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www.wasteadvantagemag.com September 2012 Vol.3, No.9

WasteAdvantage^{magazine}

The Advantage in the Waste Industry and Recycling Industry



St. Landry Parish Solid Waste Disposal District: **Turning Landfill Gas Into Biofuel**

**Best Practices in Maintenance
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Recycling/Transfer Stations/
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Editor's Note



WASTECON 2012 HELD IN WASHINGTON, DC LAST MONTH WAS A GREAT SUCCESS! FROM

the packed awards breakfast to the busy exhibit hall and the crowded afternoon sessions, there was something for everyone. The SWANA awards breakfast was the highlight of the first day, with outgoing president, Jim Warner, making the opening remarks, and incoming president, Anne Germain, taking the reins and introducing the committees, technical division directors and recognition of distinguished guests. The focus then turned to highlighting the many 2012 award winners, including the Excellence Awards in Communication Education and Marketing, Collection and Transfer, Landfill Gas Management, Waste-to-Energy, Planning and Management, Landfill Management, Professional Achievement Awards, Chapter Awards and Faculty Awards. Afterwards, the breakfast crowd headed over to the exhibit hall where Jim Warner cut the ribbon and officially opened WASTECON 2012 to all attendees. With the opportunity to network in a great atmosphere, attendees and exhibitors alike were able to meet and talk about their technologies, ideas and exchange information. Virtually every booth had a visitor where their hosts answered questions and put on demonstrations as needed. Great conferences had many attendees eager to learn about the new ideas, best practices and hands-on experiences presented by the industry experts.

The second day featured keynote speaker, Sandra Cointreau, and a presentation on the industry game changers. The panelists shared their expertise with the audience as to where the industry is headed and what to expect in the next few years in terms of technology, regulations and best practices. Taking questions from the audience, the session was an interactive and dynamic session that left people wanting to discuss further issues not only with the panelists, but amongst themselves. Rather than holding sessions in a separate part of the building, the Blue and Green Rooms on the exhibit hall floor provided a great venue to keep people involved in the show while still in a learning mode. Finally, day three of WASTECON saw a relaxed atmosphere with both the exhibitors and attendees alike. Although the hall hours were shorter, the afternoon was topped off with dynamic sessions, which were full of those wanting to learn more details about innovative best practices from other industry experts.

We appreciate everyone who stopped at *Waste Advantage Magazine's* booth to chat with us about the publication, article ideas and more. We always look forward to speaking with you! In the meantime, enjoy this issue. It features a great spotlight on St. Landry Solid Waste Disposal District, who has begun to turn their landfill gas into biofuel (page 14). Other highlights include best practices in maintenance (page 20), choosing the right camera backup system (page 26), continuously improving your safety culture (page 37) and more. As always, feel free to contact me with any questions.

Best Regards,
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TODD EFIRD, CSP



On the Cover:

St. Landry Parish Solid Waste Technician, Faltry Jolivet, initializes the new BioCNG dispensing system at the Parish Landfill in Beggs, LA. Photo courtesy of the St. Landry Solid Waste Disposal District.

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Trash Talk



Waste Pro Opens Doors to First Compressed Natural Gas Garbage Truck Fueling Facility in Ft. Pierce, FL

WASTE PRO's (Longwood, FL) first compressed natural gas fueling facility officially opened its doors at a ribbon cutting ceremony and reception held August 8. The new complex is the first of its kind in the area. The ceremony was attended by representatives from

Waste Pro's corporate office, Clean Energy, Culpepper & Terpening, Inc., and many city and county elected officials.

The facility includes more than 20,000 square feet of administrative and operational space, spanning approximately seven acres. The facility is able to fuel 80 compressed natural gas vehicles at full capacity simultaneously, and can service both Waste Pro trucks as well as compatible vehicles from surrounding

municipalities." The \$15 million project is one phase of Waste Pro's \$100 million total investment towards the transition to the environmentally friendly and domestically available CNG fuel, which was announced late last year.

For more information, call (407) 869-8800 or visit www.wasteprousa.com.

World's Largest and Most Extensive Material Processing System is Open for Business

REPUBLIC SERVICES, INC. (Phoenix, AZ) has officially flipped the switch on the world's largest recycling operation, which can process up to 110 tons-per-hour of multiple waste streams, and sets a new standard for the recycling industry. The facility will process all of the commercial waste generated by businesses in San Jose, CA. In addition, the facility is expected to divert at least 80 percent of material collected.

Republic worked with Bulk Handling Systems to design, manufacture and install the custom-designed, highly-automated system. "Republic is pleased to be working with BHS on this extraordinary project," says Mark Buntjer, general manager at Republic. "This facility is the first and largest of its kind and we're excited to be at the forefront of the industry, setting the pace globally for multi-material recovery."

For more information, visit www.republicservices.com.

MRC Polymers Introduces New Recycling Solutions Division

MRC POLYMERS (Chicago, IL) has launched its latest effort to tackle the biggest issues facing the recycling industry. With a new team of creative engineers, MRC's Recycling Solutions Division seeks to break industry barriers and help companies derive the highest value possible from "waste" materials, benefiting bottom lines and saving natural resources at the same time. Many companies are looking for ways to reduce the carbon footprint of their products, and closed-loop recycling will help them achieve this goal. A major area of concern is the amount of plastic being exported overseas. MRC believes plastic is a valuable natural resource since it is manufactured from fossil fuels and should remain in the US. Recycling plastics saves about 70 percent of the energy required to produce new plastics and creates more jobs than landfilling. MRC's Recycling Solutions Division is the next step to a more sustainable future in U.S. manufacturing.

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25 – 26: 2012 NSWMA South Central Annual Conference

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San Antonio, TX
www.environmentalistseveryday.org

30 – October 3: Global Waste Management Symposium

Arizona Grand Resort
Phoenix, AZ
www.wastesymposium.com

OCTOBER 2012

1 – 3: 2012 Iowa Recycling and Solid Waste Management Conference

Coralville Marriott Hotel and Conference Center
Coralville, IA
www.iowaconference.org

2 – 3: 2012 NSWMA Mid-Atlantic Annual Conference

The Homestead
Hotsprings, VA
www.environmentalistseveryday.org

5: SWANA New Jersey Chapter Annual Chapter Meeting & Golf Tournament

Mountain View Golf Course
Ewing Township, NJ
www.swanachapters.org/newjersey

10 – 11: Biogas USA West

Sheraton Fisherman's Wharf Hotel
San Francisco, CA
www.greenpowerconferences.com/biogaswest

14 – 16: Paper Recycling Conference & Trade Show

Marriott Downtown Magnificent Mile
Chicago, IL
<http://americas.paperrecyclingconference.com>

15 – 17: NSWMA/Wastec before Executive Roundtable Conference 2012

The Ritz-Carlton, Laguna Niguel
Dana Point, CA
www.environmentalistseveryday.org

18 – 20: Resource India Expo 2012

Palace Grounds
Bangalore, India
www.resourceindiaexpo.com

19 – 21: BIT's 1st Annual World Congress of Greentech

Guangzhou Baiyun International Center
Guangzhou, China
www.bitcongress.com/Greentech2012

23 – 24: Northeast Recycling Council Fall Conference

Hotel Northampton
Northampton, MA
www.nerc.org

24 – 26: Coast Waste Management Association 2012 Annual Conference: EPR – The (R)Evolution Continues

Fairmont Empress Hotel
Victoria, BC
www.cwma.bc.ca/events/2012/conference/default.htm

29 – 31: 12th Annual Conference on Renewable Energy from Organics Recycling

Marriott St. Louis Union Station
St. Louis, MO
www.biocycle.net/conferences/renewable-energy-2012

29 – 31: Advanced Biofuels Market: The Race for Scale

Parc 55 Hotel
San Francisco, CA
www.advancedbiofuelsmarkets.com

NOVEMBER 2012

12 – 13: 2012 Southeast Food Waste Reduction Conference

Hilton University Palace
Charlotte, NC
<http://cra-recycle.org/foodwasteconference>

10 – 11: Biogas USA West

Sheraton Fisherman's Wharf Hotel
San Francisco, CA
www.greenpowerconferences.com/biogaswest

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Government Gossip



Waste Haulers Laud Governor Quinn for Signing Bill Strengthening Waste Management Practices and Recycling Standards

The NSWMA – Illinois Chapter (NSWMA-IL) applauds Governor Quinn for signing legislation strengthening environmental protections and establishing stronger oversight of the recycling and waste management practices in Illinois. House Bill 4986 establishes the Task Force on the Advancement of Materials Recycling in an effort to ensure that

current practices are efficient and to identify new ways in which waste materials may be used.

The task force, made up of 21 appointed members including legislators, economic and environmental agency representatives and industry professionals, will analyze recycling and waste management policies, initiatives and funding in Illinois. The task force will then report their findings and recommendations to the Governor and General Assembly for proposed policy changes to current operations. The bill sets the stage for

better industry standards and sets the precedent for recycling and composting standards each county is required to meet in their established waste management plans.

For more information, visit www.illinoisgarbagefacts.com.

New Forms and Procedures for Submitting Compliance Reports to EPA

EPA's Office of Transportation and Air Quality announces that compliance reports submitted after August 31, 2012 must be submitted via EPA's Central Data Exchange (CDX). The substance and format of the reports is unchanged. EPA is switching to all-electronic reporting using CDX because it is simple, cost-effective, and will improve the availability and integrity of data. As of August 31, 2012, parties will no longer be permitted to submit reports via portable electronic media, such as CDs or diskettes. This notice affects parties subject to reporting requirements under 40 CFR part 80, including requirements pertaining to reformulated gasoline, anti-dumping, gasoline sulfur, ultra-low sulfur diesel, benzene content and the renewable fuel standard. This notice also affects parties subject to greenhouse gas reporting requirements related to coal-based liquid fuels and petroleum products under 40 CFR part 98, subparts LL and MM.

For more information, contact Anne-Marie C. Pastorkovich, Attorney/Advisor, EPA, at (202) 343-9623 or via e-mail at pastorkovich.anne-marie@epa.gov.

OSHA Issues Two Educational Resources on Protecting Workers From Mercury Exposure in Fluorescent Bulbs

OSHA has issued two new educational resources to help protect workers from mercury exposure while crushing and recycling fluorescent bulbs. Compact fluorescent bulbs are more efficient than incandescent bulbs, but the shift to energy-saving fluorescents, which contain mercury, calls for more attention to workers who handle, dispose of and recycle used fluorescent bulbs. The OSHA fact sheet explains how workers may be exposed, what kinds of engineering controls and personal protective equipment they need, and how to use these controls and equipment properly. In addition, a new OSHA Quick Card alerts employers and workers to the hazards of mercury and provides information on how to properly clean up accidentally broken fluorescent bulbs to minimize workers' exposures to mercury.

For more information, visit www.osha.gov.

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St. Landry Parish Solid Waste Disposal District: Turning Landfill Gas Into Biofuel

One of the pioneers in biogas use, St. Landry Parish Solid Waste Disposal District has USED ITS LANDFILL GAS TO FUEL VEHICLES IN THEIR LOCAL SHERIFF'S DEPARTMENT.

BORN OUT OF THE NEED TO DEAL WITH OPEN DUMPS IN THE

late 1970s, the St Landry Parish Solid Waste Disposal District's purpose was to deal with the growing problem. Before its creation, waste was collected by a multitude of local haulers who took the waste to one of many open dumpsites. Then, in 1980, the St. Landry Parish Government, formerly the St. Landry Parish Police Jury, along with the Parish's 12 municipalities, petitioned the Louisiana legislature to create the St. Landry Parish Solid Waste Disposal District in accordance with 1979 state law, which required the cleanup of all open dumps by January 1986. The District continues to be governed by a board of commissioners, appointed by local elected officials meeting monthly to address ongoing solid waste problems (see Commissioners sidebar, page 16).

