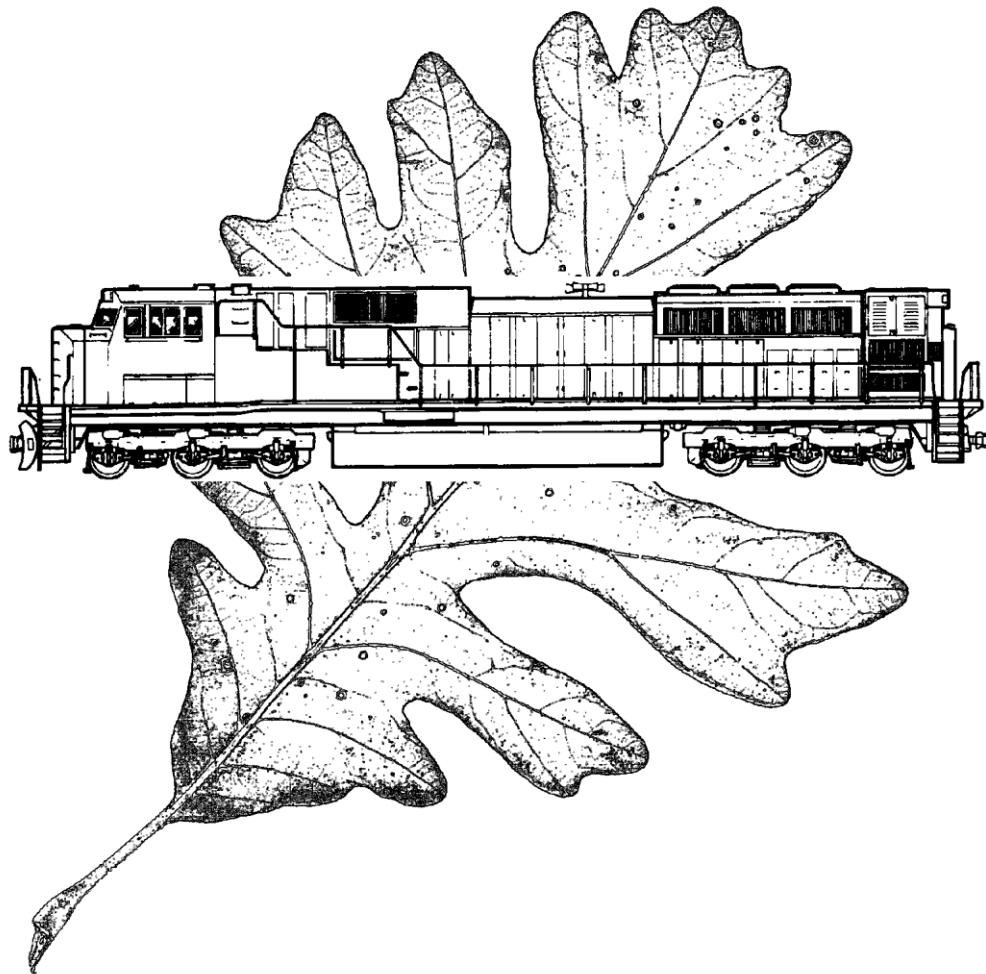


Railroad Environmental Conference 2003



Presentation Summaries

November 2003

University of Illinois at Urbana-Champaign

Tuesday 4 November 2003

ENERGY, EMISSIONS & AIR QUALITY

Kenneth A. Reich- Edwards & Angell

Roy Deitchman- Amtrak

Michael Stern - Amtrak

PANEL DISCUSSION: Emission Reduction Credits: A Way to Make Money While Cleaning the Air?

Railroads, as well as other industries, emit air pollutants that are regulated by the federal and state governments. Under a number of state and federal regulatory programs, sources of air pollutants which voluntarily reduce one or more pollutants in advance and in excess of regulatory or permit requirements, are entitled to an emissions credit equal to the amount of the reduction. The general requirement for creation of such a credit is that the emissions reduced be quantifiable, surplus (i.e. not already accounted for in an applicable state implementation plan), enforceable, real and permanent. Once created, an emissions reduction credit may be used by the source internally to offset future emission reduction requirements or traded to other sources. While most emission reduction credits have been created by stationary sources like factories and power plants, many states allow creation of such credits by mobile sources like railroads.

As the railroads implement cleaner diesel engines, review diesel fuel composition, use auxiliary engines (such as Green Goats) and similar emission reduction measures, there may be opportunities for creation of valuable emission reduction credits. Further, since diesel and electric emissions are sources of carbon dioxide (CO₂, which is a greenhouse gas), railroads are looking at ways to market emission reductions of greenhouse gases even in advance of federal regulations. There may be opportunities with non-governmental private greenhouse gas exchanges.

This Panel will survey existing state and federal regulatory programs regarding emission reduction credits, will look at the market for such credits and will discuss new opportunities to create and market credits for "greenhouse gas" emission reductions.

Julie Chiaravalli, Janet Yanowitz, Connie Sasala - Cameron-Cole

Ash Olesen – Canadian Pacific Railway

Meeting the Association of American Railroads' Goal for Greenhouse Gas Emissions Reduction

In February, 2003 the Association of American Railroads (AAR) voluntarily committed to reducing the intensity of greenhouse gas (GHG) emissions by 18 percent by 2012, as part of President Bush's "Climate VISION" initiative. According to statistics released by the Federal Railroad Administration and the DOT Center for Climate Change and Environmental Forecasting, the transportation sector is currently responsible for approximately 27% of GHG emissions in the US and is expected to be one of the fastest growing sources in the foreseeable future.

An inventory of greenhouse gases is a compilation of an organization's GHG emissions and sources, which can provide solid foundations for commitments to demonstrate innovative technologies and a business case for climate solutions. Both the U.S. Department of Energy (DOE) and the World Resources Institute / World Business Council for Sustainable Development (WRI/WBSCD) have developed detailed protocols for identifying and calculating GHG emissions. Cameron-Cole will present current best practice to show how existing guidance and tools of the different protocols can be used by railroads to develop a credible GHG inventory (based on a case study for the logistics wing of a major automobile corporation). A GHG inventory will provide internal management with valuable information on which to build an effective strategy to assess and reduce GHG emissions to meet AAR's goal.

Expectations regarding the effectiveness of improvements in engine efficiency, rail lubrication, and the development of idling reduction technology in meeting AAR's commitment to an 18% reduction in GHGs will be examined.

Stephen Ciatti, Frank Stodolsky and Linda Gaines – Argonne National Laboratory

Promising R&D Areas for Reducing Freight Railroad Energy Consumption

With the help of the railroads and equipment manufacturers, the Department of Energy undertook an effort to identify significant opportunities to reduce energy use and emissions for rail freight transport. A workshop was held in 2001

and followed by a series of working group meetings to discuss the major topic areas: diesel engines, locomotive systems, train systems, and advanced power plants and fuels. Information supplied by the working groups was integrated into a roadmap to outline the potential research areas. Some of the most promising areas identified include dynamic brake energy recovery, idling reduction, friction reduction, and better train and consist management. This paper outlines findings of this study.

