IS YOUR DIESEL READY FOR WINTER??

It is once again time to prepare for winter operations and implementing diesel equipment & fuel storage tank maintenance.

LAST YEAR from Dec 26-Jan 7, 2018 was one of the most challenging - constantly sub freezing two week stretches that Pennsylvania & surrounding areas have dealt with in a very long time. Today's diesel fuel demands constant -year round attention in order to help prevent the fuel gelling/icing issues that way too many experienced last year throughout Pennsylvania. Fuel suppliers and experts evaluated many different complaints that occurred throughout the Mid-state during this cold snap which is summarized below. The sudden and extended extreme cold weather caught most off guard and unprepared, which created a tsunami of sorts that was difficult for many to recover from quickly. We are here to try to help prevent recurrence of these issues. We have many customers that had successful operations during this cold snap. They are diligent and understand that diesel fuel and fuel storage tank maintenance is a year round process and as important as maintaining their equipment. We want to help everyone be successful, minimize down time and dramatically reduce overall costs. Read on to understand.

WHAT ACTUALLY HAPPENED LAST YEAR?

EXTREME COLD WEATHER - DIESEL FUEL RELATED FINDINGS 2018:

1. **Atypical Weather patterns** compared to previous 5 years.

2. **Extended sub freezing "cold soak" temperatures** created significant wax formation in fuel storage systems, even above the fuels cloud point, otherwise known as the "wax dissolution temperature." Temperatures in areas of PA remained constantly below freezing 32 degrees F from 12/26/17 thru 1/9/2018. That's 15 days without allowing the fuel to recover above freezing, causing excessive wax to fall out of solution.

3. Due to the extended length of sub freezing temperatures, **wax** that had already come out of the fuel **was not able to re-energize** in order to re-dissolve back into the fuel for extended periods of time. This created additional wax formation within the same fuel, making the issue worse. Any water in the fuel can form ice crystals below 32°F. These ice crystals bind with the natural paraffin wax in the fuel and begin to pull the wax molecules out of suspension, causing an icing & gelling situation. In normal circumstances, this is usually the case where water / icing are the main issue.

4. Many customers experienced **fuel storage dispensing tank filter plugging** due to wax formation & ice crystal formation at the bottom of the fuel storage tanks. It then enters the fill tubes as fuel is siphoned up and into the fuel filter = clogged filters and possibly causing end user equipment failure due to gelled fuel. Some storage tanks gelled throughout the tank due to inadequate amounts of wax modifying fuel additives and / or excessive water in the fuel, either emulsified water trapped in suspension or heavy bottom water. Poor quality fuel and improper tank maintenance likely lead to this scenario.

5. Due to the **complex nature of blending** and manufacturing diesel fuels, some Northeast US Refiners & Fuel Suppliers were selling fuel that had a higher cloud point than normal for this region of the USA. This fuel unknowingly required elevated quantities of cold flow improvers in order to achieve Cold Filter Plug Point (CFPP) targets. Also it was found that some of the fuels in the region contained higher n-paraffin "heavy wax" which carry atypical high amounts of heavy wax = “hard to treat fuels” as compared to typical "easy to treat" fuels which respond better to cold flow improvers under typical winter conditions.

6. Filtration issues- clogged fuel filter complaints have increased dramatically due to a combination of increased contaminants and tighter filtration requirements. Tighter tolerances and smaller micron filters are needed for newer high pressure common rail (HPCR) fuel injection systems. Smaller micron filters will clog with ice crystals, dirt sediment and wax much quicker than customers are used to with legacy-older mechanical style engines. Diesel owners must adjust and become educated on the newer and much stricter requirements that the HPCR fuel systems demand. **Today’s fuel is not “common rail” friendly.** It is up to the end user to protect the equipment from the unfortunate increased amounts of water and contaminants that can and are being introduced throughout the entire fueling process.

It is important to note that in the past most OEM manufacturers used to frown on the use of diesel fuel additives, yet now they see that good quality fuel additives indeed do play a vital role in improving the quality of the fuel in order to help meet the requirements of the newer HPCR engines. **OEM’s do NOT take responsibility for warranties caused by fuel contamination.**

The demand for cleaner, uncontaminated fuel is essential for today's diesel engines. Bulk fuel storage tank “filtration” should be treated equally as important as end user equipment filtration. (EXAMPLE: using a 30 micron, particulate filter without water absorbing capabilities in a bulk storage fuel tank allows water and contaminants to enter an engine with a common rail fuel system with 10 and 2 micron filters.) This leads to almost immediate contamination potential in the HPCR engine. ONE MICRON IS 40 millionths of an inch, SMALLER THAN A HUMAN HAIR at .004µm.

The #1 cause of FAILURE of Today's High Pressure Common Rail fuel systems is due to fuel contamination.

Variety of High Pressure Common Rail Injection Pump & Injectors

Black – Clogged Fuel Filter

High Pressure Common Rail Fuel System

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IN-FIELD EXPERIENCES & FINDINGS DURING THE COLD SNAP

EXTREME COLD CONDITIONS & FINDINGS ON THE END USER LEVEL:

Bulk fuel storage tank icing & gelling, (especially above ground tanks) creating the inability to pump fuel out of tank. Individual equipment failures due to gelled diesel fuel.

CAUSES: 1. **Not enough, poor quality or NO wax modifying (anti-gel, anti-icing) fuel additives used.** Normal recommended fuel treatment ratios needed to be increased in order to continue to keep the wax distribution flowing throughout the fuel due to the extensive duration of the cold soak period. Anti-gel additive demand "skyrocketed" during this 2 week period, which indicates that MANY, MANY, MANY were unprepared for what occurred. Year Round prep is #1.

