5S Implementation at Hamm Material Recovery Facility

2016 Award Entry

SWANA Best Safety Innovation

Charlie Sedlock
SWANA Member #17970
Hamm Waste Services
785.597.5111
charlie.sedlock@nrhamm.com

City of Lawrence, Kansas
Douglas County, Kansas
Population 120,000
I. EXECUTIVE SUMMARY

Hamm Waste Services (Hamm), based in Perry, Kansas provides integrated waste management services in Kansas and Missouri including the following services: collection, transfer stations, landfill, and a material recovery facility. Hamm implements programs and systems that improve our operations and safety in order to make waste services safer, more reliable, and more efficient. As part of its movement towards lean processes and increased safety, Hamm Waste Services has begun the process of 5S implementation at their Material Recovery Facility (MRF) in Lawrence, KS. The MRF 5S system improves housekeeping and organization of the facility and further intensifies employee focus on safety, operational process, and elimination of risk. This award submittal details the innovative 5S processes and implementation at the Hamm MRF and how this innovation can reduce occupational hazards and exposure in the industry.

II. INTRODUCTION AND COMMITMENT TO SAFETY

The Hamm Material Recovery Facility processes and markets single stream recyclables for surrounding cities and counties. The Hamm MRF operation and others like it present a unique and challenging environment in which the facility operator must juggle the variables of material quality and volume, automated machines/systems, rolling stock, and many personnel—all of which must be managed safely.

At Hamm, health and safety are cornerstone principles of our organization. Our sorters, operators, supervisors, and managers are our most important assets and their safety and health is our top priority. For our MRF, Hamm made the investment in MRF design and equipment selection to ensure that safety was factored into all aspects of the operation. As such, the MRF facility and equipment layout include the following safety by design elements: extensive worker and maintenance platforms, worker visibility, ANSI compliance, optimized machinery access, sorter ergonomics, and IBC compliant stairs/railings.

While facility design and equipment selection are important for a safe work environment, it is our process based safety program that is central to our commitment to safety. Employee engagement, risk assessments, audits, incident investigations, root cause analysis are all valuable process based tools that Hamm has employed for several years. However, we need to find new methods to make our work environments safer. This is where innovation comes into the equation and this requires new perspective and thought.

III. DESCRIPTION OF INNOVATION – 5S SYSTEM

Safety innovation can be either a new idea, equipment, or application that increases worker safety and reduces risk. It may involve using existing theory and technology from other industries applied to the waste industry. In our case, it is the application of the 5S system to the Hamm MRF environment during the 2015 calendar year. The intent of the program is to reduce slips, trips, and falls and further intensify our process based safety.
5S is a visually-oriented system of cleanliness and organization which fosters productivity and safety improvement. The highly visual nature of 5S makes it easy to see what is out of place. The 5S practice was borne out of the Japanese “Kaizen” management practice wherein working in disorder is considered neither productive nor safe. The Japanese words of the 5S system are Seiri (Sort), Seiton (Simplify), Seiso (Sweep), Seiketsu (Standardize), and Shitsuke (Self-Discipline). Safety is a core component within the context of the 5S methodology. Some safety professionals even argue that safety should be the sixth "S," while others believe that safety is inherent to the basic 5S methodology.

5S is Visual

5S is visually oriented, so everyone can tell in a glance that everything is in its proper place.
What are the 5S’s and what is the basic 5S methodology:

1. **Sort**: Remove unnecessary tools from the work area; keep needed tools in an easily accessible place.

2. **Simplify**: Arrange tools in an orderly workflow; "There's a place for everything and everything in its place."

3. **Sweep**: Keep the work area clean; ensure the area is in order.

4. **Standardize**: Promote interchangeability by using uniform procedures.

5. **Self-Discipline**: Ensure adherence to procedures.

IV. IMPLEMENTATION OF SAFETY INNOVATION: 5S METHODOLOGY AT OUR MRF

While we learned greatly during the process and made some mistakes, here are the general steps of implementation:

- Train managers and all employees about the importance and benefits of 5S and get their “buy in.”
- Start the implementation with one selected area or phase of operation.
- Conduct a status audit with photographs “as is state.”
- Develop an implementation plan and schedule.
- Implement the 5S plan.
- Take photographs after the implementation and assess the difference.
- Conduct periodic 5S Internal Audits with ratings to monitor progress.

In steps one through three, 5S is essentially a disciplined and thoughtful housekeeping activity wherein your team can "tell at a glance" what is right and what is out of place. In steps four and five, standard operating procedures are developed and the system is refined continuously.
Our 5S program is currently in the second and third level but this varies by operational phase at the MRF. The following photographs depict our 5S process:

Sort  
Straighten  
Sweep

Eight 5S Cleaning stations throughout the facility

Sort  
Straighten  
Sweep

Moved Tool Location from Tool Bench to Ballistic Separator in order to reduce exposure

Sort  
Straighten/Sweep

Organized MRF Equipment and Facility Manuals for easy access
V. DEGREE OF IMPLEMENTATION AND RANGE OF APPLICATION OF THE SAFETY INNOVATION

Planning for the MRF 5S began in November of 2014. We researched 5S programs to identify examples and implementation in other industries. The 5S system was implemented in January 2015 and Hamm has tracked progress since inception. Daily, weekly, and monthly discussions are conducted in order to identify necessary changes and maintain employee engagement.

