

Mining Safety Improvement at Cargill's Avery Island Salt Facility

In 1998, 100 years after the establishment of current mining operations, Cargill Deicing Technology, Avery Island, embarked on an initiative to advance the mine's safety activities by directly engaging employees. By the following year, this initiative had led the mine to adapt BST's Behavioral Accident Prevention Process® (BAPP®) technology, named SALTY for *Safety at Avery Lies in Teamwork from You*. Today, the site is enjoying a 50% reduction in injury rates, improved safety culture, and enhanced cooperation among all levels at the mine.

History of Avery Island Mine

Located in the marshlands of southern Louisiana, Avery Island is one of a chain of small mounds pushed out of the surrounding swamp by immense salt deposits left by an ancient ocean. Rising to just 200 feet above sea level and little more than two miles across, Avery Island has been used as a salt source for at least a thousand years. Early residents harvested salt from natural brine springs on the island. The island later became an important source of salt during the 1800s when various proprietors used surface and some underground mining techniques. The island's resources were even the target of hostilities during the American Civil War when Union Army Forces destroyed mining operations in 1863.

The present day mine was established in 1898 when a shaft was sunk 500 feet into the island's immense salt dome. At 1½ miles wide and 45,000 feet deep, the dome contains an estimated 150 billion tons of salt. Currently, Cargill Deicing Technology is production mining at 1,300 feet and 1,600 feet below the surface. In order to maintain its 2.5 million ton annual production, the mine uses approximately 1.5 million pounds of explosives to blast 700 new tunnels a year. Salt is crushed and screened before being loaded onto barges or trucks for delivery to a wide range of clients. The mine's salt is shipped throughout the United States for use as agricultural feed salt and as deicing salt for use on highways, streets, driveways and sidewalks. Avery Island salt is also

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used in industrial applications such as water softening and chloralkali production, and provides the salt used in the production of Tabasco® Sauce, made by McIlhenny & Company, the mine's only industrial neighbor on the island.

Acquired by Cargill Incorporated in 1997, the mine is staffed by a workforce of 136 hourly and 44 salaried employees. Hourly employees are represented by the International Chemical Workers Union Council/UFCW.

Launching the SALTY Process

In 1998 Avery Island mine began looking at behavior-based safety as an addition to existing safety activities. The mine had a good compliance record, frequent training, and an active JSA program, yet management recognized a need for greater employee involvement. Mine manager **Gil Elrod** says they liked the behavior-based approach because it was safety done by the worker instead of safety done to the worker, "Our safety had more been supervisors directing people. An hourly-driven process eliminated the perception of hidden agendas and allowed employees to be more involved in their own work processes."

Operations coordinator **Lonny Badeaux** took three hourly employees to a seminar on behavior-based safety to find out more about the people side of safety. The seminar left such a favorable impression that management shut the mine down for a day in order to present the concept to site employees. After getting buy-in from both the union and management, the site decided to go forward with an implementation of the BAPP technology. The site assembled a team of eight hourly employees: four from surface operations and four from the mine.

Working with BST consultant Jim Marcombe, the SALTY team developed a list of critical behaviors, trained observers, and learned action planning to remove barriers. Says present SALTY facilitator **Steve Seneca**, "This was the first time that employees were involved in managing their own safety." As operations coordinator, Badeaux continues to maintain his overall responsibility for safety. He notes that the SALTY team's activities did not change the need to work on other safety systems, but it did add a new dimension to the safety culture. Says Badeaux, "The process has given me the opportunity to get the safety message across to the workforce in a new fashion."

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Gil Elrod
Mine Manager
Cargill Deicing Technology

An Hourly-Run Process

One of the biggest changes in the SALTY process from past safety initiatives was that hourly employees, not supervisors, drove process activities. Hourly employees now were responsible for conducting observations, managing data, scheduling meetings, and initiating data-driven action plans targeting improvements in such things as mine equipment and systems.

While these changes certainly appeared attractive, many employees initially were hesitant. There were concerns about approaching others about safety issues and that observations would be used for discipline. In addition, **Floyd Richard**, President ICWU local 27, notes reported instances of some companies using employee-driven initiatives to disrupt union activities. Says Richard, "It all depends on what's in management's heart. I was resistant at first, but if you're a leader, you have to have a little bit of wisdom. You have to look at both sides and consider what's

good for the people you represent." After discussing the union's concerns with management and BST consultants, the union agreed to offer its support of the process and work with management to identify those employees who would be involved. Says Richard, "When we do something we do it 100%."

Observation training helped many employees overcome the fear of approaching others. Steering team members worked with new observers to show them how to use the Critical Behaviors Inventory® (CBI®) list as an objective measure to discuss safety with their coworkers. Team members also trained observers in interaction skills that allowed them to generate trust with the coworkers they were observing, and to conduct feedback in a way that allowed the observed worker to openly share concerns and ideas. As observations got underway, employees saw that observations were not used to "catch" people or discipline them.

Seneca notes that they know they have a truly hourly-driven process because of the autonomy given to the SALTY team by management, "Management helps us out but they give us free rein to design the training and to find the best way to do things." Within a few months of kick-off, the SALTY team was using the observation data to identify barriers to safe work.



