Innovation in Railroad Locomotive Fueling

Canadian Rail Summit

May 12, 2016

MPL Innovations, Inc.

SPILLX.

Locomotive Fueling Interface
Recommended Practice 5503 (2001)

Comparison of SpillX to the Locomotive Fueling Interface Recommended Pratice RP-5503 *Adopted 2001*		
	RP-5503	**SpillX**
600 GPM Flow Rate	✓	✓
Auto Shutoff	✓	✓
Overfill Protection	✓	✓
Dry Break Connections	✓	✓
Gradual Shut Off	✓	✓
Less than 5cc Upon Disconnect	✓	✓
Nozzle Weight Less than 10 lbs.	✓	✓
Positive Lock Nozzle	✓	✓
Installs in Less than 15 Minutes		✓
Requires Electrical Power	✓	
Requires Wayside Controller	✓	

The SpillX System

- SpillX has leveraged the expertise of various organizations in the development and testing of the system

- Utilizes aviation industry single point dry break nozzle installed on fuel crane
- Enables significantly higher fueling rates with no modifications to infrastructure flow to flow optimization through the nozzle and locomotive components

The SpillX Components

The SpillX nozzle attaches to the fuel crane or DTL truck

The SpillX receiver is installed in the fill tube of the locomotive. A spring loaded poppet provides a “closed” system

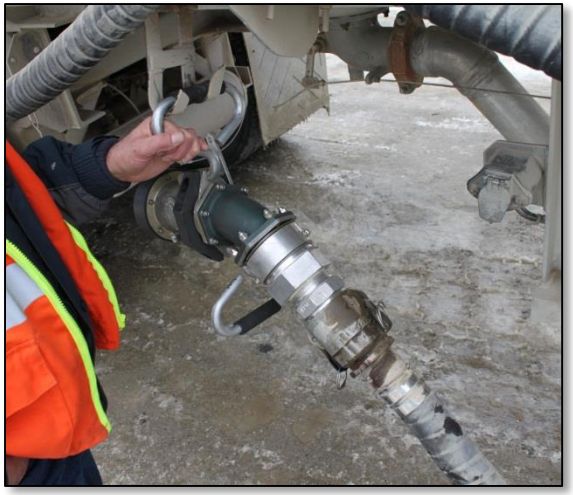
The SpillX jet level sensor is installed into the existing vent port

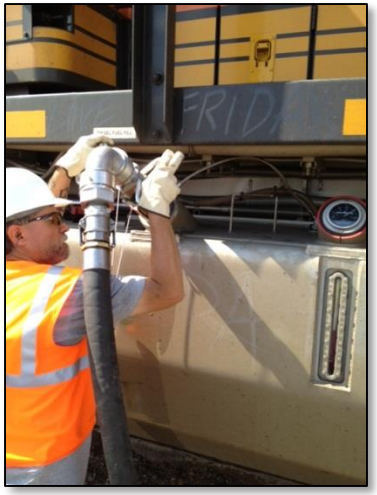
Installation of SpillX - Locomotive

- Designed to be a direct replacement for existing North American system
- No modifications to the locomotive required
- Simply unscrew old components and screw in SpillX
- Installation takes less than 15 minutes per fill port

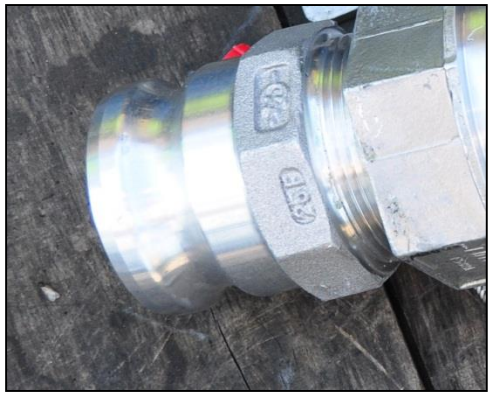
Installation of SpillX Nozzle

- Designed to be a direct replacement for existing system – using standard threaded quick disconnect fittings
- Simply remove the existing nozzle using cam locks and replace with SpillX nozzle
- Installation takes less than 5 minutes





How SpillX Operates



• The SpillX nozzle connects to the fuel hose using a simple 2.5” cam lock mechanism (picture right)

• The SpillX receiver is installed in the fill port of the locomotive – GE or EMD

• The SpillX jet level is installed “vent tube” port in the top of the tank near the fill port