Linda Gaines – Argonne National Laboratory
Reduction of Impacts from Locomotive Idling

Freight locomotives are idled to keep them warm and avoid starting problems, to keep air brakes charged, to provide space conditioning if the crew is on-board, and to keep the toilets from freezing. They are idled as much as 75% of the time; this consumes about one fourth of the energy and produces a similar percentage of emissions from switchers. Railroads are therefore investigating ways to reduce idling both to save money on fuel and to help them meet EPA emissions regulations. Several innovative approaches to idling reduction are examined and compared here. These include auxiliary power units, automatic shut-off units, and hybrid locomotives.

Mads Bergendorff - Union Internationale des Chemins de fer
Environmental Indicators for Railways - A European Perspective

NOISE AND VIBRATION

Peter Conlon – Railway Technology Consulting Associates
Railway Environmental Noise and Vibration-History and Trends

Railway operations create noise. There's no way to achieve silent train operation and still run trains with steel wheels on steel rails. Vibration is also present, though usually much less noticeable. The effects of noise and vibration from new and expanded train operations are a major concern, particularly in densely populated urban areas. As railways around the world expand and apply new technology for better service, there are increasing efforts at understanding and controlling noise and vibration sources. High-speed electric passenger train operations in Europe and Japan are the focal point for most of the current research activities. Noise control of conventional freight and passenger transportation activities in the United States has been an important part of new technology development. Freight and passenger rail operations have been subject to federal standards and regulations since 1981. Efforts were already underway to address noise and vibration from subway and light rail transportation operations and continue to this day. This paper reviews the regulations currently in effect in the United States and explores some of the research activities associated with noise and vibration control from railway operations.

Carl E. Hanson - Harris Miller Miller & Hanson Inc
Ground-borne Vibrations from Freight Trains in Urban Areas: Public Perception vs. Reality

The complaint about “vibrations” in homes near railroad tracks has long been a key issue between communities and railroads. This presentation describes three typical situations where vibration effects were mis-identified by nearby residents:

1. “The ground vibrations are worse in the winter when the ground is frozen.”
2. “The ground vibrations cause my house to shake, and I am over 400 feet away from the tracks!”
3. “Idling locomotives in the yard shake my house.”

An example of an investigation of each case will be presented where the outcome was different than initially supposed.

POLLUTION PREVENTION

Tim Lindsey– Illinois Waste Management Research Center
Waste Reduction in Aqueous Parts Washing: New Technology Developments

Existing systems for delivering and purifying industrial fluids are based mostly on “out of process” or “off-site” treatment and disposal processes performed either by the employees who use the processes or by independent service providers. Such systems are inefficient, expensive, wasteful and hazardous to employees and the public. The systems described in this presentation have been developed by the Illinois Waste Management and Research Center. They can achieve significant cost reduction through reduced chemical usage and reduced waste. The technologies utilized in this system will continuously purify fluids as they are being used. No additional process steps are needed and no additional mechanical devices are required. Companies that take advantages of these technologies experience improved compliance with environmental and safety regulations through less worker and public exposure to hazardous substances. This system is simple to comprehend, compatible with existing industrial operations, easily observed through brief demonstrations and well suited to pilot trials that will reduce uncertainty and facilitate adoption of the innovations.

The existing market that provides equipment and chemicals for managing industrial fluids is heavily fragmented with little ongoing innovation. A conflict of interest exists with most equipment and chemical suppliers (in many cases they are the same entity) that prevent them from implementing innovations that reduce chemical usage. Chemical supply, in particular, is a very lucrative enterprise for many of the major players in this market. Therefore, innovations that reduce chemical usage and subsequent waste generation are generally met with a great deal of skepticism. Consequently, attempting to achieve market penetration of the innovations to be used in this venture through existing market channels would likely be futile. These innovations will almost certainly be very disruptive to existing business cultures and markets.

Ken Rose - Cameron-Cole,
Kim Keeling and Lanny Schmid -Union Pacific
Pollution Prevention at a Major Railyard

The process of pollution prevention has been a major focus and part of the corporate culture at Union Pacific Railroad (UPRR) for over two decades. Pollution prevention refers to the practices that reduce or eliminate the generation and release of hazardous substances or wastes into the environment and is currently being promoted by the U.S. Environmental Protection Agency (P2 Program) in response to the Pollution Prevention Act of 1990. This can be accomplished through several mechanisms including waste minimization, recycling and waste treatment. Successful pollution prevention can have significant economic, regulatory and reputation benefits for proactive companies. The first requirement for a successful pollution prevention program is the ability to identify and inventory the nature and quantities of wastes generated in processes associated with routine railyard operations.

This presentation summarizes the results of a cooperative effort to complete a comprehensive inventory of waste-generating activities at a major railyard. In the course of this effort, a step-wise process of evaluation was utilized where information gathered in each step was used to target information gathering in the subsequent steps:

- 1) Identification of typical railroad waste-generating operations with associated waste types.
- 2) Identification of industry standards for pollution prevention in railroad and related industries.
- 3) Quantification and documentation of specific railyard waste-generating operations.
- 4) Classification of hazard type and ranking for each waste type.
- 5) Verification and documentation of findings in the field.

The procedures determined in this cooperative effort represent a practical approach to the identification, quantification and categorization of wastes. This data can be used in ongoing efforts to determine the most cost-effective and efficient methods for reducing waste volumes and reducing associated toxicity with wastes before they leave the railyard. This can involve substitution of more hazardous substances, more efficient practices in waste-generating operations, recycling of materials, or treatment prior to disposal. As pollution prevention alternatives are developed at the railyard, the existing and continually updated inventory will serve as an integral component for planning and completion of alternatives.

Donald E. Cregger - Norfolk Southern Railway
Soy Beans Improve Track Lubrication Efficiency

Grease is used to lubricate the rails in curves to control rail and wheel wear associated with passing trains. Trackside lubrication equipment, actuated by train wheels, pump the grease to applicator bars fastened to the rails. The grease is transferred to the flanges of passing wheels and is applied to the gauge face of the rail when flange contact occurs.

Track lubrication grease has traditionally been petroleum-based. However, an environmentally friendly, soybean oil-based grease has recently been developed. This product, called SoyTrak, is manufactured by Environmental Lubricants Manufacturing (ELM) and was developed via the cooperative efforts of Ag-Based Industrial Lubricants (a research group of University of Northern Iowa), Portec Rail Products, Inc and Norfolk Southern. This grease is at least equal to petroleum greases with respect to track lubrication performance, and it is superior to the petroleum greases with respect to some physical performance and environmental characteristics. The most notable efficiency improvement concerns the rapid decomposition of the SoyTrak product after it has served its purpose in lubricating the gauge face of the rail. The residuals decompose in a matter of weeks unlike petroleum greases that do not readily decompose, but continue to build-up within the track structure. This accumulation of wasted grease becomes significant considering that some railroads purchase more than a million pounds of grease annually. The soy grease also has a lower coefficient of friction as compared with petroleum grease, and it is more durable at higher temperatures. These characteristics produce greater performance efficiencies in terms of increased durability and decreased coefficient of friction in the high pressure and temperature environment of wheel to rail contact. Lower friction translates into reduced curve resistance and greater energy efficiency.

