

# EEPI CASE STUDY

## Executive Summary

The test was carried out on 4 General Motor EMD GP 38 (2,000 HP) and GP 40 (3,000 HP) with Mach 3 SEFS-HD at half the dosage (of 1 in 2,000, i.e. 500 ppm) for first time use, which should have been 1 in 1,000 (1,000 ppm) by a RailAmerica subsidiary railroad company in San Diego for 4,800 miles traveled in 20 consecutive operational days in the month of August 2007. They saved approximately 2,000 gallons of diesel fuel from their usual monthly average total consumption of 7,500 gallons for an average of 23%  $\pm$  3% fuel savings. They put in a standing order and look forward to the emissions and performance aspect of the product.

## Client Background

RailAmerica, Inc., is based in Florida. They are the largest short line and regional rail service with 42 regional and short line railroads. RailAmerica conducts their business in 25 states and three Canadian Provinces and they are acquiring new short line railways yearly. RailAmerica operates approximately 7800 miles of route miles to date. Their primary shipments are of coal, lumber and forest products.

In May of 07' RailAmerica announced that they were "going green." The company has seen that reducing their cost while lowering emissions is just good business, yet at the same time they are VERY aware of becoming environmentally eco-friendly company.

RailAmerica is a first class company that prides itself in being the finest in their field. Not only are they striving to become eco-friendly they have also just received the coveted Silver E H Harriman award for impeccable safety record in 2006 for one of the railways that they operate.

## Client Report

October 10, 2007

Dr. Dennis Leung, CEO & President  
Mach 3 Technologies Group, LLC



Dear Dr. Leung,

San Diego & Imperial Valley Railroad was pleased to test Mach 3 SEFS-HD ecological fuel additive product throughout the month of August on four of our locomotives, namely 2 General Motors' EMD GP 38 of 2,000 HP and 2 GP 40 of 3,000 HP operating from our San Diego depot. The results of the tests far exceeded our expectations. We recorded a diesel fuel savings in the range of 23%+3% over a 20-day operational period on all these four locomotives.

San Diego & Imperial Valley Railroad has two diesel fuel tanks, each one holding 10,000 gallons. We typically use approximately 7,500 gallons per month for the operation of our locomotives. Five gallons of your Mach 3 SEFS-HD were added to each fuel tank in the ratio of 1 to 2,000 (500 ppm) before pumping the blended diesel into each of the locomotives. Despite the recommended dosage for the first time use (of 1 to 1,000) that would require adding two 5-gallon pails of Mach 3 SEFS-HD to each tank while we only had 2 pails, we decided to add only one 5-gallon pail of the additive into each tank to run the test on all four locomotives for an even average.

The test process consisted of operating these four locomotives regularly for 20 days between August 2nd and August 31st 2007. Each locomotive did a round trip of 60 miles per day up hill and down hill between San Diego and San Ysidro for a total traveled distance of 4,800 miles with 5,500 gallons of diesel fuel consumed. Prior to August and without your Mach 3 additive, the average monthly fuel consumption was 7,500 gallons. In August and with Mach 3 SEFS-HD, the fuel consumption was down to 5,500 gallons.

The details of the test results were as shown in Table 1 below:

	<b>Pre-Mach 3</b>	<b>Post-Mach 3</b>	<b>Monthly Change</b>	<b>Annual Change</b>
Fuel Consumption ( <i>Gallons</i> )	7,500	5,500	2,000	24,000
MPG ( <i>4,800 miles total</i> )	0.64	0.87		
Fuel Costs ( <i>\$2.50 per Gallon</i> )	\$18,750	\$13,750	\$5,000	\$60,000

*Table 1: Mach 3 SEFS-HD Test Results in 2 EMD GP 38 and 2 GP 40 Locomotives 08/02/07 to 08/31/07*

The monthly and consequently the annual fuel savings of 23%+3% average by using Mach 3 SEFS-HD for the San Diego depot are statistically as well as financially sig-

nificant. Annual savings to RailAmerica at this one depot alone are estimated to be approximately \$60,000 which would add up to tens of millions of dollars overall that will flow straight to the bottom line. Our engineers operating the locomotives also reported that the engines ran much smoother and cleaner with Mach 3. We shall be looking forward to substantial additional fuel savings, cleaner emissions and longer maintenance intervals that can be realized with Mach 3 SEFS-HD blended in the diesel fuel for all our locomotives and other diesel engines in our system.

As a result of the success achieved in the above fuel consumption test, San Diego & Imperial Valley Railroad has agreed to expand it to a wider range of testing objectives with more locomotives in varying environments involved. These series of tests shall be managed by RailAmerica's Chief Mechanical Officer for the Western Region. It is planned to conduct these tests over the next 3 to 6 months in a controlled environment to precisely evaluate the benefits to our locomotives for a lower operating temperature at a higher efficiency, longer maintenance intervals, improved ecology and fuel economy. San Diego & Imperial Valley Railroad, a RailAmerica subsidiary, is an environmentally sensitive and conscious corporate body will be happy to work closely with Mach 3 Technologies Group to establish a capability to test and to reduce the emissions from the locomotives for a cleaner environment. We are keen to analyze and hence to achieve the optimum in fuel economy and ecology based upon your knowledge and experience that you have acquired in other Mach 3 applications and testing environments.

We are pleased with the results of the tests and look forward to working with you in our further testing in the coming months with pleasure.

Sincerely,

Pete Jespersen  
General Manager

Cc: *William Wu*  
*President ChinaOil (USA), Inc.*

### **Conclusion**

The RailAmerica testing yielded positive results in a number of important ways. The 22 day fuel efficiency test produced a 23% fuel efficiency gain. Operators noticed less visible emissions. Additionally they commented that their engines ran cooler and they experienced more power in the engines. They have placed a standing order and they will continue to closely monitor and test further performance and lower emissions results.

#### Contact Info:

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