



Environmental Initiatives

Environmental Program
Locomotive Retrofit Grant
Locomotive Servicing Program

Environmental Projects

2

- Eco-Tip Super-Stack Fuel Injectors
 - November 2005
 - 3% fuel savings at full load
 - 4% reduction in particulate matter
 - 75% reduction in smoke opacity
- Ultra Low Sulfur Diesel
 - Converted June 2006
- Puget Sound Diesel Emissions Inventory
- Puget Sound Ports Diesel Retrofit
 - Port of Tacoma
 - Port of Seattle
 - PSCAA
 - Puget Sound Maritime Air Forum



Environmental Projects

3

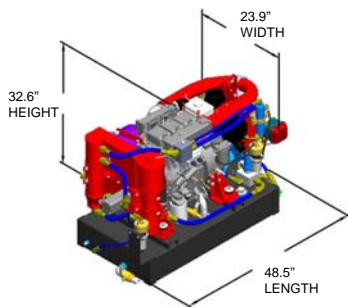


- Baseline Climate Change Project
- Idle Reduction
 - Up to 3 gallons/hour fuel savings
 - 70 hours/week per locomotive
 - \$2.70/gallon = \$567/week savings per locomotive
 - Currently a manual operation in summer
 - Savings of 5,000 gallons/month

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Idle Reduction - Kim Hotstart

4



- Diesel Driven Heating System (DDHS)
- Allows an idling locomotive to be shut-down by:
 - Heating the Coolant & Oil
 - Charging the Batteries
 - Powering Cab Heaters
- Collaboration
 - WSDoE
 - ORCAA
 - PSCAA

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Idle Reduction – ZTR Smart Start

5



- SmartStart has demonstrated a proven effectiveness for automatically managing locomotive shutdown policies and slashing fuel costs and emissions
- Every hour of locomotive idling results in wasted fuel, needless engine wear, oil consumption, and undesirable emissions
- SmartStart features a built-in performance-tracking feature that precisely records and calculates all system activity

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Idle Reduction Statistics From ZTR

6

- Fuel Savings
 - Locomotives spend much of their time in idle – typically more than 3600 hours per year. By reducing the time the engine runs during idle an incredible amount of fuel can be saved.
 - 3600 hours x 50% (assumed reduction in idle time) = 1800 hours of idle operation eliminated
 - 1800 hours x 3 to 4 gallons of fuel per hour burned in idle = 5400 to 7200 gallons of fuel saved per year
- Emissions Reductions
 - Locomotives spend much of their time in idle. By reducing the time the locomotives spend in idle with their engines running, exhaust emissions can be reduced.
 - For mainline locomotives, idle operation is responsible for approximately 3% of total exhaust emissions. These emissions can be reduced by 50% or more!
 - For switcher locomotives, idle operation is responsible for approximately 14% of total exhaust emissions. Again, these emissions can be reduced by 50% or more!

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Mainline Locomotive Servicing Program

7



- Locomotive Servicing
 - Fueling
 - Sanding
 - Cleaning Cabs
- Locomotive Positioning
 - Locomotive Consists
 - Tonnage
 - Power Balancing
- Employment Partnerships
 - Bates Technical College
 - Future Sources
 - Apprenticeship Programs

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UP Locomotive Servicing Program – Savings

8

- Looking at The Savings
 - 4 to 6 hours per locomotive over the alternative trip to Seattle for service
 - This 4 to 6 hours equates to from a minimum of 20 gallons to a maximum of 120 gallons of fuel savings for each locomotive
 - All fuel is USLD which might not have been the case otherwise
 - One full day of locomotive availability for each four unit train set serviced!

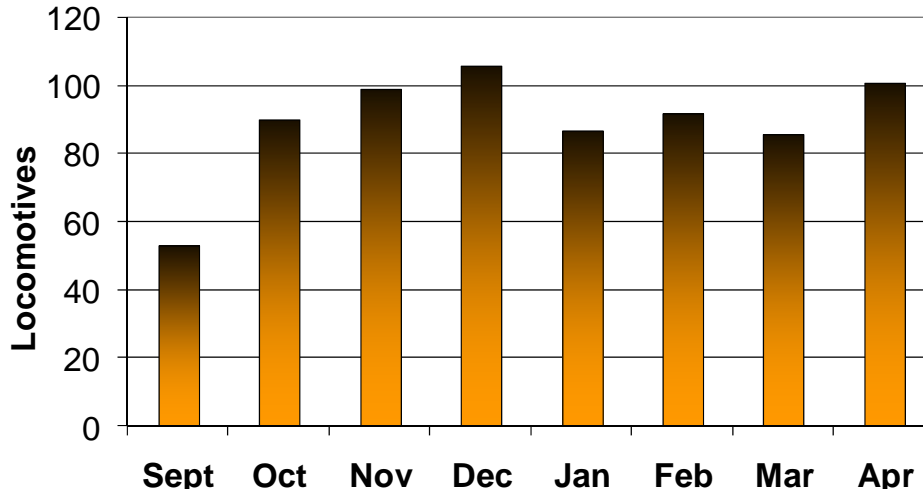


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UP Locomotive Servicing Program

9

UP Locomotives - Serviced



UP Locomotive Servicing Program - Fuel

10

UP Locomotives - Gallons of Fuel

