A Decade of Safety Improvements Nets an “Ace Safety Year”
at the Hampton/ NASA Steam Plant

Michael E. Croft, Operations Manager
Hampton/NASA Steam Plant

ABSTRACT
During 1999, the Hampton/NASA Steam Plant achieved a distinguishing safety milestone by completing the year without a single OSHA recordable accident. At the end of the year, the plant had also worked 422 consecutive days without a lost time accident. The Steam Plant Manager, John Austin, called this significant milestone the “Ace Safety Year”. Over the decade Worker’s Compensation and medical expenditures decreased form $153,000 to just $234 by 1995. The savings in insurances premiums is now equal to the amounts spent annually on all safety equipment, employee physicals and uniforms.

The Hampton/NASA Steam Plant is a Waste-to-Energy facility located on the NASA Langley Research Center in Hampton, VA. The facility provides the Center steam energy by burning municipal waste from the City of Hampton and neighboring communities. The steam plant operates 365 days a year 24 hours a day with a staff of 34 full time employees. A Joint Board represents the owners, the Federal Government and the City of Hampton, and directs the operations and finances of the enterprise through a Steam Plant Manager. In 1990, the Joint Board decided to select a mechanical engineer with extensive power plant experience as the new plant manager.

After initial assessments of the facility and its programs, the manager’s first priority was to establish a new safety program and safety attitude. By January of 1992 the new safety program was fully implemented. This new safety success began with a top down attitude with the plant manager designating himself as having the overall responsibility of the safety program. The Operations Manager was designated the Steam Plant Safety Officer, and half of his time would be shifted to performing safety duties. An independent Safety Committee was formed to help re-engineer safety procedures and spark safety awareness.

Safety training now begins on day one with all new employees and contractors are given intensive orientation consisting of training for all steam plant safety programs and protective equipment. Safety procedures and training were emphasized for every task or event. Every training event had to include a safety related component. Team leaders were all sent to OSHA 40 Hour General Safety Training. The Safety Officer was charged with becoming our safety expert by attending specialized OSHA training and seminars. Safety success is now viewed as an issue of educating and exciting managers and workers.

Personal Protective Equipment expenditures were tripled and went beyond requirements. Procedures were developed to reduce employee exposure to below all OSHA action levels. Respiratory protection was increased by issuing each worker powered air purifying respirators. All employees are now given respirator physicals. Safety shoes and prescription safety glasses were purchased for all employees.

An extensive Safety Awards program is used as an annual re-focus to safety. As employees gained trust and confidence in the safety program, “near misses” began to be reported. Suddenly we had a facility that was full of safety enthusiasts. Worker’s Compensation costs and premiums have continued to decline. Then in our twentieth year of operation, we achieved our greatest safety milestone: ZERO accidents.

The Hampton/NASA Steam Plant

The Hampton/NASA Steam Plant is a Waste-to-Energy facility located on the NASA Langley Research Center in Hampton, VA. The facility provides the Center steam energy by burning municipal waste from the City of Hampton and neighboring communities. The steam plant operates 365 days a year 24 hours a day with a staff of 34 full time employees. The 240 ton per day plant has two units that produce a total of 66,000 pounds of steam per hour. Annually, the waste facility processes an average of 84,000 tons of refuse, disposables 27,000 tons of residue ash and exports more than 350 million pounds of steam to the Center. The annual environmental impact is a savings of 3.5 million gallons of fuel oil that would normally be consumed by the Center’s steam plant. A reduction in criteria air pollutants is achieved by reducing the volume of fuel burned and with a 10:1 reduction ratio for the volume of trash in verse the ash out, about two acres of land is saved by not burying raw garbage.

A New Safety Program

As with any accident, there is a chain of events that lead to the final event in which the accident occurs. The same goes for the prevention of an accident. A chain of events takes place and the risk of accident is diminished significantly or eliminated all together. The chain of events for the Hampton/NASA Steam Plant began in 1991 with the hiring of a new plant manager.

