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To: All ULSD#2 and ULSD#2 with biodiesel customers

Re: Recommended Tank Preventative Maintenance

Attached are two articles. The first article is from Oil Express, and the second article is from REG. This information demonstrates that preventative tank maintenance for ultra low sulfur diesel products is required whether or not you utilize biodiesel in your diesel fuel.

In Illinois, HWRT has had biodiesel blending systems in place for over 5 years. Our B11 blends have offered per gallon savings of \$.1159 (2005), \$.1484 (2006), \$.1697 (2007), \$.1461 (2008), and \$.1152 (2009) versus straight diesel. We have experienced very few problems over this five year span. The majority of the problems prior to late winter/early spring of this year occurred in 2006 with the introduction of ULSD. It was determined that cold flow additives needed to be improved to work with ULSD, and the additive companies did a great job of offering products that worked in 2007 and beyond.

The last week of February 2010 into the middle of March 2010 we did receive a handful of calls regarding filter plugging which impacted about 8 retail locations. We called on our suppliers for help identify the cause of the filter plugging because our B11 with the Power Service additive worked marvelously through the extreme cold just two weeks prior.

The conclusion by our suppliers was that components of the fuel had fallen out over time due to the presence of water. This fall out is then stirred up when deliveries are made into the tank. If the tank has not had sufficient time to settle, the particulates will plug the dispenser filter.

Water is bad news in both 100% petroleum diesel and biodiesel blends. In petroleum diesel, the water is known to cause fall out of drag reducer additives utilized by the pipelines (its in every gallon), conductivity additives, and lubricity additives. While biodiesel blends may eliminate the concern on lubricity additives, they add the potential for monoglycerides to fall out of the product. Once these components fall out of solution, filter plugging will occur.

Key Points

- Water is the enemy. Water occurs more readily in above ground storage tanks due to condensation caused by the fluctuation in day to night temperatures.
- Water may enter under ground tanks from the top, walls, seams, or seals.

- Water paste in biodiesel blends can and will give a false negative. **Bottom samples are a must when monitoring tanks containing biodiesel blends for water.**
- Sulfur is a deterrent for microbial growth, so ULSD has greater potential to have issues than LSD or any other diesel product previously used in this industry. Microbial growth occurs when water is present.
- Sample tank bottom annually.
- Perform maintenance, preferably in the spring or fall, based on the appearance of water/fall out in the tank bottom sample.

Today's car and truck engines utilize extremely small micron filters. In addition, today's fuel, ULSD, is a relatively new product requiring several additives to meet ASTM specifications. For these reasons, we wanted to provide you, our customer, with documentation on how best to perform preventative maintenance. While all ULSD tanks should be tested, biodiesel blends will most likely require tank maintenance sooner than tanks containing 100% petroleum. Fortunately for Illinois retailers, it still makes sense to use B11 as the cost savings far outweigh the cost to perform the maintenance at slightly shortened intervals when compared to 100% petroleum.

Please contact your sales representative if you have any questions regarding this document.

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Sincerely,



Matthew W. Schrimpf
President

Marketers want study of ULSD problems, cite concerns raised by survey results

Marketer groups are pushing for an in-depth study on the effects of ultra-low-sulfur diesel on dispenser and tank systems after a survey showed that 42% of companies handling the fuel have experienced equipment leaks, clogging and corrosion problems.

The survey was organized by the Petroleum Equipment Institute (PEI), a trade group representing equipment manufacturers and distributors, some of whom are now being hit with warranty claims.

Respondents cited problems at nearly 5,000 outlets, including automatic nozzles that don't shut off, seal and gasket deterioration, clogged filters and dispenser leaks, damaged leak detectors and meter failures.

The decision to conduct a survey came out of an industry meeting with EPA in January attended by refiners, marketer groups, and equipment and additive firms. At the end of the EPA meeting, it was decided to conduct a survey to determine if the ULSD trouble was widespread.

If so, the next step was to be a detailed study of the possible causes of the ULSD problems.

But that plan appears to have been jettisoned some time during a day-long meeting of trade groups and private companies at the American Petroleum Institute last week.

In its place, API asked attendees to agree to stick by a statement that declared the survey results to be "inconclusive" on the cause of the equipment failures.

Now, instead of a study, marketers will be given "guidance" on tank maintenance and monitoring via a website maintained by API. In addition, there will be another survey, 10 times longer than the first one, which will be sent out to selected marketers only.

Marketer groups initially agreed to go along with the "inconclusive" verdict but are now having second thoughts about how the meeting was handled and the outcome.

"More time was spent discussing how to control the information and how to present the survey results in a positive light than trying to figure out what is going on with ULSD," says one Oil Express source.

There were 29 attendees at the API meeting – refiners, marketers, truck stop owners, trucking and additive firms – who watched PEI VP Robert Renkes make a PowerPoint presentation on the survey results.

