were necessary to make it become a reality. It is not intended, however, to portray CF's approach as being the only, or best way, to achieve this level of EHS performance. The program described in the paper is one that has worked for the company and by sharing how it evolved, including some of the successes and setbacks, others may find the CF experience useful in advancing their EHS program into an EHS culture.

## **CF Industries**

CF Industries is one of North America's largest interregional cooperatives, owned by and serving nine regional cooperatives. Through its Member-Owners, the Company's nitrogen and phosphate fertilizer products serve to meet the needs of farmers and ranchers in 48 states and two Canadian provinces.

Nitrogen fertilizer products are manufactured at CF plants in Donaldsonville, Louisiana and Medicine Hat, Alberta, Canada. Donaldsonville is the largest nitrogen production facility in the United States and the Medicine Hat facility is a world-scale complex located in Canada's agricultural region.

Additionally, CF owns and operates facilities in central Florida where phosphate rock is mined and converted into phosphate fertilizer products. The dry fertilizer products manufactured in Florida along with anhydrous ammonia received via ocean going vessels are stored for distribution at CF facilities in Tampa, Florida.

Nitrogen and phosphate fertilizer products are transported by truck, rail, ship or barge to CF Distribution Facilities terminals and warehouses located throughout the midwest. The CF Distribution Facilities system makes fertilizer products available to its Member Owners.

## **THE EHS ORGANIZATION**

### **Background**

During the 1970's and 1980's, growing public concern over major environmental and safety incidents such as the Love Canal, Bhopal, Exxon Valdez, and several other high profile industry-related incidents ultimately resulted in the U.S. Congress passing some of the most far reaching and significant EHS legislation ever made into law. It was during those times that CF senior management determined good business practice required the company to review and enhance its safety programs and procedures. The primary objective was to ensure that all CF manufacturing plants and distribution facilities had adequate programs and procedures in-place to protect employees, nearby communities and the environment.

### **Objectives and Essential Elements**

The first task in developing a corporate EHS program was to identify exactly what objectives the company wanted to achieve. This was accomplished by researching what other similar chemical companies were doing to address their rapidly expanding EHS issues and by setting company-specific goals to be achieved through the program. To accomplish this, CF management adopted an organizational structure in the late 1980's which best suited the company's plan to implement the following objectives:

- To strengthen the coordination of the EHS program throughout the company
- To provide senior management with EHS risk assurances
- To better discover and measure EHS risks to the corporation

As the formal organizational structure was being developed and implemented, the overall effectiveness and eventual success of the corporate EHS program would not have happened without these essential elements:

- The EHS program received the endorsement and full support of the company President and Chief Executive Officer and other senior management
- The EHS organizational structure and activities were decentralized and kept separate from the influence of day to day operations

### **Positions and Roles**

With the full support of senior management, the company positioned itself to meet the stated EHS objectives by managing its program through an effective organizational structure that was formed in 1989. The major components of that organization are described below:

- Corporate Director, EHS reported directly to the CEO. This position had the overall responsibility to provide assurances that proper EHS activities were being followed at all CF locations. The Corporate Director, EHS also served as Chairman of the Corporate EHS Risk Management Committee. This position was later elevated to Vice President level in 1998.
- Corporate EHS Risk Management Committee reported directly to the CEO. This committee consisted of corporate officers with overall policy making authority to administer all CF EHS activities. The first committee members included the Corporate Director, EHS, Vice President of Human Resources, Vice President of Manufacturing and Distribution Facilities, Senior Vice

President and Chief Financial Officer, and the General Counsel and Assistant Secretary.