Francis J. Brady, Richard S. Merryman, and Imran M. Jaferey- Koch Membrane Systems
Rail Transportation Industry Washwaters Treatment, Recovery and Recycle Using Ultrafiltration Membrane

The treatment, recovery, and recycle of internal and external rail car and engine maintenance cleaning solutions through membrane technology is a well established application with several advantages: fresh water usage is decreased significantly; maintenance, waste hauling, heat energy, and chemical usage costs are reduced; waste is recovered as essentially fresh cleaner; and cleaning consistency is improved. Designed as either a point source or end-of-pipe waste treatment method, membrane technology will decrease, and often eliminate, loading and costs on downstream POTW's and other effluent treatment processes.

The ultrafilter (UF) operates as a kidney. As rail cars and parts are cleaned, spent cleaning solutions with dirt and oil are fed to the UF membrane system where colloidal and suspended solids, greases, and other contaminants are separated out. Membrane filtrate (permeate) contains excess and dissolved cleaner chemicals and is returned to the cleaning process. This relatively tough duty application calls for the use of membranes designed to optimize performance in terms of cost, ease of use, cleanability, energy efficiency, and maximum solids concentrate.

This paper surveys the performance of membrane systems operating on wastewaters at rail transportation industry sites. Productivity, filtrate quality, and operating costs on a number of installations show that membrane filtration is an economically viable and accepted technology for this industry.

STORM WATER AND WASTE WATER

John Brinkley and David Schaad- Marshall Miller & Associates
Lohman Thompson- Norfolk Southern Railway
Improving Stormwater Collection Efficiency for Fueling Platforms at Rail Yards: A Cost-Effective and Aesthetically Appealing Approach

Fueling operations and maintenance activities performed on locomotive engines at rail yards can result in the deposition of diesel fuel and sand in and around the tracks. Many facilities are upgrading their fueling platforms to prevent these constituents from migrating off-site through either seepage into the ground, stormwater runoff, infiltration into aging subdrainage systems consisting of perforated piping with impervious liners, or other transport mechanisms.

Rail yards are typically constructed in low lying areas on fill material with minimal relief in the topography and are often adjacent to a receiving stream or river. The installation of new collection inlets and piping between the tracks typically does not provide a means for readily determining if there is a failure in the piping, nor does the system provide easy access for maintenance. In a unique application in Macon, Georgia, where approximately fifty-five locomotives are fueled daily, the current subdrainage system is being replaced with a concrete pad which slopes to a center French drain system. This grated center draining system in turn slopes to in-line grit traps prior to discharging to

an existing treatment system. The drain system is readily accessible and can be easily cleaned and maintained while shedding water into the central collection system.

Ian Howkins, Lucy Pugh, and Lori VanderKam – Earth Tech

Case Study- Treatment System Design and Upgrade to Address Environmental and Operational Issues

Railroad facilities routinely address operational and environmental issues. Norfolk Southern Railway Company (NSRC) upgraded their water treatment system in Melvindale, Michigan to address both operational and environmental concerns in 2002. The environmental issues required approval and coordination of several Michigan Department of Environmental Quality (MDEQ) divisions since the system addressed storm water, groundwater and process water. Groundwater is recovered from a 1000-foot long interceptor trench that was installed to prevent off-site migration of impacted groundwater. Storm water and process water continued to be collected using the existing infrastructure; however, the water from the existing collection systems was incorporated into the upgraded treatment system.

The multi-stage treatment system includes oxidation of iron, polymer addition to improve iron settling, an API gravity oil/water separator, organo-clay, and activated carbon for final removal of remaining dissolved hydrocarbon removals. The final effluent is discharged through a National Pollutant Discharge Elimination System (NPDES) discharge permit. The system was designed to handle a maximum flow of 60 gallons per minute in conjunction with a 15,000-gallon equalization tank to handle storm events.

Work continues at the site in 2003 with an upgrade to the fueling facility to both improve operational capabilities and minimize environmental impact.

Mark D. James, Mikael J. Perrodin- Burlington Northern and Santa Fe

Chris Evensen - Kennedy/Jenks Consultants

Solving A Unique Lagoon Discharge Problem: A Teamwork Approach

In the mid-1990s, spring discharges to the Whitefish River from the three-cell lagoon system at BNSF's fueling facility in Whitefish, Montana, exceeded Montana Pollutant Discharge Elimination System (MPDES) limitations for Total Suspended Solids (TSS).

TSS and temperature data revealed that the exceedances were caused by a cold-region phenomenon known as "spring turnover." In brief, water is densest at 39°F, and when the water near the surface of a lagoon reaches this temperature in the spring or autumn, it displaces the water at the bottom of the lagoon, resuspending settled solids in the process. Other factors contributing to the problem were poor hydraulic characteristics, shallow depth, limited operational flexibility, generally poor lagoon conditions, run-on, and site snow removal practices.

BNSF's managers of environmental operations, engineering, and remediation, along with an outside consultant, formed a working team that consistently applied the "KISS" principle while identifying the various factors contributing to the Whitefish problem. The result was a multi-faceted solution set of structural, management, and operational best management practices (BMPs) that successfully and efficiently brought the facility discharges into compliance with MPDES.

A lagoon rehabilitation design was developed to increase lagoon depth and improve hydraulics via flow control structures, a 60-mil HDPE lining, and re-grading. The design also included a 2-for-1 underdrain system that facilitated not only lagoon operation, but also an ongoing site environmental remediation project.

The annual operation and maintenance (O&M) procedure is absolutely critical to the project's success. This simple, 3 step-procedure is posted on a 4' x 8' sign that clearly outlines the steps that must be taken every summer to prepare the lagoons for seasonal turnover.

In the 6 years since the lagoon improvements were completed, the environmental operations manager has ensured that the prescribed O&M procedure is followed every summer. The results: 6 years of consistent compliance with MPDES and implementation of a successful good neighbor policy!

Phyl Kimball - Ultratech

Railroad Compliance With New Stormwater Management Regulations

An important aspect of the EPA's Clean Water Act directly relates to "stormwater runoff". It is estimated that 70% of all storm drains in the U.S. are channeled directly into open waters (rivers, lakes and oceans). Many millions of pounds of sediment, oil and other contaminants flow into our waterways annually.