Now serving a population of 110,000 residing in St. Landry and Evangeline Parishes (South Central Louisiana), the Solid Waste



St. Landry Parish Solid Waste Technician, Faltry Jolivet, initializes the new BioCNG dispensing system at the Parish Landfill in Beggs, LA.

Photos courtesy of the St. Landry Parish Chamber of Commerce.

Disposal District specializes in comprehensive disposal and waste diversion practices, including traditional recycling initiatives. The District employs 28 full-time staffers engaged in landfill operations, recycling collection and processing, general administration and public education.

Strong and Steady

During this turbulent economy, the St. Landry Parish Solid Waste District has not been adversely affected, although Katry Martin, the District's Executive Director, does point out that there has been slightly less waste generated due to the slowdown in construction activity over the last three to five years. The District's waste acceptance rate has really not varied significantly either way. "Local sales taxes fund the bulk of operations in our Parish. Those sales taxes have not varied significantly," says Martin. "In fact, they have actually rebounded since 2008, so we haven't had any real deviation in our revenue source that we use to deliver programs and services."

What Martin finds is that most of the District's attention is directed specifically to regulatory issues, recently dealing with greenhouse gases and greenhouse gas reporting—requirements that have been imposed by the EPA. "We find that our biggest challenge is keeping up with regulatory matters that are constantly changing and the costs associated with that." Very active on the regulatory front, the District keeps informed of all the changes in State and federal laws by attending most of the industry conferences that are available. In addition, employees are trained, licensed and certified in operating and maintaining landfills, and they also keep the District up-to-date on any changes or updates to the regulatory code. Martin says, "At every turn, we attempt to find some

way to monetize environmental attributes available through certain practices. For example, we monetize carbon credits created from voluntary greenhouse gas reductions," says Martin. "The destruction of potent gases in advance of regulatory requirements will allow the District to market the offsets, developing a revenue stream to aid in saving on capital costs directly related to regulatory compliance." Martin also points out that finding a valuable use for landfill gas will also develop a revenue source that will continue to aid in offsetting costs. The District invests in technologies that provide less costly ways to comply with strict regulations. In addition, savings are derived by performing environmental tasks in-house such as waste water sampling and analysis.

Interweaving Training and Safety

Not only does the St. Landry Parish Solid Waste Disposal District outsource professional training, but they also invite professionals from the field in-house on a quarterly basis to go over training material on disposal and waste reduction practices. The District is also an affiliate of the State and national associations that provide additional training resources, including the Louisiana Solid Waste Association and SWANA. Martin points out that their operators are certified through the State solid waste association at different levels depending on work requirements and classes, and that they have supervisors that provide professional training in the areas for which they are responsible. "All of the employees have the opportunity to attend classes and approximately half are required to be certified, which is also a part of the job requirement; the other half do so on a voluntary basis, so we support these efforts. They voluntarily train because it is reflected in their pay grade," says Martin.

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The district takes delivery of the sulfur treatment vessel, a part of the biogas conditioning system.

St. Landry Parish Solid Waste Disposal District: Turning Landfill Gas Into Biofuel

At the same time, operational training is interfaced with the District's safety programs. Martin states that the conferences and internal training both provide knowledge on the field of expertise as well as the safety associated with all of these activities. Therefore, safety is incorporated with their training and both have been done on a monthly and quarterly basis.

Community Involvement

With a very aggressive outreach and educational program for both school students and adults, St. Landry Parish Solid Waste Disposal District provides professional educational material for elementary schools in the Parish. The teaching material is tailored so that it coincides with reading, math and science skills. For example, it may involve calculating the value of recycled material or discuss citizenship and stewardship as it relates to litter campaigning, etc. Since this educational material meets the State educational requirements for lesson planning, it is incorporated into all of the elementary schools via the school board and the local principals. "We have found this material to be tremendously successful and have had high levels of educators who use this teaching material quantify and recognize high levels of recycling participation," says Martin. Monitoring the recycling of all 50 institutions that they partner with, the District also provides teaching material through an annual calendar on environmental and waste management practices in the Parish that is delivered to students and faculty members.

The District also hosts more than 1,000 students, teachers and parents each year at their facilities and coordinates with fairs and festivals as well to provide recycling containers and booth space in order to present information about their waste management practices. Martin says that they also have a number of gardening clubs, as well as plant and home festivals that they attend where they are well received by the community. "Those who are knowledgeable about the solid waste program are always fascinated about what is happening in our organization. Being a public jurisdiction, we certainly are answerable to the general public," says Martin.

The Biogas Project

St. Landry Solid Waste Disposal District operates a type II municipal solid waste landfill, which was permitted to begin operations in 1986. Receiving approximately 400 tons of waste each day, six days per week for nearly 30 years, the total waste in place equals to 2.75 million tons. Back in late 2008, the District saw fit to invest \$750,000 in a landfill gas collection system with the intent of marketing the carbon reductions and using the proceeds to pay for the cost of the system. Since then, the commission has developed gross sales of \$750,000. Martin points out, "What is unique about St. Landry Parish is that all of the investments in the gas system were funded by the District, not by any project developer from the outside. In addition, it has continued operation debt-free and all maintenance is done in-house." Now, not only does the district own and operate a successful gas collection system, but it has also opened up the opportunity to find a beneficial use for the gas, specifically the recently completed biogas project.

In 2011, the choice was made to develop a vehicle fuel project based on a complete evaluation of all the potential uses for landfill gas in the District's region. "Nothing that was considered outside of the vehicle fuel project was deemed to be economical. We could not recover enough on the sale of generated power to offset the investment costs. It was possible, but it wasn't feasible. It also wasn't practical to convey the landfill gas 12 miles to the next buyer for gas or heat, particularly since natural gas prices are cheap in Louisiana. We were being opportunistic by looking to clean the gas and compress it in such a manner that it would be delivered as CNG or BioCNG for vehicle fuel," says Martin.

At the time, only one other system had been installed at a U.S. landfill (Madison, WI) and on an animal waste digester in Janesville, WI, both small scale. Martin

Commissioners

Nine Commissioners are appointed to oversee the St. Landry Parish Solid Waste Disposal District. The commissioners are appointed as follows:

- Four commissioners are appointed by St. Landry Parish Government
- Four commissioners are appointed by the various municipalities
- One commissioner is appointed by the St. Landry Parish Municipal Association

The commissioners serve staggered four-year terms. The Commissioners hire an Executive Director (Katy Martin) to oversee the operations of the District. As of March 2010, the Commissioners are:

- | | |
|--------------------|--------------------|
| • Kathy Moreau | • Cyrus Auzenne |
| • Jerry Domengeaux | • Edward Briscoe |
| • D.L. Vidrine | • A.F. Pete Oliver |
| • Eddie Godwin | • Jodie Powell |
| • Gardie McManus | |






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St. Landry Parish Solid Waste Disposal District: Turning Landfill Gas Into Biofuel

points out, “Collecting, cleaning and using landfill gas is not new, but using the landfill gas as a biogas to fuel vehicles is new. The use of CNG in general is growing in popularity, particularly in regions where natural gas is cheap. There is a lot of interest in subsidies made available for municipal jurisdictions to fuel their trucks and refuse vehicles with natural gas. In those facilities, they bring in the natural gas through a pipeline whereas in our facilities, we created our own natural gas from landfill gas.”

The District invested \$850,000 in capital with assistance from federal and State sources to install a conditioning system, compression unit and a CNG fueling dispenser. The cost to convert 15 fleet vehicles amounted to approximately \$200,000, just over 10,000 per vehicle, and the remaining costs went to the purchase and the installation of the dispensing system. Martin stresses that the District could have chosen to use their resources to fully fund the project, but they felt it would be more practical to use the subsidies available to them to offset the capital cost. “It was our responsibility to acquire some subsidies in order to aid in the cost of the capital. Funding was available, it was just important that we leveraged a portion against State and federal sources,” says Martin.

The District ended up drawing from the talents of individuals who have provided services to them over the years. For example, they called upon the consultants who do the District’s air quality work. They also drew from the carbon developer that handles their carbon offsets and carbon marketing to aid the District in the review process. In addition, they located a company who would develop the technology to deliver and dispense the biogas and required that their engineer who designed (and continues to maintain) the disposal site be a project coordinator in order to make sure that they met all of their State bid requirements. Finally, they relied upon the Department of Natural Resources to administer some funding made available through the Department of Energy. And they were fortunate enough to have a local company who was just beginning to provide conversion service and the technology to convert the vehicles. “Most importantly, our Commissioners as well as our technicians served as project managers,” says Martin. “We did the entire site work ourselves and we managed the gas collection. From my perspective, I think this is as a unique situation as you’ll find. We have had to pioneer through most of this. We’re not experts but we do know who to call and how to educate ourselves. However, we find that we don’t have a lot of latitude when it comes to success and failure. If we are not the 24/7 service company for our own system, we have to rely on those outside who may not have as much vested interest or who may not deliver—then the project may not be as successful.” Martin says that they also make sure to carefully watch the treatment and conditioning of the landfill gas. Biogas is a dirty gas and the greatest cost is in maintaining the filter component, so they are working through different types of filter media and its life expectancies.

As far as choosing the first vehicles to be converted, the District was excited that the local Sheriff’s department was willing to provide a significant part of their fleet for the project. Since the Sheriff’s Department has the largest single fleet in St. Landry Parish, the District thought it would be very advantageous to fuel their vehicles with CNG, especially since gas rates were approaching \$4.00 per gallon. Says Martin, “The Sheriff’s fleet consumes a large amount of fuel. We negotiated with the Sheriff and agreed upon a flat rate per gallon while providing the cost of vehicle conversions. He just needed to provide the fleet and sign a purchase agreement.” In addition, some of their small service vehicles used for maintaining the landfill were converted as well. So far, says Martin, everyone is very happy with the results. “This project was well-conceived and we think we kept everything within manageable size and scope. The Commission agreed to accept the funding in July 2011 and we were fueling vehicles in March 2012.



St. Landry Parish Director of Tourism, Celeste Gomez (left), and State Representative, Ledrika Theiry (right), are pictured at the commissioning of Louisiana’s first BioCNG fueling station located at the St. Landry Parish Landfill.

From July 2011, the District went through the planning process, operations, acquisition of the equipment, installations, training, etc. We now like to say that we were successful in the ongoing treatment and delivery of compressed biogas and we are determined to continue to make this thing work. If it continues to be successful, we will consider some modest expansions.” Opportunities for further development are in conceptual stages right now, including expanding the use of the available landfill gas. Even though the District has fuel for 500 vehicles, they are only using it for 15, so they have plenty of capacity to expand. However, Martin points out that the new technology is expensive. “We have to continue to find some subsidies or other funding where we can get a return on the capital that is suitable for public investment.”

Continuing Pioneers

Without question, the St. Landry Parish Solid Waste Disposal District’s biggest success in the last few years has been the biogas project. Although, Martin points out that there have been other things that they have done that they are proud of, including being the first to line the landfill in advance of new regulations. And, in the last two decades they have worked on the forefront regarding waste reduction practices and recycling. Most Parishes have some recycling programs, but St. Landry has a routing and collection system; it also provides the processing and marketing as well. “Determining where we might go from here is our biggest challenge right now. We will continue to develop vehicle fuel even further and we may have an opportunity to develop a high BTU project and inject biogas into a natural gas pipeline. Beyond that, we will continue to keep our ears and our eyes open at the new technology conferences as it relates to further reducing waste, waste management and landfill gas management. We are contemplating curbside service to our constituents, but we want to do so in a select manner. We don’t want to just open that door to the high cost of transportation that will compromise our recycling initiative. These are a few items that we will continue to develop further.”