- *EHS Action Committee* reported to the *EHS Risk Management Committee*. This committee had responsibility for all areas of EHS. Under the guidance of the *EHS Action Committee*, several councils were formed to function within the major environmental, health, and safety areas. Those sub-committees included an *Environmental Council*, *Health and Medical Council*, and a *Safety Council*. By 1993 the EHS Action Committee evolved into the *EHS Steering Committee* that exists today to provide ongoing direction for the overall Corporate EHS process and to promote EHS awareness at all CF locations.
- The *Safety Council* provided an active forum for company safety personnel to meet to review/discuss training activities, address special problems or assignments, and to discuss safety related issues.
- Also reporting to the EHS Action Committee was an *EHS Hazard Audit Group* responsible for performing EHS audits at all CF manufacturing and distribution facilities.

Some modifications to the original EHS organizational structure have occurred since 1989 but the original framework has served to meet the company's EHS objectives in much the same way as its original structure. One of the changes included the formation of an EHS Audit Group in place of an EHS Hazard Audit Group that functioned within the EHS and Engineering Department. Other modifications included elevating the position of Director, EHS to Vice President, EHS and Engineering and the addition of more corporate officers to the EHS Risk Management Committee.

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### **Policy and Objectives**

In the year following the formation of the EHS organization, the company issued an "Environmental, Health and Safety Policy" statement to all employees. The policy statement addressed five distinct principles considered essential for implementation of the EHS objectives:

**Environmental Protection**

**Employee Health and Medical Programs**

**Safety Awareness and Training**

**Facility Design and Operation**

**Contractor Compliance**

Direct responsibility for the development and implementation of all EHS programs and procedures remained with the management at each CF manufacturing and distribution facility.

With an EHS organizational structure now in-place and a formal commitment to EHS principles as outlined in the EHS Policy, CF entered a period devoted to shifting the existing safety practices toward an EHS culture.

## **EHS AWARENESS and IMPLEMENTATION**

Success did not come easily or without growing pains in the early 1990's as the task of actively developing the enhanced EHS program began throughout the company. The EHS concept was new to most employees and some viewed it as being too radical. Some employees were skeptical and preferred to leave "well enough alone", especially since CF already had a good safety program. And, not all employees wholeheartedly embraced the new EHS philosophy. That resistance to change had to be overcome before the EHS program could develop and it took a concerted effort by many people to get the message across that the corporate EHS program was here to stay. That message was supported through several important initiatives introduced to reinforce the EHS effort and the company's commitment to the program.

### ***Annual Assurance Letters***

In 1990, annual EHS Assurance Letters were initiated as a "bottom-up" approach to solicit ideas and initiate communication about EHS-related issues. All CF employees were required to comment on the EHS program and to communicate any possible deficiencies. The Assurance Letters began with non-exempt (hourly) employees and proceeded up the organizational ladder, ultimately resulting in each company officer communicating EHS assurances. Several EHS-related items were identified within the body of the letters to aid the employee, space was provided for the person signing the letter to comment on any EHS item needing attention. Employees were encouraged to report any shortcomings or near misses observed in the work area that were not reported to appropriate supervision or to any level of management via an "open door" policy.



Following facility management review of the letters, those that contained comments were forwarded to the Corporate Director, EHS for further action.

### ***Performance Appraisals***

An indication of the extent to which an employee actually supported the corporate EHS policy and its programs was incorporated into the annual performance appraisal process. In preparing every employee's annual performance appraisal, the person completing the evaluation commented on the extent to which the employee supported key EHS measures by applying the following principles:

- Demonstrated concern for EHS in the workplace
- Acted to protect fellow workers and contractors on the job
- Exhibited a sensitivity for and drew attention to EHS problems
- Sought to achieve a resolution to identified EHS problems
- Complied with existing EHS procedures and provided straightforward and factual information if an incident or violation occurred

### ***Code of Conduct***

The Corporate Code of Conduct was also modified to include a statement regarding the company's position on EHS issues. It covered several basic policy areas, each ensuring a positive effect toward achieving the Corporation's goals of EHS assurance and conducting business at the highest level of ethical conduct.