Known as the "National Pollution Discharge Elimination System Stormwater Program" (NPDES), these regulations require that railroads employ "Best Management Practices" (BMP's) to minimize the discharge of sediment, oil, waste chemicals and other pollutants into our waterways.

Railroads and some 450 other SIC codes are now required to submit a "Stormwater Pollution Prevention Plan" (SWPPP) to the state or federal EPA. This plan is basically an erosion, sediment and waste chemical control plan. Areas of concern at a rail facility include: fueling stations, maintenance facilities, locomotive repair shops, railcar repair and cleaning facilities, wash racks, parking lots, equipment storage areas, chemical storage and waste oil collection areas, and construction projects.

The proposed discussion will focus on the requirements of an SWPP Plan and will use a Powerpoint Presentation to provide various examples of baseline and advanced BMP's. The discussion will focus on numerous practical, cost-effective solutions to help railroads comply with the NPDES Stormwater Regulations.

The EPA has been extremely proactive in its efforts to educate industry and the public in general, about the need to eliminate pollution from our water supply. Christine Todd Whitman, Administrator of the EPA, stated on March 28, 2002: "I think water is going to be the biggest environmental issue that we face for the 21st century in both quantity and quality". The NPDES Stormwater Regulations are a fundamental building block to address this important issue.

The EPA has recently begun to enforce these regulations. Significant fines have been levied against Home Depot and Walmart for violations of stormwater regulations in recent months. In San Francisco, an individual can be fined \$ 25,000 for dumping oil into a storm drain. Stormwater management is a very serious issue.

Cities and industrial concerns are now creating a new title within their environmental departments, that of "Stormwater Manager". Railroads are now aware of their need to comply with the Stormwater Regulations and are beginning to be proactive.

This discussion will push a "hot button" with those attending the 2003 Railroad Environmental Conference and will provide significant value to attendees.

Wednesday 5 November 2003

COMPLIANCE

Robert Fronczak - Association of American Railroads
Review of Current Railroad Environmental Issues

The Association of American Railroads (AAR) represents the freight railroads in North America. Our members include the railroads that operate 76 percent of the line-haul mileage, employ 90 percent of the workers, and account for 93 percent of the freight revenue of all railroads in the United States; and Amtrak. We also represent the Canadian railroads through the Railway Association of Canada, and three Mexican railroads including Ferromex, Ferrosur, and TFM. This presentation will discuss current regulatory, legislative, environmental awareness, and pollution prevention initiatives at AAR. Regulatory activities include the metal products and machinery, and construction and development effluent guidelines, off-road diesel fuel regulation, as well as recent developments in the area of spill prevention control and countermeasure plans. On the legislative front, AAR has been tracking the energy bill to make sure research funding is authorized for locomotive emission and energy research. Environmental awareness activities include the John H. Chafee North American Railroad Employee Environmental Excellence Award, and a new for professional railroad employees in 2003. The cost survey, and railroad environmental conference also fall into this category. Pollution prevention initiatives include the development of an accurate locomotive fuel gauge. A new research initiative will include a major effort on locomotive emissions and energy. Voluntary programs include the Smartway program, and a voluntary commitment to the White House Council on Environmental Quality to reduce greenhouse gas emission intensity by 18% by 2012.

Kevin Grant and Christopher LoRusso - Amtrak
Perspective on Three Years of Environmental Auditing – Results and Evolution

After conducting 64 Environmental Audits of its operations and facilities, Amtrak's Environmental Auditing Program (EAP) is evolving into a beneficial management tool producing improved environmental performance and management practices. The EAP commenced under a consent decree with the US EPA, and key components of the audit program have been disclosure of the audit findings to the Agency; a systemic assessment of findings; and, a corrective action program verifying closure of findings. This paper examines the history of the EAP and its future. Entering its fourth year, the EAP will emerge from the EPA consent decree with a focus on metrics, measurement and beneficial results.

Melvin Burda - Burlington Northern and Santa Fe Railway
Environmental Compliance and Business Decisions

As we all know, environmental compliance is just good business. Compliance means that your company, operations or clients are meeting the minimum regulatory requirements as set forth by Federal, State, Provincial and local Agencies. The costs associated to these activities are well understood and simply part of doing business. What is not so clear is the cost of a proactive environmental initiative or program.

Have you experienced the environmental epiphany event? When it becomes clear to you that a proactive program is just what your company or client needs. You're confident this program will set new goals and standards for the industry and that this program will set you apart from everyone else. You will be the envy of all your peers. You put your heart into your work as you plan and develop the program. After you have put many hours into the effort it is time to present it to your management team. You enthusiastically start the presentation. But within minutes the questions start coming in. Cost, personnel and timeline dominates the discussion. The presentation is cut short when the senior person states that they can not see the benefit of the program.

What went wrong? Was it a bad idea? Did introducing this program lose you or your department political clout? What should have been presented to make a business decision?

This presentation will look at several business driven decision-making processes to help better understand the relationship of proactive environmental programs and the relationship to running a successful business.

Evan Fitzgerald and Thomas Kunes - Kestrel Management Services
Creating Business Value with Environmental Audit Programs

Environmental compliance audits have become a necessary component of environmental compliance management programs. It simply is not possible to gauge a company's environmental performance without conducting audits. Leading companies have created extensive audit programs with aggressive schedules and diligent follow-up. Some companies have hired 3rd party consultants to conduct their audits or conduct internal audits with company staff.

However, most environmental compliance audit programs fall short in managing the flood of information these programs generate. The fact is this information is rarely treated like data. Instead, it's typically treated as an isolated snapshot of environmental compliance at that facility resulting in corrective actions that often fail to resolve the root causes.

When a business decides to undertake an audit program, it should answer some basic questions.

What actions will I take to resolve findings from the audit?
What assurances will I have that the audits were thorough?
How can this information be used to prevent future compliance problems?

Unless findings are treated like data and appropriately analyzed, the audit program will fail to realize its potential value to the business.

Some of the greatest business value comes from using the results of an audit system to identify patterns and trends. This allows the findings to uncover fundamental environmental management system components that are missing or require improvement allowing preemptive changes to problems before compliance issues arise. By analyzing audit data so those deficient components are identified, one can design corrective and preventive programs that consistently achieve day-to-day compliance excellence.

Jeffrey Lanan, - TRC Environmental
Internet Database Management of Asbestos Assessment Survey

Kansas City Southern Railway Company (KCS) was faced with delineating asbestos-containing building materials across its entire operating system. KCS requirements for the project included a local, qualified consultant (single point-of-contact) that understood KCS's specific needs and the railroad industry, with a high level of technical knowledge in the asbestos field. KCS selected TRC Environmental Corporation (TRC) to implement this project, which involved an asbestos assessment survey of all 575 buildings currently occupied by (KCS) employees, totaling approximately 973,430 square feet.

A major scope requirement by KCS was that all reports be provided in an electronic format. Therefore, an Internet-based database was selected as the reporting format providing the following utilities:

The same data and information can be viewed or manipulated by multiple users since the data is resident on a single server.