They were also allowed to read 30 pages of comments submitted by survey respondents but were not allowed to make copies of them or remove them from the room in case they ended up on the Internet or in a jobber association bulletin. At the end of the meeting, the papers were collected. PEI cited the need for "confidentiality" of the surveys, although there were no names on the comments.

"It was just all about control," said one source.

Some are also troubled by what happened next. API told the groups that some of the information submitted from survey respondents could be "misleading" if it became public, and therefore it would be best for everyone to give the same account of the meeting if they were asked questions by the press.

An API official then produced a pre-written statement and asked attendees to agree to it. After arguments and changes, the statement was eventually approved by most of the attendees. By then, they had spent seven hours in the API conference room. Copies of the statement were distributed for use in trade group member bulletins and for handling possible press questions.

The statement highlighted the fact that 58% of respondents had found no problems with ULSD – the trouble reported by the other 42% represented only a small fraction of the fuel distribution system. While there was some evidence of accelerated corrosion, the cause "remains unclear," the statement said.

"I can't understand why there was all this need for secrecy," said John Eichberger, government relations VP with the National Assn. of Convenience Stores. "We need to throw all that petty stuff aside. I'm much more concerned about what is causing the problem and how to fix it. We don't want to be dropping stuff in our tanks that make things corrode. The last thing we can afford as an industry is corroding tanks. The fact is that there are reports of tank problems and we need to start focusing on that."

The decision not to do in-depth research worries marketers who fear that retailers will be blamed if some kind of catastrophic problem with ULSD equipment occurs.



Renewable Energy Group Recommendations for Diesel Storage Tank Management

Tank Maintenance:

1. Monitor storage tank bottoms by removing a sample from the bottom and comparing it to the fuel coming out of the dispenser. If the bottom sample is cloudy or has free water in it, the tank is wet. If the dispenser sample is wet or cloudy, the tank bottoms should be cleaned as soon as possible (see Maintenance Item #5 below). The sampling interval will depend on tank history and conditions, but once per month is a convenient starting point.
2. If tanks are known to be wet, wait as long as possible after a fuel drop before dispensing fuel and monitor dispensed fuel closely.
3. Clean tank bottoms every autumn, at a minimum. If this is done just one time per year, wait as long as possible to minimize the chance of additional water getting in during the “wet tank season” from September through November. A convenient guideline is to wait until at least the first freeze before cleaning the tank bottom (see Maintenance Item #5 for cleaning technique). Unless the periodic bottom samples indicate a problem or the dispensed fuel begins to plug dispenser filters or look cloudy, one bottoms cleaning per year might be sufficient.
4. If tanks contain biodiesel blends, do not rely on water paste or conductivity-based water detection devices (e.g., the Veeder-Root pump systems) to indicate the presence of water. There is strong evidence from the field that neither of these is effective with wet biodiesel blends. Instead take bottom samples from the tank and use a visual test (see Maintenance Item #1). This is a good practice even with no biodiesel in the tank.
5. The most cost effective way to clean a storage tank bottom is to drop a hose to the low point of the tank and pump fuel into a secondary container until the fuel being pumped is visibly clear and dry. Let the secondary container sit for several days to allow the free water, particulates, and wettest fuel to sink to the bottom. If the bottom of this secondary container is not disturbed, the dry fuel on top can be drawn off and used without issue (in appropriate ambient temperatures). This approach leaves a very small amount of material to dispose of, minimizing both disposal costs and wasted fuel. Cone-bottomed agricultural tanks are sold in a wide range of sizes and make excellent secondary containers for this purpose; “totes” also work well if tilted slightly toward their bottom outlets.
6. Remember: wet fuel and cold temperature is always a bad combination.

Moisture in Fuel Tanks:

Free water and wet fuel are more dense than dry fuel, so both free water and wet fuel will sink to the bottom of tanks. At room temperature, straight ULSD will not typically hold more than 50 to 100 ppm of water in solution; any water in excess of this will create cloudiness and will eventually fall out of solution to the bottom of the tank. Solubility for water decreases with decreasing temperature, so cold fuel holds less moisture than warm fuel. As a result, drops in fuel temperature increase the chances of having free water in the bottom of a tank.

Aboveground tanks are highly susceptible to condensation from daytime/nighttime temperature fluctuations in the fall when days are warm, nights are cool, and the general temperature trend is downward. Although underground tanks are not as prone to the condensation problem, water can get in either from the top during heavy rains or from tiny leaks in the walls, seams, and seals.



If a tank is ever found to be wet, it will get wet again. Discovering and cleaning out a wet tank bottom does not mean that the tank will then be dry going forward: the opposite is true because the presence of water means that water has found a way into the tank. Although fall can be the worst time for water contamination in the Midwest, tanks here should have the fewest water issues in the middle of winter when humidity is low, the ground is frozen, and rain is unlikely (see Maintenance Item #3).