### ***Authorization for Expenditures (AFE)***

EHS awareness also extended to the project level. A procedure was implemented to provide assurances that, when requesting funding for expenditures, all capital projects had been properly reviewed for EHS considerations. Each AFE submitted for a capital project had to be reviewed and evaluated for EHS impact. Facility management was directed to conduct a review of the EHS impacts resulting from the project and to include a standard EHS review document with the AFE.

### ***Leased Facilities***

The CF EHS policy was also applied to facilities leased by CF to store fertilizer products. Typically, 25 to 30 leased facilities are subjected to annual reviews as part of a comprehensive EHS inspection protocol to assure compliance with the applicable laws, rules, and regulations.

### ***Corporate Crisis Management Plan***

A Corporate Crisis Management Plan was created to supplement facility-based emergency response plans. The plan ensured that in the event of a large-scale EHS incident, the full resources of CF Industries would be effectively deployed to respond to the incident and to mitigate its impact. Local management maintained control and responsibility for emergency response operations and the CF Crisis Management Team composed of senior management would be available when a situation had a significant impact on the company.

Each year certain CF facilities are selected to undergo Crisis Communications training through drills specifically designed to test their crisis communications proficiency. The Crisis Management Team also participates in drills that tests crisis communications from the facility to the Corporate level. In lieu of those full-scale crisis communications drills, unannounced notification drills are also conducted to test a facility's ability to notify employees with crisis communications responsibilities in a timely manner. It is not uncommon for the company to initiate 20 to 30 crisis communications or notification drills a year to ensure crisis communications management proficiency throughout the corporation.

### **Reference Materials**

The EHS program required that the corporation provide adequate resources to ensure that the overall EHS objectives could be met. In addition to a formal EHS organization endorsed by senior management and several initiatives to support EHS awareness, the company also developed two important reference sources in the early 1990's that included an "EHS Management Manual" and the "Standard for the Storage, Loading and Unloading of Anhydrous Ammonia." Each document provided corporate guidelines to facility personnel for specific areas of the company's EHS policy and ammonia safety.

#### **EHS Management Manual**

The EHS Management Manual was published and distributed throughout the company in 1990 as the primary reference for implementing EHS policy. That manual was an invaluable reference tool for line supervision to assist them in understanding the corporate EHS objectives as well as providing guidelines for implementation of the

corporate EHS Policy. Some of the major topics in the first edition of the manual included the EHS Policy Statement, guidelines for Operations Management, Training, and Auditing. It also presented the requirement for written procedures for Personal Protective Equipment, Lockout/Tagout, Confined Space Entry, Industrial Hygiene, Hazard Communications, Excavation, and other important health and safety programs. Perhaps the most innovative topics were related to process safety and included Process Safety Information, Management of Change and Process Hazard Analysis. Two years later, those items along with others became law under the OSHA Process Safety Management standard. Because of the rapidly growing list of EHS items, the EHS Management Manual had to be revised and updated and was re-issued in 1996. It remains in use today as the primary reference for the company's EHS policy and is again being revised and updated.

#### *Ammonia Standard*

Known as the "Ammonia Standard," the CF "Standard for Storage, Loading and Unloading of Anhydrous Ammonia" was distributed throughout the company in 1991. That document represented a milestone in ammonia safety by specifying minimum acceptable design and operating practices for ammonia processes at all CF manufacturing plants and ammonia terminals. Moreover, it introduced consistency throughout the company in ammonia safety practices. The manual resulted from the efforts of a sub-committee of the EHS Action Committee. That sub-committee eventually evolved into the CF Ammonia Committee that reviews ammonia related issues and makes recommendations to the EHS Steering Committee for company policy in ammonia safety.

The significance of the Ammonia Standard was underscored by the company President and Chief Executive Officer in a letter to all CF facilities. That letter affirmed that the Ammonia Standard was another step in the company's continuing commitment to operating integrity, environmental security and human safety.