For now, the St. Landry Parish Solid Waste Disposal District continues to be very proud to have been pioneers in the biogas area. Says Martin, “It is usually common for large facilities to excel in these areas. You find things like this happening in places that can host outside investors and developers or have large amounts of waste and landfill gas. There is less margin for error. We think our success is resounded in the fact that we’ve done so on a smaller than average site, which is most uncommon.” | **WA**

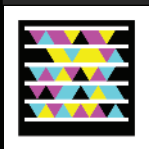
For more information on the St. Landry Parish Solid Waste Disposal District, contact Katty Martin at (337) 826-5211, via e-mail at kmartin@slpsolidwaste.org or visit www.slpsolidwaste.org.

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Best Practices in Maintenance For Waste Handling Fleets

Dave Walters

With a fully operational, deployed and comprehensive maintenance software system, COMPANIES CAN INCREASE THEIR VISIBILITY TO COSTS AND OPERATIONS PERFORMANCE.

BUSINESS PROFITABILITY IS MEASURED BY A variety of factors, from the amount of sales and service income to decrease (or increase) in administrative and operating expenses. For waste handling companies, fleet maintenance can represent a significant outgo in the last category. Using best practices can help control maintenance costs while extending the useful life of this valuable asset.

But what do “best practices” encompass? In the maintenance arena, best practices encompass a variety of areas, including inventory control, purchasing, repairs and, of course, maintenance: corrective, proactive, predictive and preventive. Another component involves potential environmental issues—a concern for onsite vehicle servicing that could involve materials such as waste antifreeze, brake washing solvent and any F-listed chemical. Implementing appropriate practices and procedures combined with ongoing monitoring and tracking ensures appropriate disposal of any toxic or hazardous substances as defined by the EPA, and prevents any fines or citations associated with failure to comply.

While it is possible to use a manual-based tracking system versus maintenance software to monitor maintenance schedules, the initial dollars saved will soon be spent, thanks to the inherent inefficiencies. Typical man hours increase approximately 10 to 20 percent, primarily driven by the size of fleet and scope of back office functions required when using a manual paper-based tracking system. Substantial cost saving benefits quickly become actionable when you switch from a manual system to a fully integrated maintenance software package.¹

Reducing man-hours is clearly one benefit. But a second advantage can be attributed to ensuring the health of the very equipment that the company relies on. Without a comprehensive and automated

maintenance program, companies run the risk of turning their equipment too soon, with a negative impact on their equipment lifecycle costs.² However, using maintenance software means companies can keep their trucks running longer by ensuring that needed maintenance is performed on schedule. This eliminates the need to invest in new vehicles earlier than planned due to the consequences of inadequate servicing.

For waste handling companies committed to using best practices for fleet maintenance, the key is to implement a method that will increase efficiency, provide relevant reports on an as-needed basis and integrate all aspects of the operation into a coordinated, comprehensive system—a solution that can be as close as the company’s computer system. As for ROI, this can result from a variety of areas: money saved by better control over parts ordering and inventory, reimbursement from on-time submission of in-warranty claims, longer life for equipment due to on-time performance of necessary maintenance (both preventive and corrective), and reduced administrative expense due to reduced man-hours inputting information.

For those estimated 75 percent of waste handling fleets who have not yet converted to software-driven maintenance schedules, it is recommended that you first review all of the available modules in a software package and compare them against current needs. Not all the modules are necessary, especially at the beginning. Fleets can always grow into new modules as they improve their software skills.³

Key Modules in Maintenance Software

When evaluating options for fleet maintenance software, it should provide full integration of all



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maintenance activities currently in place as well as allow for expansion as the needs increase. Information should be tracked in real-time and be available remotely via Web browser. Key capabilities include inventory, maintenance and order management, fuel management, warranty management, customer billing, reporting (encompassing alerts, notifications and key performance indicators), and shop planning and scheduling. The software should offer both a wide range of standard financial and operational reports, with the option to create custom and specially configured new reports, and to make that information accessible by Web browser.

Maintenance Management

Like any vehicle engaged in a frequent stop-and-go operation, waste handling trucks pay the price in increased wear on brakes, tires, suspensions, hydraulics/body, cooling systems and electrical systems. Also, the typical collection vehicles will have a mechanism to compact the material to aid in the efficiency of waste collection. This means that the truck is likely to be exceptionally heavy which also contributes to maintenance issues on crucial components.⁴

Preventive maintenance should be the cornerstone of a company's maintenance program, supported through a strict preventive maintenance schedule. A preventive maintenance program should be supported by a maintenance software and team of dedicated employees. This will allow the company to take a proactive position on how, when and where maintenance is performed. In the waste handling business, brakes and

tires represent a major cost segment. Through consistent inspections, maintenance software can improve vehicle use, safety and reduce lifecycle costs across the fleet.⁵

When maintenance software is used in the planning, scheduling and completion of maintenance with frequent brake and tire inspections, the brake and tires inspection process can improve route downtime to under 1 percent of route hours and can reduce historical road call rate by 17 percent. The software provides the information to schedule and complete repairs before failure, which is 40 to 60 percent less expensive than an after failure repair.⁶

Performing scheduled maintenance will maximize the reliability, performance and lifecycle of the equipment. As an example, a small engine leak missed on an inspection can result in a major engine repair. The result of this improper maintenance practice can permeate into other aspects of the business and often requires additional equipment and labor to satisfy high customer service standards. Often the older and slower spare needs to be used in place of the front line vehicle. It is not uncommon for a normal total-per-hour operating cost to more than triple when all aspects of failure are included in the cost model (road calls, tows, additional labor, etc.).⁷

Judging the success of your maintenance program is as basic as comparing two figures, the number of units running versus the number of units getting repaired. Between PMs [preventive maintenance], it's called "frequency for truck repair." The greater the frequency, the worse a maintenance program is working, while the lesser the frequency, the better it's functioning.⁸

But the software can be used for far more than just tracking PM-related tasks such as oil changes and tire rotations. The ability to capture and manage data through maintenance software can position fleet staff to perform root cause failure analysis, manage inventory and procurement, measure equipment use, and identify and collect warranty dollars in a professional and organized manner. The use of software minimizes the effort and time associated with finding meaningful data and statistics in the system to maintain DOT compliance on an ongoing basis—information that provides companies with the necessary documentation to successfully navigate their way through a DOT compliance audit.

A greater benefit can be noted in the event of an accident that leads to litigation against the company for damages. The software provides accurate comprehensive documentation to prove full compliance with the local, State and federal motor carrier safety regulations.⁹

Inventory and Order Management

A well-run parts department has what mechanics need to keep vehicles operational and prevent rush-order delivery while avoiding excess inventory and outdated parts. Automating the purchasing, ordering and inventory process through software use enables companies to control unnecessary parts inventory expenses while establishing reorder tolerance levels. When used in conjunction with touch-screens, and barcode readers and an interactive, workflow-based user interface design, maintenance, parts and labor charging are facilitated, while reducing data entry time and improving data integrity. Add an accounting/general ledger interface capability, and the process is further streamlined, thanks to an "input once/access system-wide" software design.

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Fuel Management

Given the unpredictable status of fuel prices, companies need a real-time tracking method to know where, how and why each fuel dollar is spent. The fuel management module can interface with all fuel management systems, providing instant meter updates, fuel cost per mile/yard/hour/tons or user defined measures, fuel tax reports, fuel/oil cost per individual piece of equipment, site fuel inventories and vendor fuel purchase histories.

Also linked to the global prices for oil are the costs for the lubricants that are critical to vehicle operation and fuel efficiency. By extending oil drain intervals through state-of-the-art filtration systems and taking the oil sampling program to the highest level, the fluids are changed on condition-based intervals. This practice can reduce oil consumption by 45 percent and allow maintenance staff to perform repairs prior to failure.¹⁰

Warranty Management

Warranty-related reimbursement is a commonly missed issue. Everything on a truck has a warranty, but companies usually collect less than 5 percent of recoverable warranty dollars.¹¹ Companies need to know the extent of their vehicles' coverage and then ensure that they recoup those dollars spent during vehicle acquisition by submitting all warranty claims—a task that can be

arduous and time-consuming with a manual system but efficient and accurate with a software-driven warranty module.

With a warranty module, every unit, system or component under warranty is tracked and daily warranty reports and claims status are issued for all warranty opportunities. Another advantage lies in the software's ability to identify high- and low-performing products through its failed parts analysis and claims analysis.

Management Reporting

A management reporting module can deliver budget analysis, maintenance cost trends, shop labor analysis and facility cost, as well as record equipment inventory, specification details, component specifications and drive equipment cost comparisons. It also can be customized to issue notifications when license permits and inspections are approaching the expiration date.

Reduce Costs and Improve Efficiencies

When deciding to implement a maintenance software system, companies need to take into account the hardware and software costs as well as the necessary employee training. Customer support from the vendor is also a key factor, as well as the frequency of upgrades that serve to improve the software's ability and operation. A vendor that offers "rolling releases" for software updates is preferred,

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versus those requiring software re-installations with each major update, which can cause significant downtime or personnel retraining issues. Companies might want to consider managed service hosting environments for maintenance software, to speed implementation or lower their IT support burdens.

Ultimately, with a fully operational, deployed and comprehensive maintenance software system, companies increase their visibility to costs and operations performance. This enables them to make management and operational decisions that reduce operating costs, assets and capital employed as well as to automate the maintenance lifecycle.

Implementing best practices in fleet maintenance management, supported by a comprehensive and robust maintenance software program, allows waste handling companies to reduce costs and improve efficiencies. By increasing performance and productivity with higher delivery rates through fewer breakdowns, maintenance shops are on their way to transforming from cost centers to revenue generators. | **WA**

Dave Walters is Technical Sales Consultant for TMW Systems (Beachwood, OH) and has more than 30 years of experience performing and successfully managing maintenance operations at industry-leading trucking companies. He can be reached at dwalters@tmwsystems.com.

Notes

1. Gary R. Simmons, Vice President, Fleet Management for Rutland, Vermont-based Casella Waste Systems, Inc., whose company converted from a manual system to a software-driven one.
2. Ryan Knight, Regional Sales Manager for TMW Systems, Asset Maintenance Software.
3. Ibid.
4. Gary R. Simmons.
5. Ibid.
6. Ibid.
7. Ibid.
8. Ryan Knight.
9. Gary R. Simmons.
10. Ibid. Improving fuel efficiency and going "green" are twin goals for many fleet operations. At Casella, Simmons noted that his company has "made a long-standing commitment to ourselves and our customers to reduce our environmental impact in all aspects of our business. In 2010 we began introducing CNG powered vehicles in the place of traditional diesel engines to reduce our carbon footprint in the areas we service."
11. Ryan Knight.



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Choosing the Right Backup Camera System

Matt Van Kirk

By doing your homework, setting high standards and keeping the future in mind, you will end up with a backup camera system that is RUGGED, RELIABLE AND ABLE TO GROW WITH YOUR BUSINESS.

BACKUP CAMERAS ARE BECOMING THE NORM IN

the waste industry these days. But with so many options on the market, and each with their own set of features, how do you determine which system is right for your application? This is a question that plagues many operations, and mistakes can be costly, particularly when one is looking to outfit a large number of vehicles. But regardless, if your operation is large or small, the need for reliable, easy installation and maintenance, and cost-effective backup assistance remains.