B20 will hold more water than straight ULSD because biodiesel can hold more water in solution than diesel. At room temperature, a B20 sample could have as much as 400 ppm moisture in solution, but just like with straight ULSD the amount of water that will stay dissolved in a biodiesel blend decreases as the fuel temperature decreases. Minor components in biodiesel such as monoglycerides have a stronger attraction to water than to ULSD, so water in a biodiesel blend tank can pull these molecules out of the fuel and down to the bottom of the tank as a gel-like material. When fresh fuel is dropped into a wet tank it will stir up the tank bottoms and it can take hours or days for the wet material and any particulates to re-settle (see Maintenance Item #2).

Microbial Contamination:

Microbial growth requires free water in a fuel tank because microbes can only live in water. Microbes cannot grow in fuel but they eat fuel, so microbes live in the water at the interface between free water and fuel. If free water is detected in the fuel, biocide treatment should be included as part of the tank bottom cleaning process. For best results, add the biocide at the “shock treatment” rate along with the next delivery after the tank bottom has been cleaned. Tank walls need biocide contact as well, so fill the tank to the maximum level possible when biocide is added. Be sure to add the appropriate amount of biocide for the entire filled tank volume, not just the new fuel volume.

Tank usage:

Light use of an underground fuel tank can actually make water problems worse because the small amount of water that steadily gets into the tank accumulates faster than it can be removed (heavy tank use can delay potential water problems because the water is dispersed by frequent fuel deliveries and then removed continuously as fuel is dispensed). In a light use situation, periodic storage tank bottoms monitoring is even more critical (see Maintenance Item #1) and should absolutely be done before fresh fuel is added to the tank.

If a tank is used heavily and water-related problems “suddenly” appear, this means that the water and/or sediment layer in the bottom of the tank finally has gotten deep enough to begin to be drawn out of the tank outlet. In this situation (a heavily used tank that suddenly develops issues), a sample should be pulled from the bottom of the tank as soon as possible. Remember that water pates and submerged pump water detection systems do not necessarily work with biodiesel blends above B2. The only way to know for certain what is on the bottom of a biodiesel blend tank is to pull a sample from the bottom.

P M A A W E E K L Y REVIEW

April 9, 2010

WR 10-14

ULSD ACCELERATED CORROSION SURVEY COMPLETED

The results are in on a nationwide survey on accelerated corrosion events in tank systems handling ultra-low sulfur diesel fuel (ULSD). The survey, initiated by the Petroleum Equipment Institute (PEI) and promoted by petroleum industry stakeholders including PMAA, was designed to determine the scope of accelerated corrosion events that some tank owners have experienced since the conversion to ULSD fuel was initiated in 2006.

Overall, the survey revealed the majority of respondents experienced no accelerated corrosion events associated with ULSD. In addition, while it is clear accelerated corrosion occurs in some tank systems, the cause of these events remain unclear.

Of the 1,192 respondents to the survey, 58 percent reported no problems associated with the conversion to ULSD. The remaining 42 percent of respondents reported a variety of problems, some pertaining to accelerated corrosion and others with no relation to such events. Respondents who reported problems were geographically dispersed and represent a small fraction of the overall fuel distribution system. By far, the largest problem reported in the 30 pages of survey comments reviewed by industry stakeholders was an increase in clogged filters. However, the majority of these complaints did not report evidence of metallic coffee ground-like particles in filters, an important indicator of accelerated corrosion. Other respondents found evidence of metallic particles in filters and reported accelerated corrosion in tanks, tank equipment, including drop tubes, line leak detection sensors and flow meters as well as deteriorated gaskets and seals. In addition, several respondents blamed ULSD for nozzle malfunctions (failure to turn off) and malfunction of dispenser shear valves. The survey results were inconclusive as to the potential causes of these problems, though water intrusion is likely a key factor.

PMAA will continue to monitor this issue closely. Industry stakeholders are reviewing survey results to determine how to proceed next. In addition, the Clean Diesel Fuel Alliance (CDFA) will develop guidance on monitoring and maintenance of ULSD fuel distribution and dispensing equipment. The CDFA will also explore improved data collection methods in order to gain a better understanding of the nature of the issue. In the meantime, please report any accelerated corrosion events involving ULSD to PMAA Regulatory Counsel Mark S. Morgan at mmorgan@pmaa.org.

FMCSA DELAYS CSA 2010

Yesterday the Federal Motor Carrier Safety Administration (FMCSA) [announced](#) that it will delay the implementation of its Comprehensive Safety Analysis (CSA 2010) initiative until later this year. Full nationwide implementation is not expected until 2011.

The CSA 2010 program, an effort to improve motor fleet safety, replaces the Motor Carrier Safety Status Measurement System, known as SafeStat. FMCSA had originally planned to roll out CSA 2010 this summer but after considerable feedback the agency decided to move the start of the rollout from the summer to the fall of 2010.

Under the new schedule, FMCSA will permit carriers to view performance data from April 12, 2010 to November 30, 2010 at which time FMCSA will begin issuing warning letters and using CSA 2010 scores to target fleets for compliance reviews and extra roadside enforcement.