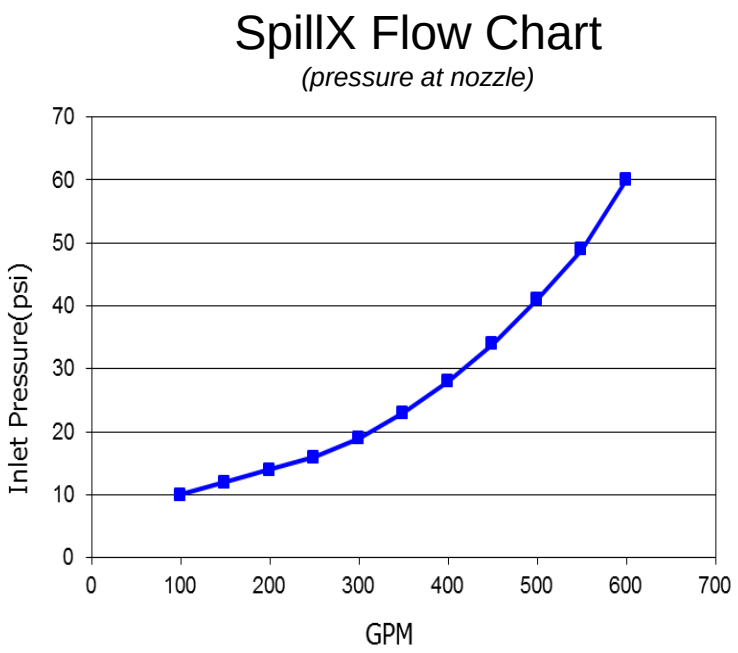
• Once the nozzle has been attached to the locomotive, the valve is opened and fuel begins to flow into the locomotive. When full, the jet level senses the level of fuel in the tank and causes the receiver to stop the flow of fuel.

• The nozzle valve is then closed and removed from the locomotive

• Demonstration Video www.spillx.com

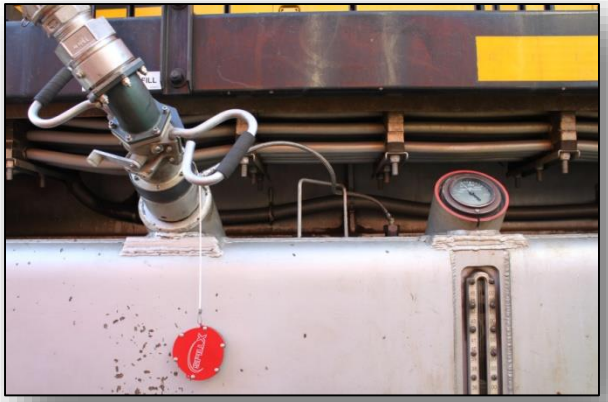
Benefits of SpillX

- Increased fueling capacity with no infrastructure modification
- Ability to significantly reduce DTL fueling times with truck modifications
- Internal shutoff mechanism ensures system cannot be overfilled
- The dry break system prevents fuel theft and foreign objects being placed into tanks
- Reduces leakage and spillage



Durability

- Product cycled 3,500 without failure
  Equivalent to fueling each day using the same port for 350 days/yr x 10 yrs
- Completed vibration testing as per AAR Standard S-5702
- Test field installations have occurred at:
  - Pacific Harbor Line – Los Angeles, CA
  - BNSF – Commerce, CA & Clovis, NM
    - *Ongoing Testing planned at Belen, NM*
  - UP – Colton, CA & Roseville, CA
  - CN – Memphis, TN & Winnipeg, MB
  - CP - Moose Jaw, SK & Golden, BC
  - PWRR – Worcester, MA
  - Ottawa Valley Railway – North Bay, ON



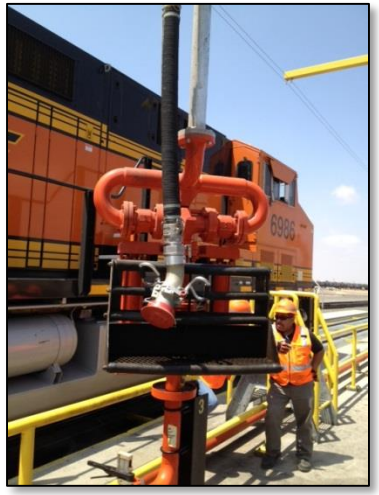
Testing Results

CP Moose Jaw, SK

CP - Moose Jaw, SK Testing		
	PSI *	Flow Rate (GPM)
Current System	55	210
SpillX	45	380
	55	395
	60	435
** PSI measured in pump house*		

BNSF Clovis, NM

BNSF - Clovis, NM Testing		
	PSI *	Flow Rate (GPM)
Current System	62	243
	90	293
SpillX	54	534
	73	600
** PSI measured at nozzle*		



Conclusion

- SpillX is based on a modified version of proven aircraft fueling technology
- Dry break connections ensure safer fueling
- Safety features designed to reduce the possibly of accidental spills
- SpillX is capable of flowing at higher flow rates than current system with no modifications or infrastructure upgrades to reduce dwell times at critical fueling locations

MPL Innovations, Inc.

SPILLX.