Durability

Commercial rear vision cameras that are built to withstand the day-to-day use/abuse that the commercial waste industry can throw at them are vastly different from the camera on the SUV in your driveway or the RV you take on vacation. Commercial cameras are designed and built specifically to endure the rigors of the waste industry all day, every day, all year long, as you run your routes.

Hardwiring

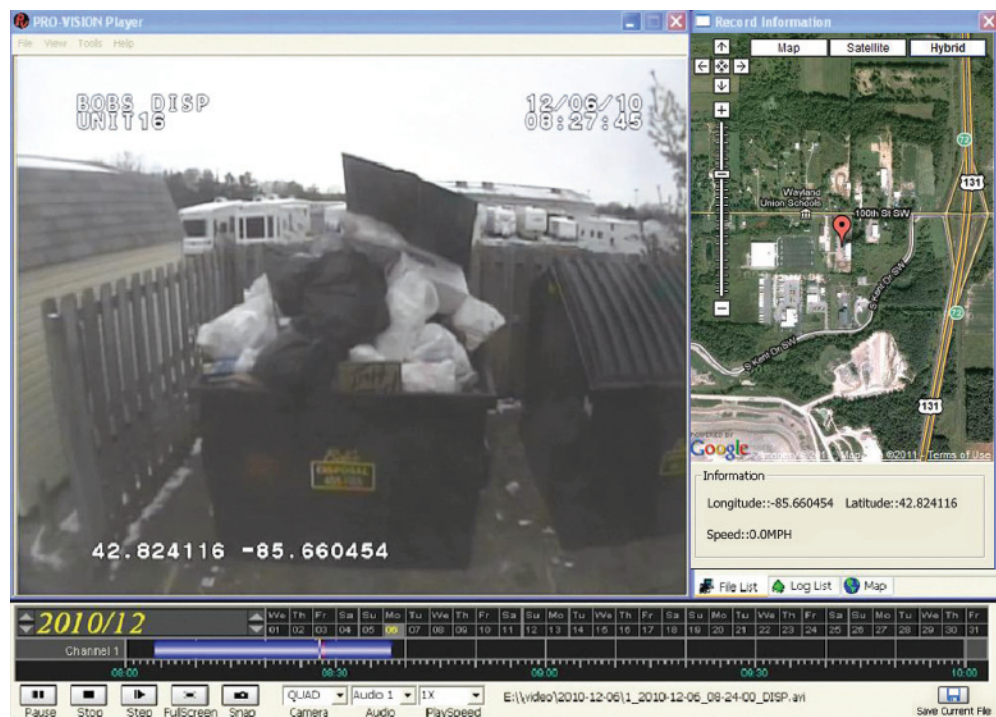
Most of these systems are hardwired, and for good reason. When safety is one of your primary goals, the last thing you need is a camera system that starts having interruptions or interference while you are trying to use it. If you can't rely on your system to work when you need it, what's the point? Your camera system should be there for you at all times. Hardwired systems decrease the probability that you will encounter the interference that so many wireless systems are plagued with. With a large metal truck, boat or train full of electronics, there are numerous opportunities for interruption and interference, and who's to say when that is going to occur? By hardwiring your system with shielded cables and connections, your chances of interference are all but eliminated.

Versatility

The camera system you select should offer a wide variety of monitor and camera options including night vision and low light capable cameras. This will allow you to pick various solutions to work for your entire fleet, all from one source, no matter what style loader, truck, trailer, container, barge or railcar you use. In addition, the mounting options offered should allow you to mount your components and get the view you need easily without having to create a custom bracket or weld a variety of attachments onto your equipment.

Endurance

Having a system that fits your needs is just the starting point. Once you have found a commercial camera system that meets your fleet's demands, you then have to consider the environmental conditions the components themselves will have to endure. While most commercial systems can handle average precipitation and temperature, you have to factor in the extremes, since that is typically when you rely on your cameras the most. You should look for a system that works in all climates ensuring that it is rated to be airtight and



An overfilled bin; image used for additional billing purposes. Images courtesy of PRO-VISION.

waterproof. This rating is typically referred to as an IP rating for protection from solid objects or materials and liquids. You want a camera rated no less than IP67K on this scale to protect from dust and dirt as well as pounding rain and heavy snow. However, it is not just your cameras that need to be protected from the environment. Your cables and connections should be just as robust. Be sure that your system comes with shielded heat and cut resistant cables as well as deep collared, metal screw-type connectors with waterproof sleeves to cover the connection. These will help to ensure that your connection is secure even in the worst conditions.

Expandability

With many camera systems, realizing later that you need to add a side or in-cab camera to assist in lane changing or monitoring driver behavior can be a huge problem. Your system may not be capable of adding the additional channels needed to support these changes. The camera system you choose should allow you to add additional cameras or audio channels in a plug-and-play fashion at any time. By ensuring that your system has extra channels available at the initial purchase, you can expand quickly and efficiently minimize the amount of downtime and expense as you retrofit your fleet vehicles to ensure the most comprehensive coverage possible.



View from a camera on an early morning run.

Recording

Expandability can be more than just adding cameras and audio. When looking to purchase your system, take into account any future needs of your company. By deciding to incorporate a solid state digital video recorder (DVR)

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Choosing the Right Backup Camera System

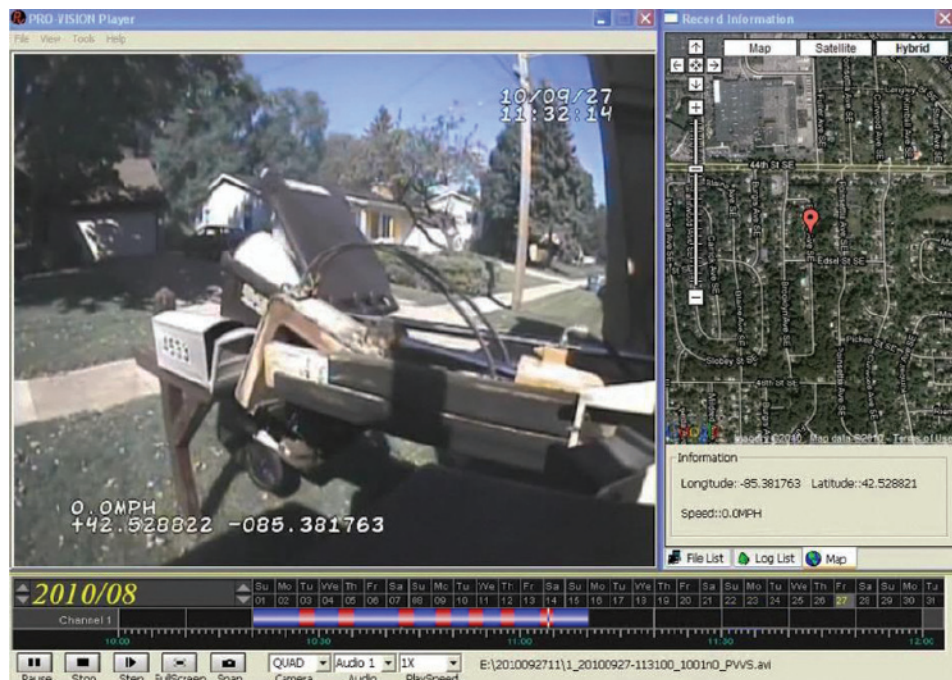
with continuous recording into your backup system, you can actually increase your revenue streams for minimal additional expense as well as provide a great return on your investment. DVRs can be used to audit route activity, protect against false customer claims, reduce corporate liability and customer complaints, and provide evidence in case of an accident. Choosing a solid state system means there are no moving parts to break like a hard drive, so you won't have the downtime and additional expense while you're waiting to get your trucks up and running again. In addition, a large number of insurance companies are now decreasing premium rates for companies that have continuous recording systems running on their vehicles. As a result, the system ends up paying for itself in no time at all.

Warranty

This is great when coupled with a strong warranty program that shows the manufacturers confidence in their product. Selecting a system that has a warranty of several years, and that is not full of conditions and fine print should be part of your checklist. Five years is not uncommon, but not every manufacturer stands behind their product for that length of time, and when they do, most of the time the systems have additional requirements that have to be met to prevent voiding the warranty. A company that is truly out to service the customer and takes pride in their product is certainly one worth doing business with.

Affordability

While camera systems that are built as aftermarket products for SUVs and RVs can be purchased for a rather low cost, camera systems that are rated for commercial use usually run a little higher in price. The starting price for a quality commercial camera system is usually in the range of \$300 to \$500. Anything you find for less on various discount websites should be put under



Mailbox damage recorded.

scrutiny as it may not meet the demands that you are going to make of it. This will, in the end, cost you more money for a less superior product.

Be Sure to Do Your Research

Check out sample videos on company Web sites to be sure you know what you are getting. After all, if they don't have samples of what their product can do, how do you know it's going to work for you? Make sure the products that are offered will be durable enough to take a beating as you run your routes, and the connections are secure and watertight to prevent the interference that so many wireless systems encounter. Select a system that has a camera and mounting solution for every type of vehicle in your fleet, and be sure that they are rated for all weather and climate conditions. Plan for the future by ensuring the system you select can expand with your needs as well as offer you future revenue streams. And finally check out that warranty. Make sure that you

understand what you're getting, and you can feel confident in the product you choose. By doing your homework, setting high standards and keeping the future in mind, you will end up with a backup camera system that is rugged, reliable, and able to grow with your business. | **WA**

Matt Van Kirk is the marketing manager at PRO-VISION Video Systems, a Byron Center, MI-based company, named as one of the fastest-growing private companies in America by Inc. Magazine. PRO-VISION has grown to be a global leader in engineering, manufacturing, supplying and installing commercial video systems for a diverse group of industries. Founded by veterans of the waste industry, PRO-VISION is a pioneer in waste vehicle video recording systems. For more information, call (800) 576-1126 or visit www.seeingissafety.com.

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Using Rail to Transport Waste— Quantifying the Economics

Darell Luther

Understanding your transportation options and realizing cost savings are paramount. Once you've put the puzzle pieces together, you may be surprised at THE COST SAVINGS WASTE-BY-RAIL WILL HELP YOU REALIZE.

USING RAIL AS AN OPTION TO TRANSPORT WASTE

seems foreign to many local collection and disposal companies. The concept of railing out waste is particularly odd for municipal solid waste (MSW) or construction and demolition debris (C&D) material that is collected for a municipality and disposed of at a local landfill. Why would a company look beyond a local option when the local landfill is readily available and convenient? The answer to this question is best answered by the one resounding question we consistently receive, “at what point do the economics favor transporting waste (MSW and C&D) by rail?”