2. **Poor fuel storage tank maintenance** allowing water, sludge and sediment to accumulate in the bottom of the tanks, causing a fuel contamination issue topped with extreme cold weather conditions. Contaminated fuel / water / sediment mixture creates an icing / gelling situation which becomes progressively worse as temperatures remain below the fuels CFPP (cold filter plug point.) Once this occurs, it is difficult to control until temperatures return above freezing.

3. **Harder to treat, poor quality diesel fuel** received from the pipeline/refiners with higher n-paraffin wax, higher cloud points and increased fuel gelling in areas of the state.

4. **Fuel treatment added TOO LATE** for the extreme conditions. NOTE: ONCE FUEL HAS REACHED IT's CLOUD POINT, all anti-gel additives are less effective to properly bind with the fuel molecules until the fuel has risen above the cloud point again. Additives should be used "year round" and winter additives should be added with EVERY fill from October 1ST through March 31ST in East Coast Regions to help ensure continuous protection.

5. **TOO much anti-gel additives used**. Thinking: "If a little works, a lot more should help better." NOPE! This causes a saturation point where the anti-gel additive can no longer effectively bind with the fuel until more fuel is added. Typically a maximum treatment ratio is 1 gal: 375 gal for a fuel additive with a standard treatment ratio of 1:1,000. Bottles with recommended treatment ratios of 32 oz: 250 gallons maximum dosage would be 32 oz.: 75 gal.

6. **TOO many "chiefs in the kitchen"** - Shift changes, various employees responsible for running the same pieces of equipment over a 24 hour shift can create excessive or repeated maintenance steps OR totally missed steps. Keep track of what has been done daily.

7. **"Snowball Effect" -** This is caused when one piece of equipment fails, then it's discussed with someone else with a different failure and so on and so on, creating a "seemingly catastrophic" event, when actually in hind sight it was (i.e.: 3 pieces of equipment out of 25) that really had issues. **EACH situation is unique to itself** and must be treated individually, then move onto the next. Looking back, there are answers and reasons for every fuel gelling, storage tank pump failures, equipment failures, etc. DO NOT BUNCH all the problems together, it only leads to finger pointing and longer down time.

8. Emergency fuel thawing additives such as FPPF Meltdown, Innospec Red Alert, have proven useful when added to the fuel in cold temperatures along with the anti-gel additive. NOTE: These products are alcohol based and should only be used for short periods of time during extreme temperature conditions. IF the fuel has already gelled, these additives should be added directly to the fuel filter and fuel tank and then WAIT at least 20-30 minutes before starting the engine while the additive works its way through the fuel lines. Allow engine to idle several minutes.

9. Past History &/or Penny Pinching – Bulk fuel suppliers and end users were found to have customers and storage tanks with gelled fuel, simply because we have not seen temperatures of this magnitude and historically "standard fuel treatment ratios" were successful in the past. Today's diesel fuel quality does not routinely meet the standards of the past. Today's times are different, engines are much more sophisticated, fuel is difficult to maintain within specifications without constant fuel treatment and proper filtration. Learn from the past and look forward to the future. Yes, it demands more attention, but with our help, it is a very manageable, very cost saving and very time saving learning curve for everyone.

EVERY LOAD OF FUEL IS DIFFERENT…. IS YOUR EQUIPMENT PROTECTED??

MILLER DIESEL, INC. RECOMMENDATIONS:

1. Contact Miller Diesel and ask for our FPPF Fuel Additive Catalog

A. "Winter Maintenance & Additive Recommendation Guide."
B. Year Round Fuel Treatment Plan- Customized to YOUR needs.

2. Bulk fuel storage tank users & bulk fuel resellers ask for our

A. "Fuel Tank Maintenance Guide" (In Ground & Above Ground) Tanks
B. Customized Year Round Fuel Additive Program – specifically for you or your customers needs.
C. Fuel Storage Tank Filtration options - Waterguard Fuel Filters

3. Look forward, not back. The future of diesel engines is HERE. It is now the responsibility of the END USER to ensure equipment protection. Take charge of your investments.

Let us help you create a maintenance program and help prevent unnecessary fuel system failures.

GRAB THE BEST – GRAB FPPF

SPECIAL ADDITION PAGE

BLACK FUEL FILTERS & CONSTANT FILTER CHANGES PRIOR TO ROUTINE "PM" MAINTENANCE - IS NOT NORMAL AND NOT ACCEPTABLE!

BLACK FUEL FILTERS:

(Year Round issue). Rail pressures in HPCR fuel systems are ranging from 5,000 psi to over 29,000-45,000 psi. Tolerances are microscopic and contamination is not tolerated. Due to the extreme psi pressures required for these engines, there is also extreme heat created within the engine. This extreme level of heat can often "cook" the diesel fuel to a more unstable condition. To describe it in Layman's terms; this has created an entirely different level of fuel filtration clogging.

Black fuel, black carbon-soot, sludge, asphaltenes, DPF Regen issues, bacteria, diesel soaps, breakdown of bio-diesel, excessive water creation due to sweating moisture and hot fuel returning to a cool fuel tank are clogging filters, sometimes within a few hours of operation. The cycle repeats and repeats and can often change a diesel fuel that started "within specifications" and create an off-spec fuel. This creates excessive and frequent filter clogging, potential injector, pump or engine failure issue across multiple pieces of equipment with various HPCR & Electronic engines.

Miller Diesel has identified many types of engines that are more susceptible to this situation. Detroit, CAT, Cummins, Mercedes are among the named engines. Class 8 trucks and construction equipment are among the highest reported incidents. **We have** also identified and created **a fuel additive solution** that, when used properly, has been proven to greatly improve or possibly alleviate this ongoing and very expensive- unnecessary situation. **Contact us for details TODAY!**