Retail Station Management Issues for Gasoline Blended with Ethanol

Preparatory Phase

Conversion Phase

First Delivery

On Going Maintenance

This document contains general guidelines based on information from a variety of sources. It is not intended to replace thorough review, careful planning, consideration of site-specific issues, or sound judgment of retail station owners an operators. Mention of tradenames does not imply endorsement. Additional information on materials compatibility, and station preparation is available from a variety of sources, including the Hawaii Department of Health; U.S. Environmental Protection Agency; Petroleum Equipment Institute; Steel Tank Institute; Fiberglass Tank & Pipe Institute; Underwriters Laboratories; Renewable Fuels Association; American Petroleum Insititute; and other associations, agencies and vendors.

See **www.new-fuel.com** for more information.

Ethanol Coming Soon!

April 2, 2006

By April 2, 2006, gasoline in Hawaii will contain 10% ethanol. Ethanol is a common component of modern automotive fuel. All automobile manufacturers approve the use of gasoline containing up to 10% ethanol in vehicles sold in the United States. If gasoline contains no more than 10% ethanol, it is not necessary to refer to it in any other way than "regular gasoline," "midgrade gasoline," or "premium gasoline," based on its octane rating.

In Hawaii, gasoline containing 10% ethanol is exempt from the 4% State excise tax on retail sales.

Gasoline with 10% ethanol has been marketed successfully throughout the U.S. since 1978 and, in 23 states, has been used for over 20 years. Ethanol blenders receive a 5.1 cent per gallon Federal tax credit. In some states (Minnesota, New York, Connecticut, and California), virtually all of the gasoline contains ethanol. Experience elsewhere in the United States has shown that problems can be minimal to nonexistent **if jobbers and dealers pay careful attention** to a few housekeeping details.

A well maintained tank with no water and a final filter used on the dispensing hose can generally be filled with an ethanol blend with no special preparation. A tank containing water **must have the water removed before filling**. Any water problems must be identified and remedied. Once the changeover is made on a sound tank, with proper driveway drainage, and good housekeeping practices, gasoline in your tanks and in your customers' tanks should remain clean and dry.

Please read this Fact Sheet now. To avoid any unnecessary problems for you and your customers, follow the recommendations. Further information is available from the contacts and sources listed and from Hawaii's new fuel web site at www.new-fuel.com.

PREPARATORY PHASE
(prior to program start)

Eliminate Water Entry

Keeping water out of your gasoline storage tanks is important.

Review tanks' history of water accumulation and removal.

If a tank has a history of needing water removal, you must identify and eliminate the conditions that allowed water entry. If 50 gallons of water were mixed with 10,000 gallons of gasoline, it would likely result in nearly 1,000 gallons of off-spec product, hazardous waste disposal costs, and lost revenues while the tank is off-line. These problems can be avoided by eliminating water entry sites. Manholes, spill bucket covers, etc. should be checked for proper water run off and modified if necessary. Water must be kept out of fuel storage tanks, and should **never** be drained into the tank.

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Gasoline Storage Tanks

Since the mid-1980s, 10% ethanol has been used in Underwriters Laboratories (UL) testing of gasoline storage and piping materials. Steel and fiberglass tanks are generally compatible. Warranty statements are available at new-fuel.com. If in doubt, contact the tank manufacturer.

Compatibility of older materials, seals, gaskets, or pumps, or materials (such as PVC piping) not allowed under Federal rules, should be verified and replaced if necessary.

Older tanks may have a build up of sediment. In such cases, cleaning is recommended.

Dispensing Equipment

Equipment such as nozzles, hoses, and meter seals have long been compatible with gasoline ethanol blends and it is unlikely that they would need modification. Very old submersible pumps could require replacement of impellers or seals. Although this is rare, if any doubt exists as to the compatibility of these units, the manufacturer should be consulted.

CONVERSION PHASE

(prior to first delivery of gasoline/ethanol blend)

It is recommended that each retail pump or dispenser be fitted with a 10 micron “water sorb” filter.

Filters listed for use with gasoline-ethanol blends (examples are CIM-TEK Monitor or Petro-Clear Alert) should be obtained prior to delivery of the blend, for installation at first delivery.

Water pastes suitable for use with 10% ethanol blends (examples are Kolor Kut Modified or Sar-Gel) should be obtained prior to first delivery of the blend. Incompatible pastes should be discarded once ethanol blends are in the system, because they would not be able to detect phase separation.

Check to see if tanks have excessive tilt. This may be done by sticking opposite ends of the tank. The end of the tank with the higher stick reading should be where water readings are taken. Be aware that if the tank has a bottom protector (to keep the dip stick from impacting the same spot in the tank), there could be up to 1/4" to 1/2" of water not being read; removal of the protector may improve accuracy of readings.

Before first delivery, test for and remove water bottoms if found.

FIRST DELIVERY

Test for and remove water bottoms if found.

When the initial load arrives, follow normal delivery procedures. Take stick readings and pump readings for an accurate inventory record.

After the initial delivery, it is recommended that operators dispense a few gallons of product through each dispenser to ensure that it is clear and bright.

It is recommended that conversion loads fill tanks to 80% of capacity, and that the tanks be kept as full as possible for the first seven to ten days, to allow the solvent effect of the ethanol to loosen any sediment or varnish type deposits from the sides and upper portions of the tank during a time frame when everyone is aware of the conversion. Check pump flow rates and replace filters if necessary. Some companies may utilize tank bottom samplers to identify any build up of sludge in tank bottoms.

During the first forty-eight hours after delivery, tanks should be tested for water bottoms and/or phase separation once every eight hours using a tank gauge stick and the appropriate water detection paste, even if the unit is equipped with an automatic inventory measurement system and water detector alarms, since these devices are usually not able to detect water levels under ¾”.

Gasoline/ethanol blends will pick up and remove trace levels of water from the system thus eliminating water build up in properly maintained tanks. To catch any new intrusions early, daily water monitoring is recommended.

ONGOING MAINTENANCE

Once through the initial conversion period, there should be no difference in day-to-day operations except for checking for water on a daily basis.

Phase Separation - If proper steps are taken to avoid water, phase separation should not occur. Phase separation is caused by the introduction of excess water into the storage tank (e.g. leaving a fill cap off). The introduction of approximately 0.5% water (50 gallons in a full 10,000 gallon tank) may cause the product to separate into two phases. The upper phase is primarily gasoline. The lower phase, about 70% ethanol, 20% water, and 10% hydrocarbons, is not suitable as fuel. Since product is pumped from the bottom of the tank, it is this mixture that would be pumped to the dispenser. **A final dispenser fuel filter designed to detect and stop phase-separated product from being dispensed to vehicles is highly recommended.**

Since phase separated bottoms contain hydrocarbons, they are generally treated as a hazardous substance. Information on proper disposal of water or phase separated tank bottoms may be obtained from the Hazardous Waste Section, Hawaii State Department of Health, 586-4226 or on-line at www.hawaii.gov/health.

Posting, reproduction, and distribution of this Fact Sheet are encouraged.Please direct comments to mtome@dbedt.hawaii.gov; 587-3809; DBEDT/SID, PO Box 2359, Honolulu, HI 96804.
Thank you!

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