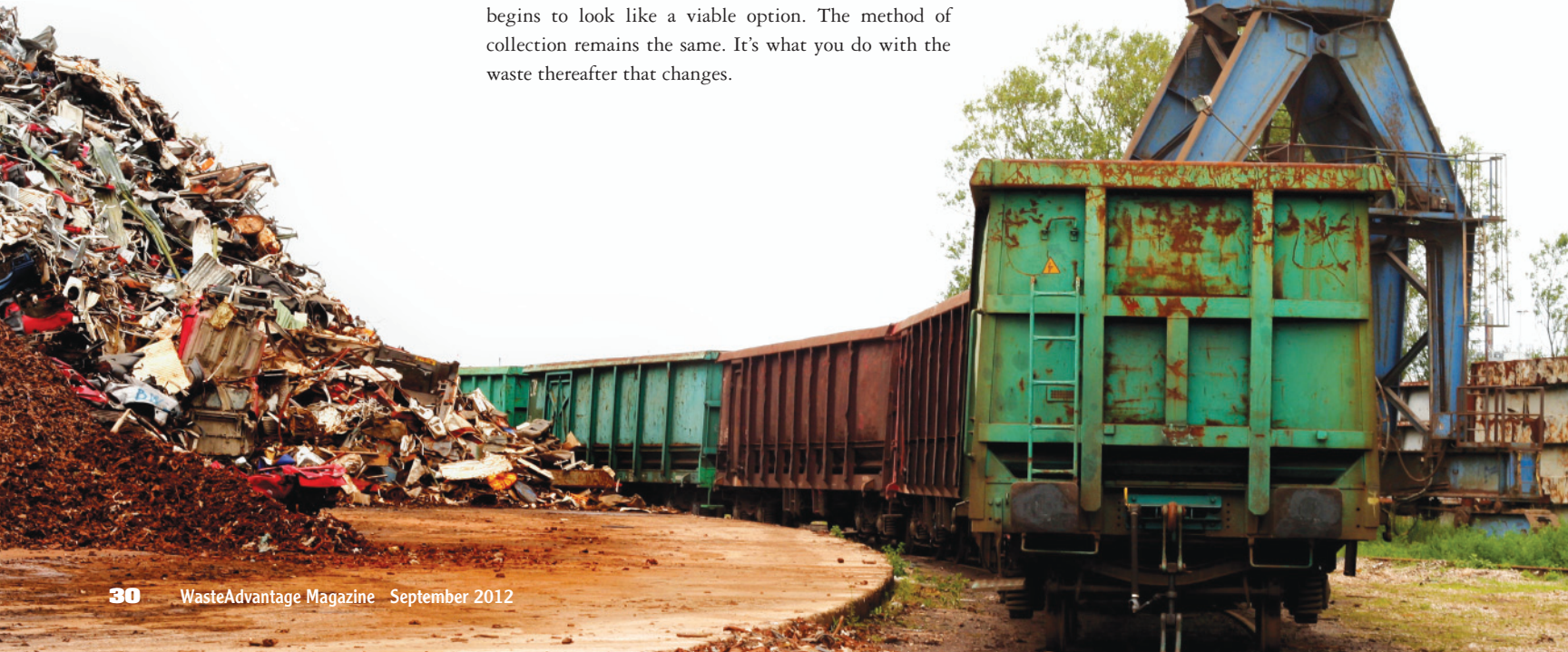
This is a multi-faceted question that needs to be broken down into its component parts to fully understand the parts and to quantify and qualify the answer. Somewhere between collection and disposal lie the factors that determine the economics.

The Big Picture

The big picture of waste disposal simply consists of pricing your waste disposal options at various disposal sites and then determining the logistics of transporting waste-by-rail from your site to a selected disposal site or sites. If pricing remains economical, waste-by-rail begins to look like a viable option. The method of collection remains the same. It's what you do with the waste thereafter that changes.

After collection, you have a choice of handling and transport options. You can either process (bale, separate, segregate or compress) or leave the material in bulk form as collected. The method of handling (process or bulk) after collection then determines your selections available for rail transportation options.

If you process your waste in a form that allows it to be easily handled, e.g. baled, you have the option of another truck transport to a rail trans-load site. If waste is not processed, it is generally transported directly to a rail trans-load site directly from collection. Either way, it's just a matter of economics and access to land for processing and transfer to a railroad site that has the capability to trans-load the waste.





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During the discovery phase of waste processing, bulk handling and transfer options, you'll also want to be working on the rail portion of the movement. Locate a rail site that is suitable for your requirements and that offers competitive rail rates to the chosen disposal site or sites.

Much like a semi-complex jigsaw puzzle, you'll find that by putting together separate sections of the puzzle and then bringing those sections together, you'll find a solution that yields the best overall economic results.

Putting Together the Origin Site Puzzle

Start geographically in your local area to determine where you can obtain rail access. What you are looking for is a place to either trans-load processed or bulk waste or a yard where you can set up a processing facility that has direct rail access. The ability to transfer processed or bulk material direct from collection is often a better economic solution as it entails one less step in the logistics process. However, don't rule out processing your material at a yard off-rail and using a trans-load facility to access rail. It is even better if you can access two competing rail lines, since as dual access to rail often yields better pricing. The best place to start looking for a physical rail site is with the industrial development group at the railroad. Each Class I railroad has such a department as do many smaller railroads. U.S. Class I railroad industrial development contacts can be researched via their Class I Web site at www.bnsf.com, www.uprr.com, www.nscorp.com, www.csx.com, www.kcsi.com, www.cn.ca and www.cpr.ca. Oftentimes, railroads will only be able to assist in a limited fashion

due to their restricted resources and lack of in-depth knowledge of the local area. Don't despair. If you aren't having any success with the railroad, the next call should be to a local Chamber of Commerce, real estate office, county commissioner or industrial development group for your area. Many times local planning and zoning departments also have advanced information on potential processing and transfer sites.

Putting Together the Rail Puzzle

Somewhat consecutive with finding a processing and transfer site, you will also want to start the rail requirements research. This primarily consists of determining the rail rate, what type and quantity of railcars will be required, planning the primary route of shipment over which rail line(s) and deciding on where exactly you are going to ship your product to (location or track specific) at the destination. With this information in hand, you can determine the price of shipping waste by rail.

The most logical place to start is to first obtain rail rates so that you have the knowledge of any pricing options before finalizing an origin site plan. For instance, if you obtain rates for processed and bulk waste, you will have an initial idea of pricing to plug back into the total cost model to determine which option is most economical and/or least restrictive in bringing to fruition.

The best way to obtain indicative rates is to look at the individual Web sites for the rail route your shipments will travel over. Most railroads publish public tariffs that will give you an idea of cost between processed and bulk commodities

Using Rail to Transport Waste—Quantifying the Economics

as well as the rules and regulations for shipment of waste commodities. Rail pricing is by Standard Transportation Commodity Code (STCC) and the five-digit STCC for garbage waste is 40291. Other STCC can also be researched on the railroad Web sites. You'll need STCC information to obtain pricing. If a railroad doesn't present an online pricing option you can call a marketing or sales representative. Depending on the railroad, they are either located in emerging markets or industrial development groups.

After obtaining the rail rate(s) be sure to read the rules and regulations that apply to your shipments. Pay particular attention to private versus railroad car requirements and rates as you'll generally notice a significant cost differential, fuel surcharge and switching fees, open top loading rules such as railcar covering or tarp requirements, railcar sealant and odor control (if applicable), environmental requirements and railcar storage, demurrage and OTS requirements.

Putting Together the Destination Puzzle

Oftentimes, the destination puzzle is easier to construct than the other major parts of the puzzle. If you're researching a destination landfill or a C&D site, it's generally because the tipping fee is significantly less than a local option. If the site is on rail, it's just a matter of coordination of the rail shipments to the landfill. If the site is off rail, you can use the same process used in finding an origin site and one additional resource, the landfill operator. Generally, they want your business and will assist with finding a rail trans-load site.

Tipping Fees Drive Rail Option

Tipping fee costs are what drive the longer haul rail option. Consider that the higher priced tipping fees are in major population centers primarily along the east coast and in Washington State. There are also bubbles of higher tipping fee costs in areas that only have a public (municipal) landfill option that use tipping fees to offset other program costs such as recycling, etc. Albeit not an exact science, MSW tipping fees generally range from \$0-\$25/ton, \$26-\$50/ton, and \$51/ton and over range. If you're in the higher range, you will probably want to explore your rail waste transport options.

In an industry where every dollar counts and transportation is one of the largest cost factors, understanding your transportation options and realizing cost savings are paramount. Once you've put the puzzle pieces together, you may be surprised at the cost savings waste-by-rail will help you realize. | **WA**

Darell Luthber is President of Forsyth, MT-based Tealinc Ltd., a rail transportation solutions and railcar leasing company. Darell's career includes positions as President of DTE Rail and DTE Transportation Services Inc., Fieldston Transportation Services LLC, Managing Director of coal and unit trains for Southern Pacific Railroad, and directors positions in marketing, fleet management and integrated network management at Burlington Northern Railroad. Darell has more than 24 years of rail, truck, barge and vessel transportation experience concentrated in bulk commodity and containerized shipments. He can be reached at (406) 347-5237, via e-mail at darell@tealinc.com or visit www.tealinc.com.

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Zero Accident Culture



ROI = ROI

John Wayhart

HOW TO MAKE
YOUR RETURN ON
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equal your reach of
influence (ROI).

AS YOU MAY RECALL IN THE JUNE ISSUE OF WASTE

Advantage Magazine, I spoke about mid-term reviews of your safety program and mentioned the simple phrase ROI = ROI. You may have scratched your head wondering where that equation came from and what it even means. For years, one of the areas of greatest concern for employers in regards to safety is that it's been difficult to articulate what exactly is a reasonable return on investment when it comes to an organization's safety program.

In fact, when economic times are tough one of the first layoffs that companies make are to the safety personnel. That decision usually accompanies reduced budgeting for safety programs, initiatives and safeguards. Sadly, some waste and recycling owners feel that as long as the company is in OSHA, DOT and MSHA compliance, there is no need for a robust safety program that promotes a Zero Accident Culture.

Changing the Acronym for ROI

Another area of concern for waste and recycling companies is the major highs and lows or lack of energy that is necessary to advance and continuously

improve upon safety performance. When there is a lull in incidents, which should be a positive, workers tend to become more relaxed and not as invested in continually promoting and improving upon safety training, measures and exposures. In turn, managers tend to feel less compelled to continually remind and train even seasoned employees on proper safety precautions.

What I have found in companies that feature safety excellence as a core competency of their business is that everyone has been assigned (whether self-assigned or through a manager) a degree of responsibility in the area of safety, risk management, exposure reduction and professionally confronting safety concerns immediately. These companies have what I call a very high ROI or "reach of influence". Reach of influence describes in many ways the culture of your company and its organizational strength. It is what your management team and employees do when left to their own devices. Furthermore, it defines the work ethic and operational results you would expect in a well-run organization.

MY WASTE HAULING/EQUIPMENT/SERVICES COMPANY

ROI = ROI	20%	40%	60%	80%	100%
Reach of influence					
Owner/President					
Chief Financial Officer					
VP Operations					
Human Resources					
Foreman/Supervisor					
OSHA/DOT/Fire/Police/Ins. Representative					

Chart 1: Based on the description for each influencer, rate how effectively that individual is being used and/or promoting Zero Accident Culture for safety.
Chart courtesy of John Wayhart.

So how do you get started on building ROI = ROI within your waste company?

The Right Equation

The best place to start is by examining your current state for safety performance. No matter the size of your workforce, the goal is to reach 100 percent of all employees in terms of safety expectations on a daily basis. Achieving this goal can be difficult as it requires the discipline from the top down, to perform a job the correct and expected way with favorable outcomes. However, reaching this goal provides clarity, efficiency and continuous improvements in your operations. Safety should be addressed as an integral part of workplace excellence, revenue growth and customer brand. In other words, safety isn't separate from business; it's a significant part of its success.

Does 100 percent of your company believe they have the support and guidance when it comes to workplace safety?

Figuring Your ROI

The ROI = ROI observation is easy to calculate when using Chart 1. Based on the description for each influencer, rate how effectively that individual is being used and/or promoting Zero Accident Culture for safety. The higher your overall reach of influence is the greater your return on investment (i.e. insurance premium and workers' compensation reductions, lower cost of risk, greater operational efficiency and reduced business interruption) will be:

- *Owner/President*—Ownership and/or Senior Executive fully support and have signed off on a corporate safety mission statement. This is used as a backdrop in production, operational and safety meetings, as well as in the hiring process and new employee orientation. The owner is keenly aware of workplace safety initiatives and makes it a part of their daily interaction to reinforce positive, safe practices, such as glasses, seat belts, reflective clothing, steel-toed shoes, etc.