The SALTY Team from left to right: **Kenneth Bashay**, co-facilitator **Phillip Barras**, **Leroy Viltz**, facilitator **Steve Seneca**, **Enol Guillot**, **Frankie Williams**, **Chad Dionne**.

Not pictured **Scott Barras**, management sponsor **Lonny Badeaux**

Building an All-Employee Process

After one year of field observations, the SALTY team faced its first significant barrier to long-term improvement: observation numbers had plateaued at a level below the team's target. One of the critical functions of a behavior-based process is to provide accurate data on the risks present at the working interface, that is, the place where employees interact with equipment and systems. When the data pool is too small or not sufficiently representative of a work group's range of activities, the process can lose critical opportunities to intervene where the risk for injury is greatest. If the observation deficit is great enough, or if it continues for a long enough period of time, the process can die out all together. Says Seneca, "Our confidence was up in the meeting room, but not out in the field."

An initial investigation of the problem showed that a significant factor was the lack of buy-in for the process among supervisors. "They weren't involved," says Seneca, "If changes were not made soon, the process might never be accepted." As part of the initial implementation effort, the SALTY team had excluded supervisor involvement because they wanted the process to be hourly-driven. As the team soon discovered, however, a lack of supervisor understanding of, and buy-in to, the process was making it difficult for SALTY team members to get time away for meetings or even to schedule observations.

Working with site managers and supervisors the SALTY team invited BST consultant Rebecca Timmins in to do targeted education and buy-in sessions with supervisors. Timmins reviewed the function and structure of the SALTY effort with the supervisors and showed them specific ways they could support SALTY activities.

Since the training, Seneca notes that supervisor involvement and cooperation is up, "It's really motivated them to schedule time for observations every day." As supervisors became more actively supportive of the SALTY process, observations steadily increased and injuries steadily decreased.

Preventing Incidents Upstream

One important goal for the Cargill Salt Avery Island mine is to achieve zero incidents. Says Elrod, "The only way to do that is to get out ahead of the ball and not just respond when an accident occurs. We want to respond before it happens. This process identifies areas where we are most likely to have incidents so we can deal with them and address them proactively. We're cutting risk out of the work process."

To date this year, the SALTY team has completed three (3) action plans on barriers identified through behavioral observations. Most of the action plans generated target barriers that make critical safe behaviors difficult (requiring extra effort) or non-enabled (outside the employee's control). While feedback through the observation is generally effective at targeting enabled barriers (within the employee's control), difficult and non-enabled behaviors usually require resolving barriers in equipment or systems. An example of this



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kind of barrier removal is the recent action plan related to use of the mine's ANFO loader equipment.

ANFO, which stands for ammonium nitrate fuel oil, is the blasting agent mine workers use to release the salt, sometimes yielding as much as 7,000 tons per blast. Workers drill holes at strategic points in the salt face, then load the holes with explosive. The charges are detonated electronically from the surface at the end of the day. Handling ANFO is one of the fundamental activities at the Avery Island mine.

At Avery Island the ANFO loader is a specially designed machine that raises a 15-foot-wide basket up to 30 feet high, allowing the workers to "load the shot". This is done by inserting a blasting cap into the end of a 2" hose, which is then pushed into a pre-drilled hole. The blasting agent, ammonium nitrate, is then pumped into the hole until it is filled.

Through the observation process, the SALTY team identified an at-risk behavior that had previously gone unnoticed. When off-loading the 50-lb bags of nitrate onto the ANFO loader, workers were standing on the handrail and overextending in order to reach the bags on the back of the pallet, essentially putting the workers at risk of back injury. SALTY observation data not only identified the risks involved, but recorded the barriers that were causing employees to perform this task at risk. Using this data, the SALTY team studied the problem and devised an action plan. By removing the top bar of the loader basket, employees would be able to reach all of the ANFO without overextension and still preserve the fall protection afforded by the basket. Notes Seneca, "The problem was always there, but the observations allowed us to do something about it before there were injuries."



Working Towards Long-Term Success

One of the hallmarks of a sustainable safety process is how well it is integrated into the fabric of every day organization activities and priorities. Elrod points to changes in employee-supervisor safety discussions as proof that the mine's work practices are changing around

safety, "Observers now are talking to supervisors about scheduling observations before a big job comes up." In addition, Seneca notes a change in how people consider work before they do it "On our CBI® checklist the category for Tools and Equipment has a section entitled "Selection and Use"—If the right tool for the job is available, take the time to go and get it. I can honestly say that I see this happening more now than before. Employees are focused on doing the job soundly."

The success of the process at improving safety and communication encouraged mine management to add process activities as a measure on its performance-focused Balanced Scorecard. Says Elrod, "The process opens communications up between coworkers, and between workers and supervisors—most of our employees feel a part of their process now as opposed to just being told. I do see people changing, being more open minded—especially among the salaried employees! If people are communicating better, they work together better and I certainly think productivity and efficiencies are a benefit."

Conclusion

As the SALTY team looks forward, it plans to train additional observers and is looking forward to advancing the techniques they use for observer training. Elrod notes that the site also plans to continue its plan for broader participation, "It takes everybody, not just one or two people. It's really been a team effort."