Analysis and reporting capabilities allow users to access the data in many different modes, and to output validated data to a variety of formats easily and reliably.

Vital information, such as digital photographs and electronic versions of building plans depicting sample locations and locations of asbestos-containing materials, are easily accessible through the database via hyperlinks.

The database can be updated to reflect new information, such as abatement activities, thus preventing confusion regarding the status of a particular site or building.

The project was deemed successful by being completed on time and under budget. The Internet-based database is currently being utilized by KCS and TRC to determine what materials, at which locations should be abated.

Lori L. Upgren and Megan A. Penterman - RETEC
Tom Rigg - Burlington Northern and Santa Fe Railway
An Effective Approach to 101 TSD Compliance Assessments

BNSF and RETEC worked together to perform desktop compliance assessments of 101 TSD Facilities. The goal of the project was to review the facilities' compliance parameters and select facilities for on-site audits. The project challenges included obtaining and managing information from a large number of facilities and their regulators across the country within 6 months.

RETEC developed an approach that would enable the project team to evaluate the risks associated with the facilities and complete the project efficiently. The project team created protocols and an Access database to collect and manage the information. The facilities completed self-assessment questionnaires to provide key aspects about their compliance program, including their regulatory contacts. Once the questionnaires were returned, the facility data was entered in a database, which enabled the project team to share information, track progress, and produce summary reports. Based on the results of the compliance assessments, BNSF and RETEC were able to select a handful of sites for on-site visits. This presentation will explore the challenges.

ENVIRONMENTAL MANAGEMENT SYSTEMS

Michael Bittner - ERM
Rick Nath - CSX
How to Create an EMS for the Modern Railroad

CSXT recently combined its Environmental Department and Hazardous Material Systems Department to form one, streamlined department – the Environmental and Hazardous Material Systems Department. This led to a review and improvement of CSXT's environmental management system (EMS). To improve environmental and hazardous material (EHM) performance, CSXT developed a customized EMS Standard that incorporates key elements of the USEPA NEIC (National Enforcement Investigations Center) Compliance-Focused Environmental Management

System, as well as key elements of world class environmental management systems such as ISO 14001 and the American Chemistry Council's Responsible Care®. The EHM management system provides the framework to assure regulatory compliance and minimize the impact of CSXT's operations to the environment and the communities in which it operates.

Five years ago, environmental management systems were viewed as cutting edge, the province of the environmental vanguard. Today they are viewed as the foundation of a successful environmental program. This presentation illustrates how to design and implement a company-specific EMS that meets the unique challenges of the modern railroad.

Topics include:

Creating an EHM vision for the company

Framing the environmental management system

Developing the EMS standard

Implementing the EMS in the face of competing demands for time and resources

Integrating 6 Sigma and cost reduction strategies into the EMS

Tools and techniques for designing and implementing an EMS will be reviewed during the presentation using CSXT's EHM Management System as the primary example.

Camille Ross

The Business Case for Facility and Environmental Information Systems

Providing geographic coverage for day-to-day operations is a challenge for any compliance activity, but these challenges expand when considering environmental and safety compliance for railroads. Ensuring and monitoring compliance over multiple jurisdictions, and for both facilities, and miles of track creates immense amounts of information. This information then needs to be summarized, evaluated and analyzed to assess opportunities for improvements. With the ultimate goal begin improved on-time performance, minimized regulatory non-conformances, and reduced cost – in other words Risk Management.

This presentation will highlight the way Amtrak is using their Facility Mapping and Environmental Information Systems to manage their environmental risks. Areas that will be describe include where and how administrative, operational, and risk mitigation opportunities were identified from the information system, and where additional areas of "pay-back" were found.

William Tokash - RETEC

PANEL DISCUSSION: Responsible Care Management Systems - Upcoming Third-Party Certification Requirements and the Impact on Responsible Care Partners

The American Chemistry Council adopted Codes of Practice for both ACC members and partners in the early 1990s. These Codes of Practice have served as guidance on effective chemical handling and management practices for both chemical manufacturers and truck and rail transporters. Since then, most Class I railroads have adopted the Codes of Practice for the rail transport of chemicals.

Currently, the ACC is moving from voluntary Codes of Practice towards mandatory third-party certification of a Responsible Care Management System. Two separate systems have been developed by ACC: the standard Responsible Care Management System (RCMS) and Responsible Care Management System: ISO 14001 (RCMS 14001), which will result in a certification that will be address ACC and ISO 14001 requirements. ACC is currently developing criteria for third-party certification of auditors as well as the parameters for multi-site certification. In addition, the ACC Work Group for RCMS has a subgroup comprised of Class I Railroads who are working on the scope of RCMS & RCMS 14001 for Responsible Care Rail Partners.

A 5 to 7 person panel will be assembled with representatives from the following stakeholders to discuss the impact and approach to these emerging requirements.

ACC Company EHS Managers

ACC RCMS and RCMS ISO 14001 Work Groups
ACC Rail Partners RCMS subgroup
Class I Railroad EHS Managers

Lyle Staley - Burlington Northern and Santa Fe
Mick Bilney - Frontier Environmental

Assessing and Understanding Environmental Management System Operating Capability at the Facility Level

It is relatively easy to describe the elements of your environmental management system and what it is designed to accomplish. But it is another thing entirely to define the capability for facility personnel to function within the system structure and help you operate the system so that it works effectively. Understanding their capability is critical in order for you to provide them with the right customer service and tools to help them. Conducting a capability assessment to gather the information is the first step towards achieving a deeper understanding of your customer's point of view. Understanding their point of view and their needs is necessary if you are to effectively manage your EMS and reduce risk.

This presentation will cover how you can design and conduct a Capability Assessment at the operating level, evaluate your results, and take action to improve your performance. During this process you should consider the culture and working practices at a facility. Identifying underlying attitudes will help you understand why past activities or program efforts may have fallen short or never have gotten off the ground in the first place. With the understanding you gain you can help the facility identify, assess, prioritize and manage their environmental issues. Additionally, you can strengthen the management process at the facility level, identify effective measures, and support the facility in their efforts to improve environmental and operating performance.

Stacy Carr, Cory Gendron, Toby Burkett - Trinity Consultants

Needs Assessment and System Selection for and Environmental Management Information System

To assist with on-going environmental compliance management, many companies have identified the need for a system that serves as a central repository for environmental data. The initial approach may be a system of spreadsheets that provide an overview of each site's equipment inventory, regulatory authorization, and required compliance-related action items. Drawbacks to spreadsheets include access rights, version problems, outdated information, and limited functionality. More robust Environmental Management Information Systems (EMIS), including off-the-shelf and custom-developed solutions, are designed to grow with a company's changing environmental needs.

To select and implement a successful EMIS, an organization should consider several steps. The following list identifies some sample steps.