## **ENSURING SUCCESS**

### **Key Elements for Success**

Certain key elements were essential for the EHS Policy to be successfully implemented throughout the company. Without them, the EHS initiative would have failed. Those important key elements were as follows:

- Senior management's endorsement of the EHS program
- A written EHS Policy Statement
- Clearly defined objectives to be achieved through the EHS Policy
- Adequate resources to support the objectives of the EHS Program
- An EHS organizational structure with policy-making authority and functioning independent of day-to-day operations

### **EHS Hazard Audit Group**

An early initiative to spread the corporate EHS policy throughout the company was the "Plant and Distribution Facility Hazard Audit Group." This group of CF employees was given the mission to visit and audit the compliance status of all CF manufacturing plants and Distribution Facilities. The group's primary focus was placed on mechanical and safety issues that were associated with "hazardous materials handling." Although the audit group's mission was to ensure EHS compliance throughout the company, it was clearly not the audit group's purpose to relieve facility management of their responsibility for implementing the Corporate EHS program.

## **Signs of Progress**

The years 1994 through 1999 represented a period of continuing EHS program refinement, improvement and implementation of EHS practices. Those years were also times of lessening resistance to the EHS initiative and increasing employee awareness of EHS. One important indication was development of the EHS programs. In the early 1990's, much effort was directed toward writing EHS programs and establishing training for the employees. However, at times the effort seemed not to be working when some facility EHS programs were found to be incomplete or omitted. With continuing effort by a lot of people, most EHS programs were in place by the late 1990's. This milestone and the corresponding increase in employee awareness of EHS were positive signs that an EHS culture was developing within the company.

Another indication of the maturing EHS culture was an increasing number of EHS-related activities developing beyond the company "fenceline" as indicated by the following examples:

- CF employees trained with firefighters at Purdue University to learn how to safely implement ammonia suppression procedures. This same type of training continues today at annual sessions held in Holden, Louisiana.
- Community outreach was growing as more and more CF employees actively participated in State and Local Emergency Planning Councils and company sponsored activities, such as the Community Awareness & Emergency Response (CAER) program.

- **CF sponsored the National Watershed Award presented annually to three communities and one corporation to honor their water conservation efforts.**
- **CF's "Classroom Minigrant Program" began in the 1998-99 school year to support and improve agricultural and environmental literacy in communities where the company operated fertilizer distribution warehouses and terminals.**



## **ACCOUNTABILITY and PERFORMANCE**

From the very outset of the company's EHS program, accountability was essential if the company's program was to evolve and succeed. Facility management had to be accountable for the implementation of the EHS corporate policy, programs and practices applicable to their facility. To gauge how well or how poorly the EHS programs were actually working required an objective way to measure EHS performance.

### **EHS Audits to Measure Performance**

One method to evaluate progress was through the EHS audit process that was designed to provide an objective opinion of the corporation's EHS compliance, facility by facility, and the corporation as a whole. Collectively, information obtained from EHS audits provided senior management and the Board of Directors with an indication of the company's EHS performance. At the facility level, EHS audits documented non-compliance items that required the prompt attention of facility management.

Although EHS audits proved to be an effective way to collect and convey information about EHS compliance and performance, the audit process was not without its limitations. The identification of non-compliance items documented in the audit reports proved useful in evaluating EHS performance and applying consistency for compliance throughout the company. However, because of certain limitations inherent in the audit process, EHS audits could not be relied upon to provide absolute assurances of total EHS compliance or that a serious EHS incident would not occur.

Throughout the 1990's, the continuous process of addressing EHS non-compliance issues and the increasing employee awareness of EHS policy, programs and practices were contributing toward making the CF-EHS culture more of a reality.

### **Safe Work Hours**

Another measure of EHS performance was the number of safe work hours, or days, a facility accumulated without a lost time accident. Several CF Distribution Facilities' had exceeded 30-years without a lost time accident and some manufacturing plants had recorded over one million to five million safe work hours. A recent CF construction project had over three million safe work hours without a lost time accident at the conclusion of the project.