After an initial assessment of the facility and its programs, the new plant manager’s first priority was a new safety program. From 1980 up to this time, the steam plant was using the Center’s
The benefit was finally zero in 1999 (See Figure 1). The control room with other technical and operating manuals. This and job specific safety manual expert. Safety procedures and help promote safety awareness. Time filling safety duties. He would become the plant's safety responsibility of the safety program. Which means that close to half of the workforce that should be covered by OSHA do not have a safety and health program to protect them. We were in that 30% category; we had no company specific safety and health program.

Through his commitment to safety, a new safety program was implemented in 1992. Success begins with a top down attitude and here the plant manager designated himself as having the overall responsibility of the safety program. The Operations Manager would perform the collateral duties of Safety Officer with half of his time fulfilling safety duties. He would become the plant's safety expert. A Safety Committee was developed to assist managers with safety procedures and help promote safety awareness. A company and job specific safety manual was written and printed copies given to each manager and team leader. A shared manual was placed in the control room with other technical and operating manuals. This was the plant's foundation; it was straightforward and in existence. The benefit was immediate as the injury rate decreased from seventeen injuries in 1991 to seven in 1992, three in 1993 and finally zero in 1999 (See Figure 1).

![Figure 1 INJURIES](image)

Training

New employees were given an orientation based on the administrative needs of the City. However, this changed quickly and safety was given the priority. New employee orientation would now include safety training consisting of proper PPE use and all plant safety programs. This training and the issue of basic protective equipment had to be completed before the employee was assigned to a team. Contractors also receive the same plant specific safety training. All training, in class or written, must include a safety component. Safety awareness had to become as common place as coffee in the morning.

Team leaders began attending the OSHA 40 Hour General Safety Training becoming more knowledgeable and effective in administering safety programs. The more knowledgeable and more comfortable they became in controlling activities, the more willing they were to accept responsibility and take ownership of the safety program. This was another ingredient to our safety success. This sharing in safety responsibility increased the "safety team" from two, to a team of seven. Many employees place the burden of enforcing safety on the safety officer and feel they have no role in the pursuit of safety for coworkers or even themselves. Due to the attitudes now developing within the leaders, the safety officer had a team to support him.

Jobs were put on hold or even stopped and rescheduled due to safety concerns. There was no chastising, but a discussion of the error to ensure understanding. On occasions, the Operations Manager was forced to cut production due to his own procedures as Safety Officer. It took a team of support to ensure that even the Operations Manager/Safety Officer remained consistent. This was the teamwork that kept each other safe. Regardless of position or title, employees spoke up and alerted others of a safety issue. No malice, finger pointing or ill intent; only a genuine concern for coworkers' safety.

Safety was becoming contagious. Injury rates stayed low and lost workdays declined from 345 days in 1991 to and average of less than one a year from 1993 to 1996 as shown in Figure 2.

Personnel Protective Equipment

Personal protective gear consisted of a pair of gloves and a hard hat. In the new program, personal protective gear is issued and payed for by the steam plant. Long before the argument of who should pay for employee PPE, the steam plant was purchasing these items to gain control of the process and manage the quality of the equipment. The introduction of PPE also entailed hazard assessments which led to new engineering controls, administrative controls and the purchasing of upgraded PPE.

Industrial hygiene testing was performed in areas were dust masks were once used at the discretion of the employee assigned to the task. Test results for electrostatic precipitator cleaning was found to be above the OSHA action levels for lead and cadmium.
With this knowledge, specific procedures were written for the task, the hazard (lead and cadmium) was removed prior to beginning work and the proper respiratory program was initiated. Now the mechanics, that assisted in the re-engineering of this activity, are working in an environment below OSHA permissible limits and wear a full face PAPR.

The same procedure has been tested and developed for furnace and fireside cleaning. Beyond the proper respiratory protection, the employees have also gained the added benefit of better eye protection through the use of the full face respirator. This helped bring down injury rates by eliminating eye injuries incurred while performing these tasks. Safety expenditures had doubled, but workmans compensation and medical costs had dropped to the lowest level in the plant's 20 year history (See Figure 3).

Safety Committees

Several problems were encountered once committees were established. The first problem was the committee wanted to reinvent the safety manual. The plant manager gives direction and goals each year.

