FIVE KEYS TO A SAFER STORAGE SYSTEM

The industry must move forward with changes in order to protect homeowners, technicians, fuel supply companies and the environment. The following five-point program will help the industry reduce the risk posed by leaking storage tanks.

1 INSTALL TANKS INDOORS

Storage tanks that are located outside are the number one problem for the industry. Tanks located outside will collect condensation, in some cases daily, which leads to MIC corrosion. Prior to 1992, oil storage tanks were required to be inside based on the CAN/ULC S602 standard. Back then, we had fewer incidents with tanks failing from corrosion. Keeping the water out was a key component to this success. The new CAN B139 code requires new outside tanks to be either non-metallic or have a double bottom with interstitial monitoring.

2 EQUIP OUTSIDE TANKS WITH TOP OUTLETS ONLY

Due to line breakage, freeze-ups and vandalism some U.S. states have banned the use of bottom or end outlets on tanks located outside. All outlets must come off the top.

If the tank cannot be located in the house, installing it outside should be the last choice. Instead of the fuel line coming off the bottom or end, as has been the standard for years, a single supply line should come off the top of the tank. Note: a dearator will need to be installed inside the home at the burner. Avoid using a two-line system as this promotes condensation in the tank and causes premature filter failure.

3 USE CONTAINMENT DEVICES UNDER INSIDE TANKS

The Fire Marshal's Office of PEI has recommended every inside storage tank be installed over a containment device. It is not just the environmental issues they are concerned about. If a spill or leak from a tank migrates under the heating appliance the fuel is heated above its flash point where a fire can easily occur.

Inside tanks do not corrode as frequently as outside tanks, however they do fail. A containment device is designed to catch pinhole corrosion failures, common overfills, spills, and connection and filter leakage. These devices can be installed under new tanks or retrofitted under existing ones. Audible alarms can be installed on the containment devices in areas where daily traffic is not common providing remote monitoring.

stunning revelations

In March, I conducted a training session for field inspectors from the Technical Standards and Safety Authority (TSSA) in Toronto on the subject of domestic oil storage system failures. Based on the feedback from the inspectors, who were from different areas of Ontario, it was not uncommon for them to respond to a domestic oil system failure at least once per week. In some cases the frequency was higher and this has become a major concern.

4 INSTALL A PERMANENT CONTAINMENT DEVICE UNDER FILTERS AND BURNERS

Some proactive heating oil companies have already started this process. As part of their risk reduction process all home heat accounts are retrofitted with a permanent containment tray under the filter. The fuel today is changing (ULSD and Bio-fuels), thus gasket leaks are becoming more common. Should the filter leak during or after servicing, the tray catches the spill and provides time for a technician to return and tighten the filter or fitting or replace the gasket.

In many cases the filters are located at the burner thus a single tray under the burner can provide protection for both of these areas.

5 ADD CORROSION INHIBITORS

There are a number of additives currently available which can be added on an individual bases. Additives will not eliminate corrosion concerns completely, however in combination with other measures, they will reduce the risk of corrosion failure, bringing the issue to a more manageable level.

Photo: www.bushman.cc

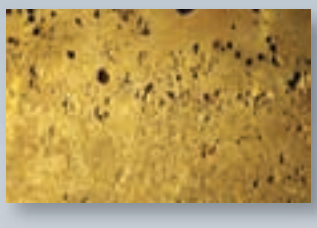
With the current increase in internal corrosion failures it would be prudent to start the process of having corrosion inhibitors added to heating oil at the refinery or distribution level.

Did you know?

In the mid 1950's the use of corrosion inhibitors in heating oil was tested and found to be useful in reducing internal corrosion.

Ultra Low SULPHUR Diesel

It is speculated that the growing problem of internal corrosion failures is due to the changes in the furnace fuel specification, resulting in the reduction of sulphur. Ultra Low Sulphur Diesel (ULSD) is now being used in more domestic home heat storage systems. The effects of ULSD fuel on the storage system have not been fully proven, however there are a number of studies underway to determine what effect if any ULSD is having on the corrosion process. The New England Fuel Institute (NEFI) is currently completing a study on the effect of ULSD on filter plugging and corrosion issues.



Dealing with microbiologically influenced corrosion

The largest source of oil tank failures can be attributed to internal corrosion. Internal corrosion failures are often associated with microbiologically influenced corrosion, or MIC. This aggressive form of corrosion appears in the bottom of steel tanks or filter canisters and is confined to areas where water is present.

MIC is not a new phenomenon, however changes in the fuel sulphur specification, along with the introduction of bio-fuels, has provided a more attractive environment for bacteria to grow in storage tanks. As far back as 1953, studies concluded that water from any source, even a few drops of it, will eat through a tank over time if the water is allowed to stay in one spot.

Data from PEI gives a clear picture of where the industry must focus if it wants to solve this issue. With incidents becoming quite costly events – in some cases costing over one million dollars to clean up – we need to work swiftly to find solutions that work.

Data collected by the Prince Edward Island Department of Environment on domestic oil storage systems provides a better idea where systems are failing. It is certainly not just a tank corrosion issue. We have to look at all types of failures and plot a course that will eliminate all these common events.

PEI HOME HEAT FUEL STORAGE LEAK & SPILL STATISTICS

Based on 2005-2009 Spill & Leak Data for Heating Oil *(PEI Department of Environment)*
Installations: *Inside home – 34080; Outside home – 13920; Total – 48000*

TOTALS: MAJOR & MINOR LEAKS & SPILLS

Year	Inside Tanks[1]	Inside Lines[2]	Inside Overfills	Inside Total	Outside Tanks[1]	Outside Lines[3]	Outside Total	Combined Total
2005	16	44	34	94	37	15	52	146
2006	7	40	44	91	25	16	41	132
2007	15	56	37	108	33	7	40	148
2008	12	36	48	96	23	36	59	155
2009	8	22	57	87	37	15	52	139
TOTALS	58	198	220	476	155	89	244	720
AVERAGE	12	40	44	95	31	18	49	144
Leak Ratio	0.0340%	0.116%	0.129%	0.279%	0.223%	0.128%	0.351%	0.300%
Inverse[4]	2938	861	775	358	449	782	285	333

1. Refers to tank corrosion failures
2. Refers to fuel supply line, filter, connection or burner leakage
3. Refers to outside line or valve breakage
4. Indicates one failure per X households with this storage system — leaks annually. *(One inside steel tank fails per 2938 installations annually)*

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