### **Voluntary Protection Program**

CF facilities in six states became recipients of the OSHA Voluntary Protection Program (VPP) STAR award. VPP-STAR recognizes sites whose safety management programs and practices go beyond OSHA standards to protect workers. STAR is awarded in recognition of being in the forefront of employee protection. Today, there are approximately 600 STAR facilities in the United States out of more than 6 million industrial sites.

## **Alberta Partnership in Health and Safety**

The Medicine Hat Nitrogen Complex in Alberta, Canada received the "Alberta Partner in Health and Safety Award". This distinction was based on the facility successfully fulfilling the requirements of health and safety systems in use at the plant.

## **More Indications of an EHS Culture**

By the end of the 1990's, information provided by the EHS audits and facility safe work records were positive indications that the corporate EHS program, and culture, was evolving throughout the company. By then, EHS programs had been written and implemented, manufacturing plants and distribution facilities had actively incorporated the EHS policy into their work practices. The manufacturing plants and Distribution Facilities had facility-based EHS staff members to oversee practices and to train employees. Collectively, all these assurances served to reinforce the fact that an EHS culture was developing throughout the company. But, on May 24, 2000, a serious EHS incident at the Donaldsonville Nitrogen Complex underscored the fact that despite the level of performance and amount of effort committed to the company's EHS program, there were no absolute assurances that a serious EHS incident would not occur.

## **Lessons Learned**

The Donaldsonville incident raised the obvious question of how such an accident could happen, especially with the caliber of the company's enhanced EHS programs and practices? The effects of that incident impacted everyone throughout the company and the lessons learned will not be wasted. The lessons learned will serve to further enhance

**the company's EHS program and to elevate safe work practices in CF facilities to a higher level than before. Those lessons have been translated into new initiatives and objectives for the company's ongoing EHS program.**

## **NEW INITIATIVES and OBJECTIVES**

### **Changes to EHS Audits**

A thorough investigation of the Donaldsonville incident resulted in immediate and long-term changes at that facility and in modifications to the EHS audit process. EHS compliance auditing will continue as in the past but more audit resources will be applied to in-depth reviews of repair and maintenance procedures in areas of high risk. All CF facilities will benefit from the added value of the audits by not only receiving relevant compliance information but also gaining more insight into procedures associated with maintenance and engineering practices, particularly in areas where the consequences of a serious EHS incident are considerable.

### **Increased Emphasis on Contractor Safety**

In the future, unannounced safety inspections will be scheduled more frequently during tank outages, major construction projects and turnarounds to increase safety awareness and to place more emphasis on observing contractor safety practices. Non-compliance issues documented from the unannounced safety inspections will be corrected and the information will be used to evaluate contractor safety performance.

### **Proactively managing risk**

Increased emphasis will be placed on managing risk by going "beyond" normal practices. An example would be where facility management voluntarily elects to manage risk by applying Process Safety Management practices to processes not covered by the OSHA standard.

### **Identifying Cause**

Increased effort will be placed on identifying "root causes" that led to a near miss, accident or a serious EHS incident. Root cause information will be used to prepare recommendations to eliminate a recurrence of the same type of incident. This information will be made available to facilities throughout the company.

## CONCLUSION

Establishing an EHS program is not easy; developing an EHS culture is even harder!

This paper has attempted to present an outline of an EHS program that has worked for CF and, hopefully, some of the experiences will be useful to others who may be in the process of developing their own EHS cultures.

Although the process has not been perfect, or ever will be, the EHS experience is a continuing evolution of changing policy and practices. As the EHS process develops toward an EHS culture, the rewards are many. An effective EHS culture not only provides employees with a safe workplace and the surrounding communities with a sense of well-being, it also provides important economic incentives that can help reduce the cost of doing business in areas such as insurance coverage and the cost of borrowing money.