There is the employee that wants authority with the title of Safety Committee Member. Supervisory personnel remain in control and supervisory personnel are not to pass on that responsibility to a committee member. Another problem was when committee members passed information from the committee to the workforce, it became law. Our committees reported to the plant manager and topics from committee meetings were either passed on orally or a summary was posted in the facility. Once this information got out, workforce took it as law. Procedures were changed and new tools were purchased without any approval from the plant manager or safety officer. The best solution that we saw to this problem was the creation of a safety newsletter. One of the committees began writing a newsletter that clearly provided the workforce with information from the committee and other related safety topics in an informative style. The added benefit of the newsletter was that it also caught the interest of those employees that normally did not read previous safety committee notes.

Safety committees became more knowledgeable and dedicated over the decade. Employees serve a one year term with the committee. This affords everyone the opportunity to be apart of the process and begin buying into the safety program. Meetings are open, but most employees make suggestions or voice concerns through committee members. The most commendable aspect of the committees' success has been their ability to recognize "real" hazards and make reasonable recommendations. In other words, they did not spend their time chasing frivolous topics with radical and costly remedies. Trust and confidence increased and this increased the near miss reporting. Many companies that are seeing improved safety rates credit their increase in near miss reporting and the ability to investigate these near misses.

However, don't expect all safety committees to be successful. There have been years when poor leadership or poor committee support resulted in an ineffective committee. In these years, the absence of the committee keeping safety awareness throughout the plant was felt. Though injuries remained low, an employee's lack of following basic safety procedures was evidence of a less than safety conscious workforce. The momentum and awareness was lost in those years.
Incentive Programs

Incentive programs are still a great debate. But incentive programs should really be approached as a recognition or as we say “a time to re-focus on safety”. The program should not be like the proverbial carrot used to entice employees to work and behave properly. The program should be the positive reinforcement to recognize safe and quality work. To recognize the safety achievements made by those who made smart decisions, followed procedures and worked safely.

The steam plant alternates years in providing an informal safety breakfast and a formal safety dinner. At these events, all employees receive a minimal gift, noteworthy awards for 5, 10, 15 consecutive years accident free and then the main attraction which is a drawing of names for three eligible employee to receive a gift certificate worth $400 each. Eligible employees are those that have not been involved in an accident or unsafe practice over the year. The minimal gifts are items with the company logo that employees will wear or use and will keep the focus on company and safety.

The plant also has an instant recognition program using a scratch card game. This is the game where employees earn scratch off cards that give them points to purchase merchandise from the vendor. Steam plant employees earn cards for working safely, going above and beyond in their work, contributing ideas and participating in training. Basically, the intent is to give team leaders a venue to say “thank you” or “good job”.

A concern with incentive programs is that there will be under reporting. At the steam plant there are only 34 full time employees and all are at one location. It is extremely hard to hide an accident or injury. Under reporting for close calls does occur, but it is due to employees not taking the time to fill out the paper work. I call it “form phobia”; there are employees that do not like to fill out forms or they “just don’t have time”. We hope to resolve these excuses in the near future.

The Milestone

Throughout the decade employee trust and confidence flourished and new employees were provided with a safety conscience culture to work in. All employees enjoyed a workplace that put the safety statistics to their benefit.

The first non-calendar year without a lost time accident was achieved in 1993 with 399 consecutive days without a lost day. A second non-calendar year without a lost time accident was achieved in 1996 with 578 consecutive days with out a lost day and the OSHA 200 Log for 1996 recorded zero lost work days. The finale was a distinguishing safety milestone for our plant. At the end of the decade, the Hampton/NASA Steam Plant completed the year 1999 without a single OSHA recordable accident. At the end of the year, the plant had also worked 422 consecutive days without a lost time accident. The Steam Plant Manager, John Austin, called this significant milestone the “Ace Safety Year”.

It took a commitment to change attitudes and put money into the needed programs. It took time and it took a TEAM effort (safety is not a one man job - it is everyone’s job). And it began with a simple clear program and a manager willing to demand safety regardless of the production consequences. As John Austin often says, “Production, quality and safety are inseparable; you cannot excel in any one without the others”.

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