Needs Assessment

- Justification
- Key Stakeholders
- Sources of Data
- Identification of needs

System Selection

- Analyze Potential Solutions
- Software Recommendation
- Pilot Implementation
- Acceptance Testing

Full Rollout

Once the need for an EMIS has been justified, the key stakeholders have been selected, and the current data sources have been determined, an organization should identify needs. In this most critical step, the organization should identify and prioritize the environmental, information technology (IT), and business-related requirements for the system. The following list includes sample requirements.

- Emission Calculation Capabilities
- Equipment Tracking Capabilities
- Facilitate Electronic Reporting

Data Export Functionality
Compliance Task Reminders (Email Notification)
Scalable and Flexible Solution
Software Vendor Company Stability

This paper details sample steps for performing a needs assessment and selecting a successful EMIS.

TRAINING

David Boram, Vince Alaimo, and Jess Powers - Marshall Miller
Larry Western - Norfolk Southern
Equipping the Masses: Environmental Training and Compliance Issues

Compliance with multiple environmental regulations has become an ever-increasing burden placed upon industries throughout the United States. Compliance requirements associated with the Clean Water Act (CWA) and its derivatives (e.g., Oil Pollution Act) and multiple amendments have become particularly complicated. This is especially the case for multiple state, multiple facility industries such as those associated with the Norfolk Southern Railway Company (NSRC). One very important facet of environmental compliance involves the training of the employees located at these NSRC facilities.

Environmental training required by the CWA begins with the federal law and associated requirements. This training should be specific to a particular facility's CWA-required documents including Facility Response Plans (FRPs), Spill Prevention Control and Countermeasures (SPCC) Plans, and Storm Water Pollution Prevention Plans (SWPPPs). Training is intended to not only provide plan familiarity (i.e., "refreshers") for the employees, but to reinforce the need to conduct daily facility operations in compliance with relevant environmental regulations.

NSRC faces not only federal compliance burdens, but must comply with state and local environmental requirements as well. Many states with U.S. Environmental Protection Agency (EPA) delegated authority will often impose state and local requirements (documents, training, inspections, auditing, etc.) that would not ordinarily be required by the federal statutes. These multiple levels of requirements place a tremendous and often times complicated and confusing burden on NSRC's employees in their attempts to achieve compliance and avoid fines and penalties. Although often a requirement associated with specific regulations, training staff members represents an effective tool to address this ever-increasing burden placed on the employees.

A comprehensive, system-wide environmental training program tailored to each NSRC facility's operations will not only meet the compliance requirements but will also enlist employee buy-in by addressing potential operational deficiencies that could potentially lead to noncompliance. Regular, consistent reinforcement of the environmental regulations through classroom presentations of the basics, regulations reviews, questions and answer sessions, "hands on" facility inspections, and tabletop drills and exercises, provides an opportunity for all NSRC facility employees to contribute to the manner in which day-to-day operations ensure the protection of human health and the environment.

Chester Culley and Paul Kuhlmeier—Kansas City Southern
Interactive Training Module for Railroad HAZMAT Response

Since the early 1980's the railroad industry has relied upon on-site contact training methods for educating HAZMAT responders. The industry-sponsored school in Pueblo Colorado has served as the cornerstone for this program. The Kansas City Southern Railroad is in the process of developing an interactive tool based on state of the art visualization software that will enhance and extend the methods applied to date.

The DVD or web based software presents three-dimensional animation of a simulated derailment that results in the loss of interchangeable chemicals. An accompanying storyboard introduces the student to basic first response conditions, decision processes, and resulting consequences. Based on the current version of 3D-Studio Max software, the Technology Transportation Center (TTC) No. 1 derailment is recreated in a selected environment such as urban, rural, or over water. The visualization software coupled with the vessel analysis package, REACTOR, accurately simulates car behavior through use of car physical dimensions, velocity, derailment dynamics, and ultimately chemical release.

This beta test product is intended to represent the initial development phase of a tool which can be expanded to enhance overall training and refresher of responders through:

- Allowing railroad responders to refresh critical concepts via DVD at their work locations
- Creating an outreach mechanism to United States or international responders through web based presentation
- Providing a more interactive training tool for lectures within the TTC or other fixed facility outlets

REMEDIATION (part one)

Kristopher J. Nolan and Lori VanderKam– Earthtech

The Use of the Induced Polarization (IP) Geophysical Method to Determine the Presence of NAPL in the Subsurface at a CN Rail Site

Induced Polarization (IP) profiles were conducted at a railroad facility where Non-Aqueous Phase Liquids (NAPLs) are suspected of being present in the subsurface. The purpose of this investigation was to determine if the IP geophysical technique could detect the presence of NAPL, and therefore reduce overall investigation and drilling costs. Petroleum NAPLs have dielectric constants that are at or below 2.2, in comparison to water which has a dielectric constant of 84.2. It is hypothesized that the dielectric properties of these NAPLs would allow them to act similar to the dielectric seen in a capacitor. That being the case, the NAPL would be detectable using the IP method in non-or low-electrolytic soils like sands and silty sands. The results of the IP investigation yielded areas of elevated chargeability that correlated with zones that were identified as potentially containing NAPL. Subsequent soil and groundwater analytical samples collected from the investigation area showed NAPL existed in the subsurface. As a result the IP geophysical method has been useful in quickly determining the presence of NAPL, and therefore reducing overall investigation time and costs.

Gibson Barbee - Norfolk Southern

Bob Huguenard - Camp Dresser & McKee

Environmental Management Lessons Learned During Redevelopment of a Large Brownfield Site

This presentation highlights some of the lessons learned during the redevelopment of the Carlyle Site, a 75-acre mixed-use brownfield site in Alexandria, Virginia.

Carlyle Development Corporation (CDC), an affiliate of Norfolk Southern Corporation, conceived plans for redevelopment of the Carlyle Site in the late 1980s and began redevelopment work with environmental management assistance from Camp Dresser & McKee Inc. (CDM) in the early 1990s. The Carlyle Site had a long history of industrial and commercial uses starting prior to the Civil War. Historic land uses at the site included landfilling, scrap yard operations, and rail yard operations as well as other commercial and industrial uses. It is also reported that a field hospital was located at the site during the Civil War.

The Carlyle site is an upscale mixed use commercial/residential development that includes mid rise office buildings, upscale high-density residential buildings, and retail space. About one-third of the property is currently developed and occupied, another one third is currently under development, and the last one-third will soon be under development. A large portion of the current development is associated with the new United States Patent and Trademark campus at the Carlyle Site, which will include about 2 million square feet of office space. Due to the size of the Carlyle Site, CDC and CDM were able to adjust the approach to environmental management and improve the outcome with each new phase of development. Consequently, many valuable lessons were learned along the way. This presentation will examine the role of environmental management at each step in the development process (e.g., master planning, infrastructure, property transfer, and property development), and summarize ideas that allowed us to more effectively achieve the overall financial and environmental goals.