- *Chief Financial Officer (CFO)*—The CFO fully discloses the Experience Modification Rating and operational costs of workplace injury, as well as communicates the progress being made in terms of reducing the frequency and severity of incidents. The CFO discusses with the executive team and/or owner the available budget for workplace excellence incentives and celebrations.

- *VP Operations*—This person is the field executive responsible for carrying forth the safety and workplace excellence message daily to all of the operations. He

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ROI = ROI

or she sets the tone by ensuring employees follow through on compliance of workplace hazards, therefore, avoiding or eliminating loss exposure.

- **Human Resources (HR)**—HR acts as the administrative executive by hiring safety conscious individuals and preparing them for the job. Selection, training and evaluation come through this company function.
- **Foreman/Supervisor**—This person or group is the daily reinforcement for safe practices and emphasizing each employee's responsibility to themselves, their family and the organization. They are thoroughly involved with their workers' individual performance and attention to safety.
- **OSHA/DOT/Fire/Police/Insurance Representative**—What is the degree to which your company uses tax payer services or insurance representatives that are part of your overall insurance premiums? Tremendous value and return on investment is embedded in everyone's business by these outside resources.

Celebrate Good Times

Come on! Although the song is notorious with weddings, the motto is still applicable to the workplace. The influencers, while constantly reminding employees about a safe culture, should also celebrate success and recognize safety roles models among employees. Positive reinforcement builds the idea of role models for employee behavior. Senior level employees need to bring energy to their jobs and the people that they "touch." When recognition becomes absent, your organization can fall into a lull of complacency that merits more frequent incidents.

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The Big Picture

ROI = ROI is a significant picture of an organization and how prepared, ready and experienced they are as it relates to workplace excellence. Strategically examining the influencers in your company can be rewarding for both your employees and organization in terms of return on investment. | **WA**

John Wayhart is a Senior Vice President at Assurance Agency (Schaumburg, IL). With more than 29 years in the insurance and risk management industry, his expertise lies in providing solutions for a wide range of businesses including the waste and recycling industry. In 1989, John trademarked Zero Accident Culture® and continues to teach, coach and mentor this process to help drive down the cost of risk to improve operational effectiveness and financial results. John can be reached at (847) 463-7161 or jwayhart@assuranceagency.com.

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Continuously Improve Safety Culture to Impact Bottom Line Results: A Case Study of Snohomish PUD

Todd Efird, CSP

The continuous improvement process is a never-ending journey of employees getting actively involved in building the kind of safety system that they believe will work. SNOHOMISH PUD IS MOVING FROM A CULTURE OF “US AND THEM,” IN WHICH UNION EMPLOYEES AND MANAGEMENT WERE PERPETUALLY AT ODDS, to a culture of working together as “us” toward a common goal of zero-incident performance.

WHY IS IT IMPORTANT TO FOCUS ON SAFETY CULTURE

improvement rather than safety programs? What's the difference? There are many debatable definitions of culture. For the purposes of this article and case study, we will simplify it in this way: culture is the way people behave in their work environment when nobody is looking. Culture is based on the norms that are accepted as part of “the way we do things around here.” Let's face it—most accidents happen when the safety person, or someone else from the management team, is not around. Managers and safety professionals cannot be everywhere, watching every employee's behavior all the time. So what is the most effective approach to influencing your company's culture?

Snohomish County

According to Snohomish County's (Everett, WA) Public Utility Executive Chris Heimgartner, it's about understanding the key components to a strong safety culture, then taking a strategic approach to improving these key areas. In 2009, Heimgartner began to evaluate the safety culture and corresponding safety results within the utility. He was dissatisfied with the rate by which employees were being injured and set on a path to implement a culture shift within the organization. He established a team of employees to begin a search for a consulting partner to assist in the journey. The team soon narrowed the search to two companies specializing in

Snohomish PUD Category	Percent Positive			Percent Gap		
	Emp.	Sup.	Mgr.	Emp/Sup.	Emp./Mgr.	Sup./Mgr.
Recognition for Performance	44.1	52.4	50.0	18.7	13.4	4.5
Discipline	60.6	47.7	67.4	21.3	11.3	41.3
Inspections	65.4	82.2	64.4	25.6	1.5	21.6
Supervisor Training	65.8	80.0	58.1	21.5	11.7	27.3
Goals of Safety Performance	66.3	72.7	46.5	9.7	29.9	36.1
Involvement of Employees	68.3	76.6	74.4	12.1	8.9	2.7
Quality of Supervisions	69.8	87.2	72.7	24.9	4.2	16.6
Substance Abuse	69.8	75.2	67.9	7.7	2.7	9.7
Awareness Programs	72.5	80.4	73.9	11.0	1.9	8.2
Operating Procedures	72.9	77.3	75.8	6.1	4.0	2.0
New Employees	74.3	85.2	72.2	14.7	2.8	15.3
Safety Climate	74.5	82.6	82.4	10.9	10.7	0.2
Stress	74.6	81.1	90.1	8.6	20.7	11.1
Employee Training	76.1	89.1	82.9	17.2	9.0	7.0
Communication	76.3	87.8	81.4	15.1	6.8	7.2
Attitude Towards Safety	76.4	86.5	83.5	13.3	9.4	3.4
Support for Safety	77.0	84.8	76.0	10.1	1.3	10.4
Hazard Correction	80.2	88.0	93.8	9.7	16.9	6.6
Management Credibility	80.5	94.0	87.8	16.8	9.0	6.7
Safety Contacts	82.0	92.7	81.3	13.1	0.9	12.3
Incident Analysis	82.2	92.5	75.8	12.6	7.8	18.1
Combined Score	71.9	80.8	74.2	14.3	8.8	12.8
Respondents	398	23	11			

Figure 1

The Safety Perception Survey establishes a baseline measurement of employee attitudes and perceptions across 20 statistically validated safety culture indicators. Large perceptions gaps between employee groups indicate the need for culture improvement. Figure courtesy of Caterpillar Safety Services.

Needs immediate attention	Under 60%
Needs improvement	60% to 69%
Strong performance	70% to 84%
World class	Over 84%
Needs attention	14% perception gap

Baseline/Ongoing - Safety Meeting Survey Questions

1. Was the safety meeting fun?
2. Are you satisfied with the quality of the safety meeting?
3. Were positive safety recognitions given at the meeting?
4. Do you think current safety issues are being resolved/addressed in a timely manner?
5. What would make our safety meetings better?

Figure 2: Courtesy of Snohomish County.

Category	Snohomish PUD		Global Database Average All Hourly Takers	Point Change 2010 to 2011	Percent Change 2010 to 2011
	2010	2011			
Recognition for Performance	44.1	58.2	59.3	14.1	32.0%
Discipline	60.6	65.5	69.9	4.9	8.1%
Inspections	65.4	72.6	67.7	7.2	11.0%
Supervisor Training	65.8	70.4	69.0	4.6	7.0%
Goals of Safety Performance	66.3	73.1	76.4	6.7	10.3%
Involvement of Employees	68.3	73.4	72.1	5.1	7.5%
Quality of Supervisions	69.8	76.8	72.7	7.0	10.0%
Substance Abuse	69.8	72.3	69.0	2.5	3.6%
Awareness Programs	72.5	73.7	71.7	1.2	1.7%
Operating Procedures	72.9	72.5	71.5	-0.4	-0.5%
New Employees	74.3	77.0	77.1	2.7	3.6%
Safety Climate	74.5	79.0	74.9	4.5	6.0%
Stress	74.6	76.2	66.4	1.6	2.1%
Employee Training	76.1	80.2	76.6	4.1	5.4%
Communication	76.3	77.5	78.6	1.2	1.6%
Attitude Towards Safety	76.4	78.5	75.4	2.1	2.7%
Support for Safety	77.0	80.0	75.0	3.0	3.9%
Hazard Correction	80.2	82.0	77.2	1.8	2.2%
Management Credibility	80.5	82.6	76.4	2.1	2.6%
Safety Contacts	82.0	84.9	80.4	2.9	3.5%
Incident Analysis	82.2	85.0	81.7	2.8	3.4%
Average Score	71.9	75.8	73.2	3.9	5.4%
# of Respondents	398	357			

Figure 3

Snohomish took a second Safety Perception Survey about two years after its initial assessment. Results showed a marked improvement in the area of positive recognition. Figure courtesy of Caterpillar Safety Services.

safety culture improvement and, ultimately, selected Caterpillar Safety Services (formerly Core Media) (Peoria, IL).

First Steps

The first step in the journey was to establish and train a Safety Steering Team, consisting of both management and bargaining unit employees, to make decisions about the right approach for the utility. The team was trained by Caterpillar Safety Services in the following two key culture improvement concepts and their role in the overall improvement process¹:

6 Criteria for Excellence

- Senior management VISIBLY committed
- Middle management ACTIVELY involved
- Supervisors focused on QUALITY activities
- Employees ACTIVELY involved
- Flexibility to meet site culture
- Positive perception among employees

4 Accountability Steps

- Clearly defined activities
- Training at all levels
- Measurement systems
- Recognition for performance

Safety Perception Survey

Next, the team decided to conduct a Safety Perception Survey (SPS) to identify strengths and weaknesses in the organization's safety culture, and to identify any gaps in perceptions between employees, supervisors and managers (Figure 1, page 37). The SPS takes the guesswork out of safety culture assessment. Developed by safety guru, Dr. Dan Petersen and tested over a 20-year period, the survey is the only statistically validated measurement tool on the market. The 99 yes-no questions included in the survey map back to 21 key safety culture categories, which are scored by a percent-positive response. Every individual in the organization, from the CEO to hourly employees, is administered the same survey questions. The responses are categorized by job function into three groups—hourly employees, supervisors, managers—in order to reveal perception gaps between those groups that could be hampering strong performance. The SPS can be administered and scored within a six to eight week period, after which the survey results can be used by a steering committee to provide direction to a continuous improvement team (CI Team).

Continuous Improvement Teams

The Snohomish team developed a communication plan for sharing the results with employees and a strategic plan to use the data for continuous improvement efforts. The survey results revealed the lowest scoring category was recognition for performance. In other words, employees believed attention to safety issues was almost always focused on the negative, rather than on noticing and recognizing positive action. Based on this feedback, the steering committee asked CI Teams, which were comprised of employee volunteers at the hourly and supervisor levels, to develop strategies for incorporating positive recognition into the Snohomish culture. Ideally, each CI Team should focus on one, manageable area of an organization's day-to-day activities in which improved protocol could enhance overall safety culture.

One CI Team designated safety meetings as an area for improvement that would touch on several key factors influencing safety culture, including recognition. The group spent about one week identifying existing barriers to safety excellence and developing solutions for improvement. Their purpose, outlined on day one, was to create a more productive safety meeting process by defining roles, encouraging active participation and promoting a positive and safe work environment. Ultimately, their chosen processes met the six criteria for excellence and four steps to accountability. In every organization pursuing safety culture excellence, employee ownership of the drive for continuous improvement starts with the CI Team, then permeates the organization through the successful execution of its plan.