The potential for applying this innovation across multiple programs or work sites is excellent. Our 5S solution is easily replicated and applied to common occupational hazards in a wide variety of operations in the waste industry, such as landfill, collection, transfer station, and maintenance shop.

Additionally, 5S programs are consistent with and work well within the constructs of the following management systems: process based safety; lean management; Six Sigma; and, Toyota Production System. 5S can be implemented without any of these systems and in any size organization. From small waste collection operations to large national waste firms, 5S can be implemented successfully.

VI. MEASURING THE 5S LEVEL OF ACHIEVEMENT

Hamm employs a 5S Score Card to track progress and measure results. The following photo depicts our wall mounted score card at the facility:
The following table tracks the 2015 audit score history and aggregates the years’ scoring by MRF phase and total facility:

<table>
<thead>
<tr>
<th>2015 MRF 5S Quarterly Scoring by MRF Phase and Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale</strong></td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1st Qtr</td>
</tr>
<tr>
<td>2nd Qtr</td>
</tr>
<tr>
<td>3rd Qtr</td>
</tr>
<tr>
<td>4th Qtr</td>
</tr>
</tbody>
</table>

During the internal 5S audits, specific and critical areas of the MRF are photo documented according to set photo documentation points.

The following schematic depicts the MRS shadowboard locations:

- ● = Photo Point
- □ = Shadowboard

MRF Layout with 5S Photo Documentation Points Shown

MRF Layout with 5S Shadowboard Locations Shown
VII. SAFETY, OPERATIONAL, AND MANAGEMENT BENEFITS.

The safety, operational, and management benefits of 5S are as follows:

- Housekeeping is a serious MRF workplace challenge. Our 5S solution helps to eliminate or reduce hazards and improves housekeeping efficiency improvements.

- Cleaner and safer work areas -- when a work area is clean and organized, tripping hazards and other dangers are eliminated. Our platforms and walking areas are cleaner and safer. It is simply more pleasant for workers as well.

- Less wasted time searching for tools and supplies -- when tools and materials are accessible and orderly, workers need less time to "go get" and less time to search. This is particularly important for our workers since they have more exposure as they traverse the plant for tools etc. With tools and cleaning supplies located at the point of need, the worker is able to simply perform the needed task without exposure to rolling stock.

- Required floor space is dramatically reduced. Spare parts storage and bale warehouse are safer and more efficient.

- Machine breakdowns are reduced since clean and well-maintained equipment breaks down less frequently. This dovetails with our maintenance program therefore extending equipment life.

- Improved self-discipline -- the 5S system, especially its visual nature, makes abnormal and unsafe conditions noticeable, which are leading indicators.

- Improved culture – people like to work in a well-organized and clean environment. In addition to safety and aesthetics, it helps with employee retention.
VIII. BASELINE GOALS AND REDUCTION IN ACCIDENTS, INJURIES OR FATALITIES

The following table depicts our goals in column one for each safety metric and the monthly results across the matrix.

<table>
<thead>
<tr>
<th>Goals</th>
<th>Metric</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RIR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>LTR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.58</td>
<td>CPI</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.52</td>
<td>PVIR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.11</td>
<td>Cost/ MH</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>Yellow Iron</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Near Misses</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

IX. REDUCTION IN EXPOSURE

As shown in the 5S safety benefits narrative, worker movement is minimized and exposure reduced.

The following illustrative figure depicts worker movement before and after 5S implementation.
X. CONCLUSION AND WHY HAMM SHOULD RECEIVE THIS AWARD

Over the years, innovation has provided the safety profession with numerous tools to help keep employees safe at work. We must continue in that direction. Hamm has proven through our innovative 5S implementation, that industry specific MRF hazards and exposure can be systematically reduced. 5S is not a single project with a beginning and end—we must continue to use it to examine our risks and enable our supervisors and employees to make their workplace as safe as possible. This takes creativity, innovation, and diligence—all of which Hamm has brought to the MRF business by implementing the 5S system. For that reason Hamm merits the inaugural SWANA Safety Innovation Award.

Hamm recognizes the safety professionals, waste industry veterans, and the references below who have elevated safety within the industry. Even with safety innovation taking place at Hamm, our safety practices stand on the shoulders of those who have come before us.

REFERENCES:

Harper-Franks, Kathy; The 5S for the Office User’s Guide
Hirano, Hiroyuki. 5S for Operators: 5 Pillars of the Visual Workplace
Ho, Samuel K. TQM: An Integrated approach
Osada Takashi, The 5S’s: five keys to a total quality environment
Lean Expertise, The 5S Implementation Process in Detail.
Becker J.E., 5S Safety
Bresko, Mike, 5S Method of Improvement-Enhancing Safety, Productivity and Culture