Thursday 6 November 2003

REMEDIATION (part two)

Minoru Shimura, Toshio Hayakawa, Takashi Kyotani, Tomoyoshi Ushioji and Kazuhide Kimbara - Railway Technical Research Institute

PCB Decomposition Using a Combination of Photodechlorination and Biodegradation at RTRI in Japan.

Polychlorinated biphenyls (PCBs) are well known environmental pollutants and railway companies in Japan has phased out and stored many electrical devices containing PCBs. We have isolated several PCB degrading bacteria from the environment and have investigated the use of these organisms for PCB detoxification. Although microbiological degradation of PCBs has been studied for decades, it has not been applied for large-scale disposal of PCBs.

We have developed a method for the complete decomposition of PCBs using a combination of photodechlorination and microbial degradation. To demonstrate the practical use of this combined method, we examined a pilot scale study on the decomposition of commercially used PCBs from a high voltage transformer for electric cars. After optimizing the culture conditions, we could degrade 99.9975% and 99.99992% of 50 g of Kaneclor 1000 and 100 g of Kaneclor 500 within 9 days, respectively. Mass balance study showed that undesirable by-products such as polymerized PCBs were not produced. Dioxins including dibenzofuran and co-planar PCBs in the Kaneclor sample were also degraded completely by UV dechlorination and biodegradation. The concentration of PCBs in the final effluent, less than 3 µg/l, was acceptable by the Japanese standard on wastewater.

Stephen J. Weishar - Cameron-Cole

Evaluating Remedy Effectiveness – An Overview of Pending State Guidance

The Texas Commission on Environmental Quality (TCEQ) will soon have guidance on Evaluating Remedy Effectiveness, which will influence remediation at railroad sites in Texas and is expected to influence remediation in other states. Existing guidance in the industry tends to be 1) general in nature, 2) related only to groundwater, and 3) limited in pass/fail criteria. Regulations require that most cleanups occur within a “reasonable timeframe” and that progress is tracked. The expectation is that railroads will have increased accountability for system performance. The author provides an insider’s update from the stakeholder group that is creating the draft guidance document. Further, a sample walk-through of the guidance at a hypothetical railroad site will be provided.

The initial steps in effectiveness evaluation are at the Remedial Action Planning (RAP) stage. The draft guidance suggests you identify demonstrations based on the relevant combinations of media (groundwater, soil, sediment) and remedy-type (decontamination, removal, and control). Then, the guidance will suggest you choose preferred methods for evaluating each demonstration type. Each method will have criteria that categorize the results as generally passing or generally failing. A “weight of evidence” approach then will be used to judge the overall effectiveness from the various method results. The critical challenge is balancing the costs of obtaining and evaluating site and system information with the benefit of using the information to improve remedy effectiveness.

Draft guidance is expected in the fall of 2003. The final document will be published after receiving final approval from TCEQ’s guidance document steering committee.

Stephen A. Blair and Thomas W. Hensel - AMEC

W. Patrick Harrison - CSX

Defining Reasonable and Cost Effective Monitoring Responsibilities for a Long-Term Environmental Cleanup

Several years of investigation and cleanup activity followed a 1990 derailment near Lewisburg, Tennessee. Approximately, 15,443 gallons of chloroform were accidentally released to a shallow karst aquifer. The affected aquifer discharges to a spring that in turn flows into Big Rock Creek, an adjacent stream. Groundwater near the derailment and the spring discharge was collected and treated for several years. Originally a CERCLA action, the site was entered into the Tennessee Voluntary Oversight and Assistance Program (VOAP) in 1996, as administered by the Tennessee Division of Superfund.

As collection and treatment operations proceeded, it became evident that it was technically impractical to remove residual chloroform DNAPL from the karst system. In the absence of DNAPL removal, chloroform spring concentrations reached asymptotic levels. Modeling showed it would take many more years for residual chloroform concentrations in the spring flow to reach the 0.100-mg/L MCL and the 0.057-mg/L water quality criteria for chloroform. However, site-specific monitoring data and risk evaluations have determined that potential human and environmental exposures to chloroform in Big Rock Creek are acceptable.

Spring flow, rainfall, Big Rock Creek flow, and chloroform sampling data were used to demonstrate the impractical aspects of continuing groundwater collection and treatment. Specifically, the data showed the following:

1. Collection and treatment was not necessary to meet the chloroform 0.057-mg/L water quality criterion at Big Rock Creek;
2. Spring modifications to direct spring flow directly into Big Rock Creek would eliminate an exposure pathway; and,
3. A simple annual monitoring program is sufficient for long-term monitoring needs; and no NPDES permit is required.

Regulatory approval to implement the spring flow modifications and the annual monitoring requirements was granted. The project remains in the VOAP to meet monitoring requirements. Following modifications and an initial quarterly monitoring period, future annual costs will be reduced from the previous \$50,000 per year for collection and treatment O&M to \$2,000 per year for annual monitoring and reporting.

Risk and Liability Management

Chuck Cline and Steve Wright - Marshall Miller

Tiffany Shaw - Norfolk Southern

Guiding Corrective Action Through The Appropriate Regulatory Framework

Over the past decade, the environmental industry has evolved tremendously, especially with regard to regulatory programs. Today, responsible parties often have flexibility in choosing or guiding a site toward the appropriate program.

Environmental consultants assisting the assessment and remediation of industrial sites will best serve their clients by investing significant time and effort upfront to investigate programs and even funding sources that may be available. MM&A, while initiating the assessment of a rail yard fueling facility in the state of Alabama, pursued and successfully entered the Selma Rail Yard site in the Alabama Tank Trust Fund for Aboveground Storage Tanks (ASTs). The Selma Rail Yard former fueling facility consisted of a 104,400-gallon above ground diesel storage tank, underground and aboveground distribution piping, a fueling and lube oil rack with concrete aprons, drip pans, and oil/water separator. Entrance in the Trust Fund required additional upfront costs to investigate eligibility and register temporarily closed ASTs, but resulted in substantial savings to the client, whereby all fueling facility remedial actions will be paid by the trust fund.

Taking time to conduct the initial, appropriate due diligence steps to investigate and select the most appropriate regulatory program and, in some cases, fund eligibility, for the assessment and remediation of industrial sites will often pay dividends for responsible parties in the new era of risk-based approaches to remediation.