Pilot Project

Once its plan was set, the CI Team selected groups within the organization

to pilot the new ideas. The key to success at this juncture of the process was choosing pilot groups that would embrace the opportunity for improvement and see rapid success from its efforts. Pilot groups were designated in three areas of the utility: transportation, meter and electrical line crews. The process began with the CI Team surveying the pilot groups about the current safety meeting procedures and outcomes, which provided a baseline for improvement (see Figure 2).

The CI Team then trained the pilot members to implement strategies for improvement. Regular communication between the CI and pilot teams provided the key measurement of the pilot's success. Regular survey results and simple dialog between employees about which components of the plan were working, and which areas needed modification, helped the CI Team craft a stronger strategy for implementation utility-wide. After the necessary modifications were made, the plan was rolled out to the entire organization by the employees who built it—the essence of active employee involvement in building and owning new safety processes.

About two years after completing its first Safety Perception Survey and running three CI Teams, Snohomish followed up with another round of the SPS. The results demonstrated marked improvement, particularly in the area of recognition, where a 32 percent increase in positive responses was recorded (see Figure 3).

The Results

The continuous improvement process is a never-ending journey of employees getting actively involved in building the kind of safety system that they believe will work. Snohomish PUD is moving from a culture of “us and them,” in which union employees and management were perpetually at odds, to a culture of working together as “us” toward a common goal of zero-incident performance.

| WA

Todd Efird is a Certified Safety Professional with more than 22 years of safety management experience. As a Senior Safety Consultant with Caterpillar Safety Services, Todd leverages his expertise in leadership and accountability training to help organizations in a variety of industries achieve zero-incident performance. For more information about other utility companies, construction companies, underground mining, health care and heavy manufacturing companies who have embarked on this culture improvement journey, contact Caterpillar Safety Services at SafetyServices@cat.com.

Note

1. The 6 Criteria for Excellence and the 4 Steps to Accountability were outlined by Dr. Dan Petersen. Petersen, Dan. “Human Error Reduction and Safety Management”, Third edition, copyright 1996, Van Nostrand Reinhold.

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Breakthroughs and Innovations



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FOR MORE INFORMATION, CONTACT SARAH AUBREY, CERTIFIED GRANT ADMINISTRATOR, AT (317) 996-2777, VIA E-MAIL AT SARAH@PROSPERITYAGENERGY.COM OR VISIT WWW.PROSPERITYAGENERGY.COM.



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Recycling

Slippery Regulations Atop Steep Markets

Matthew R. Walsh

MORE OFTEN THAN NOT, RECYCLERS ARE THE LAST TO KNOW ABOUT changing laws and regulations. For some, the news comes too late without an opportunity to protect against the onslaught of legal threats, fines or even jail time. Legislators seem to have a zero-tolerance attitude towards scrap theft, and for good reason, but it may appear to some that their crosshairs are pointed away from the wrong-doers and instead directly at recyclers.

Rebirthing Entrepreneurs

With the economy falling further into the abyss, ordinary people who used to visit local scrap yards for a supplemental income are rebirthing themselves

into entrepreneurs by opening recycling facilities of their own. Unfortunately, with new facilities being born every day, the supply of scrap metal is surpassing the demand and driving market prices into the ground.

Recyclers who have been family-owned businesses for 50+ years are being forced to find a way to adapt to the times by involving themselves in markets which are unfamiliar to them. Some businesses have begun selling raw materials from construction and demolition sites, others are doing scrap metal pickups in vehicles and some are even turning to the Internet to make a profit by buying catalytic converters and precious metals online through auction sites and classified ads. One thing is for certain, the game has definitely changed.



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Compliance LAWS

Recyclers can use sites such as ISRI.org and ScrapLaws.com to find out what laws they must follow in order to stay compliant.

Scrap Metal Theft

Amidst the plethora of recycling centers, an almost endless field of industrial machinery moving millions of metric tons per month of metal, darkness looms. The darkness, of course, is increasing restrictions on recyclers. As many as one-third of all new recycling centers will involuntarily close within a year of opening due to one simple fact: Metal recycling is at an all-time high. It has become a primary income for some, and a required supplemental income for others. With our nation's economy slumping, desperation forces thieves to turn to scrap

metal theft, pushing it to a record high. Northern Cincinnati, OH alone saw a 162 percent increase between 2006 and 2007 in copper theft; these numbers have continued to grow throughout the years and are continuing now into 2012.

Today, copper prices are between \$3.00 and \$3.70 per pound, compared to \$0.60 per pound in 2002. Because of this, there were a total of 25,083 claims identified for the theft of copper, bronze, brass and aluminum submitted between January 1, 2009 and December 31, 2011 (according to the National Insurance Crime Bureau). From all 25,000, 96.1 percent of those involved copper. Fifty-five percent of those claims were on commercial policies and 45 percent involved personal policies.

It is for this reason that law enforcement officials are stepping up to combat this serious issue. The U.S. Department of Energy estimates that scrap metal theft costs businesses around \$1 billion per year. Unfortunately, the penalties for scrap metal thieves are not increasing, the penalties for non-compliance against recyclers are.

Legislators, it seems, have one simple thought process on how to combat this issue: "If thieves don't have anywhere to take the metal, they won't steal it." To most, that statement would seem to make logical sense; however, the number of recycling centers is increasing daily. Instead of limiting the number of facilities that can open, the States choose to allow the industry to grow. As scrap metal facilities increase in numbers, the prices of scrap metal will fall. This, in turn, will likely cause theft to rise because the value of the metal will be less, increasing the need for more to be stolen to make the same amount of money.

Forcing Compliance

Legislators simply don't understand how to deal with the growing problem. They are imposing nearly impossible-to-follow regulations on recyclers to force compliance. In some states, such as Florida and Georgia, offenses can now mean the owner or operator of a facility be prosecuted with felony charges for non-compliance. Advanced computer systems exist to keep recyclers in line, but legislators continue changing the laws in a futile attempt to seemingly "trip-up" recyclers.

Most states already require capturing pictures of materials and a picture of the seller (aka "customer"), as well as their driver's license, fingerprint, signature and vehicle information. However, some States have gone above and beyond what would normally be expected. Georgia law for instance now requires that a recycler inspect a customer's vehicle for passengers and obtain drivers license and identification information from everyone whether they are involved in a scrap metal transaction or just along for the ride. Florida law requires all daily transactions be electronically uploaded to an international audit company's system for review and cataloging. The federal government requires all salvage

vehicles to be reported to the National Motor Vehicle Title Information System. Several States have their own local reporting systems in addition to the others mentioned earlier, including Texas Department of Public Safety. New York requires a handwritten form for every motor vehicle recycled in the state to be mailed to the Department of Motor Vehicles within three days.

With regulations like this, it is no wonder why would-be entrepreneurs get in and out of the business within a year. Some of them unscathed, but some with permanent criminal records or stuck in perpetual financial turmoil over the potential of fines in the hundreds of thousands of dollars possible within only a year of operation.



A mobile metal recycler uses the Nexus recycling software to stay fully compliant in Florida during off-site pickups. Photo courtesy of AEON Blue Software.

Implementing a Unified Reporting System

The problem, as simple as it is, is also a complex one. How do you stop criminals without punishing legitimate business owners who are in some cases just as responsible as the thieves they are enabling? One national, unified reporting system for all States that connects law enforcement everywhere would be a good start, but until legislators stop trying to deal with a national problem on a localized level, recyclers may continue to feel the wrath for some years to come. | **WA**

Matthew R. Walsh is President and Lead Software Developer for AEON Blue Software & Development (Tampa, FL). He is an expert computer specialist and programmer who has developed enterprise-level software for GM, Ford, Chrysler, BMW, Lamborghini/Audi and Mercedes-Benz. Aeon Blue Software is the developer of the Nexus software package for recyclers. Matthew can be reached at (813) 333-1112 or visit www.NexusRecycle.com.

Landfills

Landfill Fires



LANDFILL FIRES FALL INTO ONE OF TWO CATEGORIES, SURFACE AND underground fires. Depending on the type of landfill and type of fire, landfill fires can pose unique challenges to the landfill/waste management industry and the fire service.

Surface Fires

Surface fires involve recently buried or uncompacted refuse, situated on or close to the landfill surface in the aerobic decomposition layer, generally 1 to 4 feet in depth. These fires can be intensified by landfill gas (methane), which may cause the fire to spread throughout the landfill. Surface fires generally burn at relatively low temperatures and are characterized by the emission of dense white smoke and the products of incomplete combustion. The smoke includes irritating agents, such as organic acids and other compounds. When surface fires burn materials such as tires or plastics, the temperature in the burning zone can be quite high. Higher temperature fires can cause the breakdown of volatile compounds, which emit dense black smoke. Surface fires are classified as either accidental or deliberate. Surface fires include the following:

- *Dumping of undetected smoldering materials into the landfill.* Hot load fires are caused by the disposal of refuse that is still burning on arrival to the landfill (e.g., cleared brush).
- *Fires associated with landfill gas control or venting systems.* Landfill gas control systems can themselves pose a fire hazard. Landfill gas (predominantly methane) can be ignited as it escapes from the vents or from leaks in the collection pipe network. Excessive gas extraction can also be a fire cause. The vacuum created by excessive extraction can increase the airflow and thereby increase the oxygen level in the landfill, which can cause underground fires.
- *Fires caused by human error on the part of the landfill operators or users.* Landfill operators and users can cause fires through careless smoking on the landfill, which can ignite waste or landfill gas. Also, as some hazardous substances can ignite when mixed, operators must take care to prevent the dumping of reactive materials into the landfill.
- *Fires caused by construction or maintenance work.* Fires can occur while construction and maintenance takes place, including fires caused by sparks from vehicles used in the landfill (dump trucks, bulldozers, backhoes, etc.). A surface fire could also be ignited when drilling or while driving metal pipes through layers of buried waste if a hard object buried in the landfill is struck. Usage of welding or electrical equipment onsite poses a fire hazard, due especially to the increased presence of methane gas.
- *Spontaneous combustion of materials in the landfill.* The mixing of certain materials in a landfill can result in spontaneous combustion. Even in small quantities, some chemicals can ignite if exposed to one another. Also, some materials, such as oily rags, can spontaneously combust under certain conditions. Spontaneous combustion can also result from bacterial decomposition.

- *Deliberate fires, which are used by the landfill operator to reduce the volume of waste.* Landfills contain refuse such as dry garden waste, grass, leaves and branches. Sometimes these materials are deliberately set on fire to reduce refuse volumes, reduce operating costs and increase a landfill's operating life. This is an accepted practice under strictly controlled conditions. Uncontrolled, these deliberate fires could escalate into larger fires, cause explosions, or create hazardous products from the ash and residue burned.
- *Deliberate arson fires, which are set with malicious intent.* Arson is a serious problem in the U.S.; therefore, it is not surprising that landfills are targets for malicious fires.

Underground Fires

Underground fires in landfills occur deep below the landfill surface and involve materials that are months or years old. These fires are generally more difficult to extinguish than surface fires. Underground fires also have the



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potential to create large voids in the landfill, which can cause cave-ins of the landfill surface. Further, they produce flammable and toxic gases (such as carbon monoxide) and can damage leachate containment liners and landfill gas collection systems.

The most common cause of underground landfill fires is an increase in the oxygen content of the landfill, which increases bacterial activity and raises temperatures (aerobic decomposition). These so-called “hot spots” can come into contact with pockets of methane gas and result in a fire. Of particular concern with these long-smoldering, underground fires is the fact they tend to smolder for weeks to months at a time. This can cause a buildup of the byproducts of combustion in confined areas such as landfill site buildings or surrounding homes, which adds an additional health hazard.