Based on the CF experience, the following elements have proven to be essential for the evolution of an EHS culture and management of EHS issues. The information presented below is a summary of what CF experienced in its EHS program development and may be useful to others who may be working toward the same goal:

- ***An EHS program must have the full support of senior management***

Attempting to implement a successful EHS program without the full endorsement and support of senior management will not work. Senior management support is essential and that support must be made known throughout the corporation such as

communicating this support in the form of a corporate EHS policy statement. Other incentives, such as employee annual EHS assurance letters, EHS considerations as part of the employee performance evaluation and EHS considerations in capital projects are a few things that can be done to increase EHS awareness in support of the company policy.

- ***Establish a Corporate EHS organization with policy making authority that functions independently of day-to-day operations***

Many important decision making events will occur as an EHS program develops. To effectively react to those changes the EHS organizational structure must function autonomously and be designed to implement the program with policy making authority. Moreover, a mechanism for resolving EHS-related conflicts is necessary when disagreements inevitably occur. CF empowered the Vice President, EHS and Engineering with the ultimate authority to resolve matters of EHS conflict.

- ***Commit sufficient resources to ensure that all objectives of the EHS program can be met.***

Even with a written EHS policy and a functional organizational structure, an EHS program cannot survive without sufficient resources. Resources come in the form of a budget to fund EHS-related activities, personnel to staff EHS organizational needs, materials and equipment to educate and train, processes to measure performance, and, when needed, outside expertise for special activities.



- ***Measure the effectiveness of the EHS program and make changes when necessary to meet the evolving needs of the company***

EHS performance has to be measured to understand its effectiveness and, when necessary, the system has to be flexible enough to make adjustments. For an EHS program to evolve into an EHS culture, changes will inevitably occur. Some changes will correspond to policy while others may result from committee recommendations or be dictated by the results of an EHS incident investigation. Whatever the reason for change may be, an EHS program must be adaptable to evaluate the effectiveness of its program and to make changes for the right reasons.

- ***Implement effective procedures for follow-up and taking corrective measures***

When changes to EHS procedures occur, a mechanism must be available to effectively assess those changes and, when necessary, make corrections to keep the program moving in the right direction. Without a follow-up procedure, the effort to implement the change may become lost. An EHS organizational structure must have a mechanism to provide assurances that corrective measures are proceeding as planned.

- ***Continuous education and training of employees to instill positive EHS-related behavioral patterns***

Implementing an EHS program is an ongoing process. An important part of the program is employee acceptance. Employees must receive the right message and understand that EHS is part of their work responsibility and is not an option. CF

developed a program for EHS training for future management candidates. The program completely removes personnel from their operating responsibilities and trains them as full-time EHS auditors. The training typically occurs over a two year period. At the end of their training as EHS auditors, they return to an operating facility well versed in the corporate EHS policy, programs, and rules and regulations. Since 1990, 20 CF employees from operating facilities have been assigned to serve in the EHS Audit Group. Of those, 2 are currently facility General Managers, 5 are Area Managers, and 9 have been promoted to Superintendent level positions.

- ***Focus on an EHS culture as the ultimate objective.***

An EHS culture may be somewhat difficult to define but it can be observed. An EHS culture becomes apparent when, as a normal pattern of work behavior, employees apply EHS programs, training and practices to their day-to-day work routines. An EHS culture is the ultimate goal to be achieved because when it occurs, the company becomes a safer place to work, nearby communities are safer places to live, the environment is protected and overall risk to the company is substantially reduced. More importantly, an EHS culture is the right thing to do.

## **ACKNOWLEDGEMENTS**

**This paper is dedicated to all CF employees who have worked to make the CF-EHS program a success and to those who are working today to keep the EHS program strong. And to all who are making EHS a top priority at manufacturing plants and distribution facilities within their industry with the goal of achieving their own EHS cultures.**