Is My Stored Diesel Fuel Ready for an Emergency?

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Gregory A. Hagopian
President, FTI

Modern refining processes, due to tighter regulation and economic concerns, are leaving today's distillate fuel more unstable and susceptible to contamination. Studies have concluded that the contamination and degradation process of stored diesel fuel #2 is well underway within 28 days of storage. With the tighter engine tolerances required of engine manufacturers, **"the need for intelligent stored diesel fuel management"** is more critical than ever.

On average, diesel fuel is combusted in an engine within 18 to 24 days from leaving the refinery. Because of this, Oil Companies are not compelled to produce a diesel fuel that is capable of being stored for long term.

Critical facilities spend millions of dollars on emergency power system, engine and generator maintenance to be assured that in the event of an emergency, their facility would have the power they require too continue operation without interruption.

Amazingly, the "life blood" of the entire Emergency Power System (EPS) is neglected. Many owners of stored fuel are either unaware or unconcerned about their fuel's condition. Until a calamity occurs, or they are convinced that such an occurrence is inevitable. Those who store diesel fuel for emergency power, seem satisfied to do nothing about maintaining the fuel's clarity and purity or just to burn off existing fuel willing to risk damage to their equipment and leave sediments in the tank's bottom to contaminate new fuel. This attitude is due, to some degree, to the owners being unaware of the consequences and, to a greater degree, having other demands placed on their maintenance budget.

It isn't a matter of if, it's when. "Fuel contamination is a major cause of premature shutdown for standby engine generator sets, fire pump engines and other diesel engine support functions. Contamination commences as soon as the storage tanks are filled and continues until the fuel is used. As the length of storage period increases, the probability for premature engine shutdown due to either clogged filters, or excessive water entrainment, increases.", Factory Mutual Research Corp.

NFPA 110 refers to diesel fuel "Storage Life", 1.5 to 2 years. The Standard recommends that, **"Tanks should be sized so that the fuel is consumed within the storage life, or provision should be made to replace stale fuel with fresh fuel"** , NFPA 110, A-5-9.1

The above recommendation to the Standard Appendix was written over 15 years ago. Due to the increased demand for distillate fuel, oil companies today are now refining 85% more of a barrel of crude than they were in the early 1980's. The result of the current refining process is lower cetane levels, heavier fuel and poorer stability characteristics, a fuel more susceptible to biological contamination.

It is the responsibility of everyone designing or installing a diesel fuel storage tank to inform their customer, the end user, of the inherent problems associated with long-term storage of diesel fuel. By addressing this issue with the end user, prior to design or installation, you will be confirming to your customer that they are working with an

engineering company, or individual, that is well informed and looking out for their best interest.

There are **four simple steps** that need to be put in place to assure clean fresh fuel for the prime mover:

1. Two (2) fuel samples need to be drawn annually. One from dead bottom for visual inspection for free water and debris. The second sample from the supply line to the prime mover and sent to an accredited laboratory for testing for existing particulate and stability using ASTM Approved Test Methods.
2. A biocide introduced to the fuel, per manufacturer recommendation, will control microbial growth within the diesel fuel storage tank. Care must be taken to select a biocide that is registered with proper Federal and State agencies.
3. There are a variety of chemical additives (treatments) that increase diesel fuel stability, are self-dispersing and do not require costly injection systems for introduction to the stored fuel.
4. Removing water and sediment regularly can be accomplished by filtering of the stored fuel through a series of water separators and media filters. Portable equipment can be contracted or a stand alone, automated filtration system can be permanently installed directly to the diesel fuel storage tank. When installing a permanent system, NFPA Equipment Requirements, Labeled and Listed apply.

A scheduled maintenance program for stored diesel fuel for an EPS is necessary for the proper operation of the system.

"When the lights go out, it's too late to clean your fuel"

References:

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- *Factory Mutual Research Corp., Approval Report 3004057* , Class 6063, Flammable Liquid Equipment Section.