Jeffrey A. Gilman and Katherine Super - MFG

James A. Levy - Union Pacific Railroad

Risk Management Plan for Redevelopment of Former Union Pacific Railroad Lenzen Yard in San Jose, California

A Risk Management Plan (RMP) for the inactive Lenzen Rail Yard in San Jose, CA was prepared to manage residual environmental risks and to integrate risk management with construction activities required to redevelop the property. UPRR sold the Lenzen Yard in October 2000 to a commuter railroad that is proposing to use the property for a railroad maintenance facility. The terms of that sale provided UPRR with the lead role (and opportunity) for coordinating with the California Regional Water Quality Control Board (RWQCB) regarding residual chemicals and petroleum in soil and groundwater. The primary purpose of the RMP (formally approved by the RWQCB) was two-fold. First, the RMP evaluated potential human-health risks to construction workers during redevelopment of the property and prescribed protective measures, as necessary, based on risk. Second, the RMP provided a management framework that allowed the reuse of impacted soil and groundwater. The regulatory basis for soil reuse is the EPA "Area of Contamination" policy. The RMP included a focused, site-specific risk assessment based on conceptual designs for the maintenance facility. The primary constituents of concern were arsenic in soil and weathered petroleum products in soil and shallow groundwater. The human-health risks were demonstrated to be acceptable for workers involved in soil excavation, grading, dewatering and other construction activities. The permitted reuse of contaminated soil under pavements and other areas will minimize the volume of surplus contaminated materials that are removed from the site during redevelopment, and thereby reduce the cost for restricted disposal of these materials.

Michael M. Meloy and Marc E. Gold - Manko, Gold, Katcher & Fox
2002 Brownfields Amendments to Superfund - Teaching an Old Dog New Tricks

Over the past twenty years, the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”) has served as the principal federal source of authority to compel the investigation and remediation of releases or potential releases of hazardous substances. The sweeping scope of the liability framework under CERCLA has been a key factor in structuring transactions and shaping cleanup activities.

In early 2002, the Small Business Liability Relief and Brownfields Revitalization Act was signed into law. This piece of legislation, commonly referred to as the Brownfields Amendments, amended CERCLA in variety of important ways. The Brownfields Amendments represent the most significant changes to CERCLA since 1986.

Under the Brownfields Amendments, Congress added a series of defenses and liability limitations to CERCLA including a contiguous property exemption, a bona fide purchaser exemption, and limited bar on federal actions under CERCLA at sites addressed under state brownfield programs. These changes to CERCLA are vitally important to the railroad industry. As owners and operators of significant amounts of linear property, the risks to railroads of contamination from activities on neighboring properties is substantial. The contiguous property defense affords railroads with a direct mechanism to limit their potential liabilities in such circumstances. In addition, other components of the Brownfields Amendments may well help facilitate the ability of railroads to transfer property to third parties, redevelop potentially impacted property and limit federal liability in circumstances where remediation activities are being undertaken in accordance with state law.

The presentation will be designed to place the Brownfields Amendments in the broader context of the liability framework under CERCLA, to provide an overview of the aspects of the Brownfields Amendments of most relevance to the railroads, and to offer insights into the practical benefits and limitations of the Brownfields Amendments from the perspective of the railroads. In addition to the legislation itself, the presentation will also cover guidance documents that the U.S. Environmental Protection Agency is developing to help amplify on certain policy considerations raised by the legislation.

David E. Cowen—McLeod, Alexander, Powel & Apffel, P.C.
Riaz Ahmed - TRC Environmental
Sharing The Pain of Historical Contamination: An Interdisciplinary Primer on How A Railroad Can Seek Recovery From PRPS And Avoid Legal And Technical Traps Along The Way

American railway companies are one of the largest landowners in the United States. Tenant operations have caused contamination at a number of properties. Environmental regulations brought a huge liability burden due to standards of automatic or strict liability being placed on all owners of contaminated properties. The major railroads carry environmental liabilities in excess of \$500 MM.

Federal and state laws provide railroads with tools to bring third parties to bear responsibility for historical contamination. These laws place a number of requirements on a party looking to others to bear their fair share. A state can require that a railroad give notice to a PRP before the start of any investigation for it to recover cost. The federal statute, CERCLA, mandates substantial compliance with NCP as a prerequisite to cost recovery. Cost recovery claims under CERCLA have often been dismissed because of failure to follow hyper-technical requirements of the NCP, such as its public notice provisions. NCP also requires a higher level of QA/QC. The failure to follow these requirements can result in dismissal of a claim. In some instances, a recovery under CERCLA is not available due to its petroleum exclusion. A railroad must then look to RCRA=s prospective enforcement scheme or to the law of the state where the property is located. However, in some states there are only common law remedies subject to very short time requirements for filing a lawsuit. It becomes paramount that the railroad=s project managers, consultants, and counsel coordinate their respective roles from the onset of any response to a historical or contemporaneous release/spill caused by a third party.

Via actual legal case histories, the paper provides an interdisciplinary approach to this coordination to facilitate a viable cost recovery.

Riaz Ahmed - TRC Environmental

David P. Young, - Union Pacific Railroad
George M. von Stamwitz – AT Environmental
Karl Swanson - A.I.G.

PANEL DISCUSSION: Environmental Risk and Liability Transfer

The four major railroads in their annual reports have reported over \$500 MM worth of non-personal injury environmental liabilities. Many leased sites pose substantially additional environmental liabilities. Real estate transactions also result in railroads having to deal with environmental liabilities associated with historical contamination.

A traditional approach to dealing with this issue has been to hire a consultant and embark upon an uncharted course of remediation with railroads having only a fuzzy vision of the end state of the site and monies needed to reach that end state. Environmental remediation budgets for the major railroads have remained in tens of millions of dollars per year since the advent of RCRA and CERCLA. A significant number of railroad environmental staff have become focused on legacy environmental remediation issues, rather than environmental concerns associated with operational issues on making the trains operate.

In the last few years, there has been considerable talk of transferring the environmental liabilities to third parties leaving railroad employees focused on keeping the trains in operation. Like all new and emerging concepts, there is a great need for clarification and discussion on the pros and cons of these ideas.

This assigned panel will bring four experts from the user and provider communities to discuss their experiences in environmental risk and liability transfer.

The first panel member is David Young. Mr. Young is an attorney in the Law Department of the Union Pacific Railroad. He will bring the railroad's perspectives on environmental liability transfers. His presentation will discuss the desirability of such an approach, the benefits to railroads, and what railroads need to watch for.

The second panel member is Gerry Von Stamwitz. Mr. Von Stamwitz is an attorney and president of AT Environmental LLC. He has experience in environmental and business law, which is crucial in the understanding of the true nature of the liability and in fitting the tool into the settlement of transactions. His presentation will focus on the legal aspects of liability transfers through case studies. His presentation discusses the nature of risks, nature of policy requested, and legal language needed to finalize a transfer.

The third panel member will be a member of a major insurance company offering environmental insurance. His/her presentation will illustrate various insurance policies available, the pros and cons of various policies available, and insurance industry's perspective on insurance instruments available for mitigating environmental exposures and risks.

The fourth panel member will be Mike Salmon. Mr. Salmon is a Senior Vice President at TRC. TRC has successfully completed total environmental liability transfer projects at over 50 sites. His presentation will review representative sites ranging from small compressor stations to major manufacturing factories to superfund sites.

The panel will be managed as an interactive mode to enhance attendance participation.