



**DATE:**  
February 2011

**LOCATION:**  
USA

**OBJECTIVE:**  
MRA used to prevent  
materials from building up  
in rail cars and eliminate  
carryback

Untreated (left) vs. MRA™ treated (right) rail cars



In February of 2011 GBC performed a demonstration of its MRA™ product at one of the northernmost coal handling facilities in the United States. The project involved GBC personnel, GBC's local distributor, a railroad hauling coal and the mine from which the coal originated.

The demonstration train arrived in the evening, sat overnight in below +20F temperatures and was unloaded at first light the next morning. On the morning of the application, the temperature was +15F and clear. Significant effort was exerted to make the rail cars as clean as possible and they were sprayed with approximately 2.5 gallons of MRA™ each.

During the demonstration, mine personnel noted that significant build-up was occurring in the hoppers into which the rail cars unload, causing them to plug up and require manual cleaning. A small amount of MRA™ was sprayed inside of the hoppers using a simple hand pump applicator and immediately the hoppers began flowing smoothly, without coal hanging up in the corners and saved the downtime that results from continuously stopping the belts to clean the hoppers.

MRA™ was applied only once to the rail cars and the train was observed at its next two unloadings.

**The first unloading was observed and videotaped, showing that the vibrator was used for only 12-20 seconds before the entire load was cleanly released. In contrast, untreated cars were vibrated for between 45-120 seconds and none of them fully released. In fact, several untreated cars showed 10 tons or more of carryback.**

Mine personnel who were present for the second unloading of the same train reported **there were noticeable differences in the ease of dumping in the cars that had the MRA™ product applied to them**



In summarizing the results of this trial, the mine report noted, “Applying a release agent to the cars is a fairly inexpensive way to reduce train dumping times, which will result in lower terminal costs and a more predictable train schedule.”

Quoting from the written report by mine, “The results are a far improvement over the typical 2 minute shaking times and 2--3 tons of residual remaining in the cars. **Direct net labor cost savings are conservatively estimated at about \$5,000 per month assuming two hours are saved on each train.** During extreme cold temperatures, the savings may even be greater. Another important benefit to the time savings is allowing the trains to get dumped in a reasonable amount of time so that they can remain on schedule.”

It should be noted that the MRA™ applied to the hopper below the train dump improved the process so substantially that a supply order was placed for immediate use in that application. The \$5,000 reduction in labor costs quoted above did not take into account the decreased unloading time that will now result from not having to stop and manually clear the hoppers. Further, the estimate is only for labor and does not take into account the many other costs of carryback.

In the past, calcium chloride was used extensively, but due to it’s highly corrosive properties, is seldom used now. SRA products composed of varying combinations of glycerin, glycol, alcohol and water are applied immediately prior to loading and in quantities ranging from a minimum of about **6 gallons up to 15 gallons per car.** In all cases studied, these products had a failure threshold of about +20 F. The MRA™ product is applied at the time of unloading, at a rate of **2.5 gallons per rail car and at every second or third cycle.** Importantly, the product is proven effective in temperatures of -20F and below.

GBC has conducted a number of tests with receivers of coal, including an in depth savings analysis in partnership with a large, multi--state coal burning producer of electricity. The values discussed below regarding the costs of carryback are taken directly from that supplier’s experience.

**COST ANALYSIS/SAVINGS USING MRA™ :**

<b>Product Cost Savings</b>	<b>\$18,008</b>
<b>Reduced Cars/Train Savings</b>	<b>\$60,000</b>
<b>Vibrator Savings</b>	<b>\$4,950</b>
<b>Labor &amp; Overhead Saving</b>	<b>\$426,193</b>
<b>Total Savings per Season</b>	<b>\$509,151</b>

The analysis covered two plants that both received some of their coal from the same mine in deliveries of 6 trains of 130 cars (120 t) per week combined. The traditional SRA in use at the utilities leaves 10% or more carryback in temperatures of +20F and below. The SRA also must be applied prior to each loading and in quantities as high as 15 gallons per rail car.