Underground fires are often only detected by smoke emanating from some part of the landfill site or by the presence of carbon monoxide (CO) in landfill gas. In the event of an underground fire, CO may be present at toxic levels near the landfill’s surface. Generally an underground fire can be confirmed by:

- Substantial settlement over a short period of time
- Smoke or smoldering odor emanating from the gas extraction system or landfill
- Elevated levels of CO in excess of 1,000 parts per million (ppm)
- Combustion residue in extraction wells or headers
- Increase in gas temperature in the extraction system (above 140°F)
- Temperatures in excess of 170°F

To confirm a subsurface fire using CO, the results must be acquired through quantitative laboratory analysis (using portable monitors may result in artificially high concentrations). Levels of CO between 100 and 1,000 ppm are viewed as suspicious and require further air and temperature monitoring. Levels between 10 and 100 ppm may be an indication of a fire but active combustion is not present.

Extinguishing Landfill Fires

It is important to note that the different dynamics, characteristics, and regulations of landfills and the fires that occur in them suggest that tactics need to be determined on a case-by-case basis depending on the materials buried, which materials have ignited, depth of the fire and the fire’s ignition source.

Wind/Weather

Wind and inclement weather can increase the health hazards for firefighters operating on the fireground (e.g., in extremely hot or cold weather) and can directly affect fire spread.

Water Supply

The use of water to suppress landfill fires is controversial. The application of large volumes of water may actually exacerbate a fire by contributing to the process of aerobic decomposition. Further, adding water to the landfill creates additional leachate, which may overwhelm the leachate collection system in the landfill (if one exists). If the collection system is overwhelmed, the additional leachate could contaminate ground and surface waters surrounding the landfill. Depending on the landfill’s location, there might not be an adequate supply of water available for fire suppression. Firefighters may have to establish a water supply using tankers and nearby static water sources (e.g., lakes, reservoirs).

Foam is an important consideration in landfill fire suppression. There are two primary types of firefighting foam. Class A foam is a special formulation of hydrocarbon surfactants. These surfactants reduce the surface tension of water, which provides for better water penetration and increased effectiveness. When

aerated, Class A foam coats and insulates fuels, protecting them from ignition. Class B foam is used to extinguish fires involving flammable and combustible liquids. It is also used to suppress vapors from unignited spills of these liquids. As with all fires, there are advantages and disadvantages to using foam during fire suppression operations on landfills. The on-scene incident commander makes the decision to use foam based on the specific tactical situation at hand.

Multi-Agency Response

A major landfill fire will likely require the expertise of personnel from multiple agencies (e.g., the EPA, Department of Natural Resources). Some fire departments have Standard Operating Procedures in place that define all landfill fires as hazardous materials incidents, which require a specialized response. To ensure that all personnel (regardless of their agency affiliation) are operating according to the same plan, landfill fires require a strong Incident Command System.

Other Things to Consider Personnel Safety

Fires, particularly those underground, can undermine the integrity of the landfill, which could cause a collapse under the weight of landfill employees, firefighters or equipment. Such a collapse could necessitate a confined space, trench or other type of technical rescue operation in addition to fire suppression. Given the potential adverse effects of exposure to burning landfill contents or the smoke produced by a landfill fire, personnel may have to use specialized personal protective equipment, which may be difficult to obtain.

Access to and Maneuverability of Heavy Equipment

To access waste below the landfill surface or move burning waste away from the landfill, it may be necessary to use heavy equipment such as bulldozers. Landfill operators may already own this equipment and have staff trained in its use. If not, this equipment will need to be located and brought to the fireground. If a fire affects the structural stability of a landfill, operating heavy equipment on the landfill surface would be dangerous. Finally, depending on the landfill’s location and design, operating heavy equipment on the site could be quite difficult.

Logistics

As with any protracted fire suppression operation, Incident Commanders at landfill fires must address a variety of logistical concerns to facilitate operations. These include rotating personnel on a regular basis, compensating personnel for overtime spent operating at the landfill or filling in at fire stations in the jurisdiction, keeping firefighters on the landfill hydrated and fed, and keeping records for future reimbursement. (Depending on the nature and location of the incident, local fire departments can seek reimbursement from the federal government or the landfill operator for costs associated with fire suppression.)

Landfill Contents

Fires occurring in landfills where hazardous wastes are buried can be particularly difficult. In past years, illegal dumping of hazardous and toxic materials in landfills and other dumping sites was relatively common. When a fire occurs and rescue workers have wrong or misleading information about the buried contents (e.g., illegal or unknown toxic or radioactive wastes), the fire suppression operation can be extremely dangerous. | **WA**

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Transfer Stations

Second of Two Parts

Transfer Station Safety Issues

IN LAST MONTH'S ISSUE OF WASTE ADVANTAGE MAGAZINE (AUGUST 2012), we covered some important transfer station safety issues, including dealing with hazardous equipment, personal protective equipment, exposure to extreme temperatures, traffic and falls. This article will cover some additional safety factors to consider.

Noise

Unloading areas can have high noise levels due to the station's operating equipment, the unloading operation and waste movement, and customer vehicles. Backup safety alarms and beepers required on most commercial vehicles and operating equipment also can be particularly loud. The noise level also might cause customers not to hear instructions or warnings or the noise from an unseen approaching hazard.

Designers have limited options for dealing with the noise problem. The principal way to reduce the effects of high-decibel noise in enclosed tipping areas is to apply a sound-absorbing finish over some ceiling and wall surface areas. Typically, spray-on acoustical coatings are used. However, these finishes have a drawback. They tend to collect dirt and grime and are hard to keep clean and bright.

Using a rubber shoe on the bottom of waste-moving equipment buckets and blades and avoiding use of track-type equipment that produce high mechanical noise also limits noise. However, these approaches can affect the transfer system's operational efficiency.

Regardless of which approaches are employed, transfer station employees exposed to high levels of noise for prolonged periods of time should use earplugs or other protective devices to guard against hearing damage.

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52 WasteAdvantage Magazine September 2012

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Air Quality

Tipping areas often have localized air quality problems (dust and odor) that constitute a safety and health hazard. Dust in particular can be troublesome, especially where dusty, dry commercial loads (e.g., C&D wastes) are tipped. Prolonged exposure to air emissions from waste and motorized vehicles operating inside the building provides another potential health threat to facility employees. Facility air quality issues can be addressed through a number of design and operational practices. These include:

- Water-based dust suppression (misting or spray) systems used to “knock down” dust. Different types of systems are available. They typically involve a piping system with an array of nozzles aimed to deliver a fine spray to the area where dust is likely to be generated (e.g., over the surge pit). They typically are actuated by station staff “on demand” when dust is generated. Dust suppression systems can operate using water only or can have an injection system that mixes odor-neutralizing compounds (usually naturally occurring organic extracts) with the water. These dual-purpose systems effectively control both dust and odors. However, water-based dust suppression systems can have adverse economic impacts. The additional moisture added to the waste increases the weight of outbound loads, potentially reducing truck capacity and increasing costs. Use of handheld hoses to wet down the waste where it is being moved or processed, typically in a pit. Designers need to consider using convenient reel-mount hoses for this purpose.
- Ventilation systems can control air quality inside enclosed transfer buildings. While the high roofs and large floor areas common in transfer stations put unique demands upon ventilation systems, it is still possible through engineering techniques to create the air velocities needed to entrain dust particles. One approach is to concentrate system fans and air removal equipment above the dustiest and most odor-prone area to create a positive airflow from cleaner areas. Often, the air-handling equipment is designed with

multiple speed fans and separate fan units that can be activated during high dust or odor events. Filtering and scrubbing exhaust air from transfer stations is also possible.

If employees’ direct exposure to harmful emissions from vehicles and waste at the facility is not sufficiently minimized, respiratory aids such as masks might be necessary.

Hazardous Wastes and Materials

While MSW is generally nonhazardous, some potentially hazardous materials such as pesticides, bleach, and solvents could be delivered to a transfer station. Facility operators should ensure that employees are properly trained to identify and handle such materials. Some stations have a separate household hazardous waste (HHW) receiving and handling area. If the transfer station operates a program that manages HHW, the material is often collected by appointment only, during designated hours, or during special single or multiple day events.

All transfer stations need to be equipped to handle the occasional occurrence of hazardous waste, real or suspected, mixed with other wastes. Personal protective equipment such as goggles, gloves, body suits and respirators should be on hand and easily accessible to employees. Because staff or customers might inadvertently come in contact with a hazardous substance, it is also good practice, and often required by code, to have special eyewash and shower units in the operating areas.

Typically, the transfer station’s operating plan will outline detailed procedures to guide station personnel in identifying and managing these kinds of wastes. Many stations have a secure area with primary and secondary containment barriers near the main tipping area where suspect wastes can be placed pending evaluation and analysis. Public education efforts can reduce the likelihood of hazardous materials showing up in solid waste.

Ergonomics

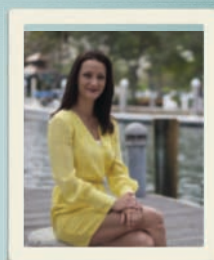
Improper body position, repetitive motion and repeated or continuous exertion of force contribute to injuries. Both employers and employees should receive ergonomics training to reduce the likelihood of injury. Such training provides guidance on minimizing repetitive motions and heavy lifting and using proper body positions to perform tasks. At this time there are no federal ergonomic standards.

However, a few states do have such standards under their job safety and health programs. The Occupational Safety and Health Administration’s Web site www.osha.gov includes a list of states with such programs and provides links to a number of these states’ Web sites. | **WA**

—www.epa.gov/osw/nonhaz/municipal/pubs/r02002.pdf.



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The CIRRUS accurately sorts targeted commodities using advanced identification algorithms and corresponding precise high-pressure air jets. It can be easily configured by the operator via a touchscreen interface and is offered in various sizes between 1200mm (48") and 2400mm (96"). The exact sensor configuration is tailored to the specific processing application. For example, an all-metal detector for ferrous, non-ferrous and stainless steel can be added, as well as for wood, for further sorting applications. The CIRRUS will be offered in conveyor and slide configuration.

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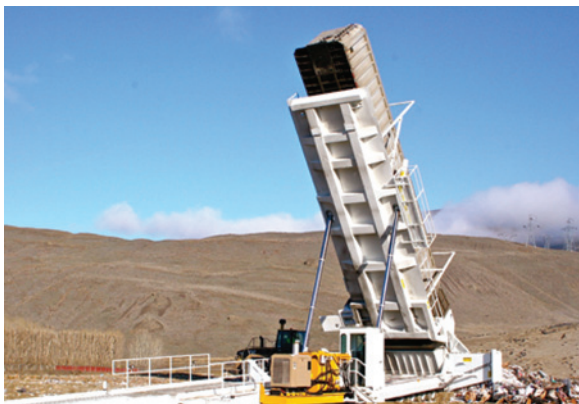


SHE-EDISON, LLC's (Aurora, CO) WasteBagger Pro™ lets you "Get a Handle on Your Bag" and is the ultimate waste cleanup tool for bagging any kind of debris (trash, paper, dirt, sharp objects, bottles/cans, unsanitary items, leaves, landscape debris) without bending, stooping, and twisting or touching wet or contaminated items with your hands. The kit includes the bagger frame with rim grips and wall mount.

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The wall mount can be installed almost anywhere, depending upon your needs. Quick, clean and easy, you can attach any brand of bag sizes 30 gallon or larger or use the eco-friendly reusable WasteBag accessory (sold separately) for filling composters and dumpsters. Made of powder-coated steel sheet metal, WasteBagger Pro is light and easy to use weighing only 1.5 pounds (frame with rim grips). They are great for all workers who need efficiency, cleanliness and increased visibility.

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