2018 Safety Award Entry
for Best Safety Innovation
Landfill Gas & Biogas
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Landfill Gas & Biogas : DTE Biomass Energy

- Category: Innovation
- Technical Division: Landfill Gas and Biogas
- Entrant Organization: DTE Biomass Energy
- SWANA Member Number: 1020757
- Title of Entry: Hazard Recognition and Control
- Jurisdiction: DTE Biomass Energy operates landfill gas to electricity, direct use, and High-BTU sites across the country
- Number of affected employees: 52

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Executive Summary

DTE Biomass Energy (DTEBE) operates or owns 19 landfill gas to energy projects across the country in which we perform a wide array of tasks ranging from trenching to engine work to electrical repairs. These sites are usually staffed by one to five employees, making specialization difficult and requiring an individual employee to perform many different types of non-routine tasks. In our analysis of near misses, first aid injuries, and OSHA recordable injuries we found that lack of hazard recognition and lack of controls for hazards were the leading causes of accidents.

From 2016 to 2017, we endeavored to create a hazard recognition and control program, known as a Hazard Severity List and Life Critical Catalog process, to be used throughout our company. This is an adoption of a program originally created by the US military to reduce casualties in both combat and in training. Within DTE Biomass Energy, we were able to create over 450 JHAs which identified over one thousand different risks associated with the activities at each site. Most importantly, we were able to share risks and appropriate controls across several sites that had common equipment and environments.
The Waste Handling industry was the 5th most dangerous industry in 2016.

By adopting risk identification and control practices from another high risk profession, the military, DTE Biomass Energy saw a rise in hazard awareness and a corresponding rise in hazard controls.

For over two decades the US Army has required its front line leaders to identify and control risks prior to every training or combat event.

This culminates in a risk assessment prior to the activity and an After Action Review (AAR) following the activity.

Prior to performing any activity that involves Life Critical hazards or contractor work, DTE Biomass employees create and review a Job Hazard Analysis (JHA). Once the job is complete an AAR is conducted.
In the Landfill Gas to Energy industry there are a wide variety of tasks that vary considerably day by day with one employee having to work in many specialized areas. We found that when employees performed tasks that were non-routine, they were not stopping to think through the risks that may be associated with these tasks and how to control these risks. For example, an employee who was trying to remove a seized spark plug in an engine, failed to recognize the danger of torquing too hard on the spark plug, loosening the spark plug adaptor, and releasing hot coolant from the engine.

By creating a Job Hazard Analysis (JHA) prior to every event where Life Critical hazards exist, employees evaluate different sources of energy and risks that could be present and how to control them. Each site maintains its own Life Critical Catalog that contains all known hazards at the site that could reasonably cause a safety event. If a job contains a listed hazard or a task that could reasonably cause a safety concern, a JHA is created. All JHAs contain a risk matrix that allow the employees to risk rank each task with the knowledge that if a job is high risk that job cannot be performed until additional countermeasures are identified to reduce risk to an acceptable level. Each site maintains a list of all JHAs. This list is referred to as the Hazard Severity List and it shows at a glance the risk of the job. JHAs are shared across all sites and are reviewed in safety user groups on a routine basis.
Job Hazard Risk Assessment

1. The JHA that employees create requires a risk ranking of the task after controls are applied.

2. If the risk is high, additional controls are required to be applied until the residual risk can be lowered to 12 or less on the risk matrix.

Example of Job Hazard Analysis done by our Uwharrie Mountain Renewable Energy Site
Prior to the implementation of the Life Critical Catalog, sites did not have JHAs for the majority of tasks performed. In 2016, Biomass sites maintained 200 JHAs.

Each site maintains a Life Critical Catalog that is created by employees, managers and support staff and is broken into 8 hazard categories:

- Hazardous Materials
- Control of Hazardous Energy
- Confined Space Entry
- Working at Heights
- Lifting and Supporting Loads
- Hot Work
- P&I Life Critical
- Trenching and Excavation
- Vehicle Safety
Hazard Severity List and Life Critical Catalog Process

What results did you use as a baseline comparison between the old program and the program after the innovation?

Total JHAs for tasks performed at DTE Biomass.

Each site maintains a Hazard Severity list showing the JHAs that have been created. The lists are easily accessible by other DTEBE sites.
The new process implementation started in 2016 and included input from employees in the field during the development stages. After incorporating employee input, training was created and all personnel completed the training by the end of 2016.

In 2017, all employees implemented the process at their sites and uploaded completed Hazard Severity Lists, Life Critical Catalogs, and JHAs onto a shared website that allows the information to be cascaded across all sites.
The program helped ensure that JHAs were conducted for all Life Critical activities and that best practices were effectively shared across the organization.

The total number of completed JHAs increased by 125% within one year and field audits demonstrated the successful implementation of the program.

Additionally, the JHAs led to engineered solutions for high risk activities that either lowered the risk or eliminated an unnecessary activity.
Identifying a hazard and appropriate controls are the most critical steps in risk mitigation. Without understanding the hazards involved in a task, the work plan may not include adequate controls. By creating a standard practice and template, our employees are able to implement specific countermeasures for the work being performed, determine whether the risk has been properly mitigated, and share safety practices with others throughout the company and industry.

With the Hazard Severity List and Life Critical Catalog process, we have demonstrated an increase in the quality and number of hazards being reported for which engineered solutions have been executed. Additionally, these solutions are implemented across the company where similar equipment is in use.

Why do you think your safety program deserves this innovation award?

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