

**California Environmental Protection Agency
Air Resources Board**

September 9, 1996

Mr. Jim Topping
President and CEO
KGO 900 Front Street
San Francisco, California 94111

Dear Mr. Topping:

I am writing in response to your recent television newscast of September 4, 1996 regarding vehicle fires and cleaner-burning gasoline. Attached to this letter is our response to specific comments made in your newscast.

Your newscast inferred that the presence of methyl-tertiary-butyl-ether (MTBE) in cleaner-burning gasoline is responsible for a 10 percent increase in vehicle fires. We have not been able to find any evidence to support this contention. Available evidence indicates that cleaner-burning gasoline with MTBE is not causing any increase in problems, fire or other.

The use of MTBE in gasoline is not new. The United States Environmental Protection Agency (U.S. EPA) approved the use of up to 10 percent MTBE in gasoline in 1981. Based on a submittal by Sun Oil and ARCO Chemical, the U.S. EPA in 1988 approved up to 15 percent MTBE in gasoline. In 1990, ARCO began marketing a cleaner-burning gasoline called EC1 in Southern California with approximately 10 percent MTBE. EC1 was dispensed as a leaded gasoline which meant that only pre-catalyst equipped (pre-1975) vehicles could use the fuel. No problems were reported. Also, beginning November 1992, all gasoline in California in the winter months was oxygenated, mostly with MTBE. Beginning October 1994 all gasoline in Southern California was oxygenated year round in response to a federal requirement. Again, no fire-related problems were reported.

In July, August and September 1996, Air Resources Board staff surveyed a wide range of organizations and various associations including insurance companies, regarding the performance of cleaner-burning gasoline. No problems were identified. This information is attached as part of the response to the specific points raised in your newscast.

I hope this letter and attachment clear up some of the issues regarding our cleaner-burning gasoline program. If you have any additional questions, please call me at (916) ###-####.

Sincerely,

Signed

Michael P. Kenny
Executive Officer

Attachment

Questions and Answers for KGO/TV News Report on September 4, 1996

1. KGO reported a 10 percent increase in car fires for the nine counties in the Bay Area for June and July 1996 compared to June and July 1995. Also, KGO concluded that this increase is occurring in the Bay Area and all over the state. What is happening?

KGO reported it had surveyed more than 70 Bay Area Fire Departments, and found that vehicle fires increased 10 percent in June and July of this year compared to the same time last year. The Oakland Tribune reported on September 4, 1996 that KGO's data showed 1,228 car fires in June/July 1995 and 1,333 in June/July 1996, an 8.5 percent increase. On average, this represents 0.9 more car fires a month in each of the 70 fire departments.

Air Resources Board (ARB) staff's investigation into the issues has not revealed any evidence that cleaner-burning gasoline is resulting in increased vehicle fires.

Two months represents a very limited time frame to compare car fire data between two years. In addition, comparing only two years data can have significant limitations because of natural or other environmental differences or aberrations (e.g., Oakland hills fire) from year to year. Further, with any data set, it is important to isolate and segregate factors that are extraneous to the cause you may be interested in identifying. For example, vehicles fires can be caused by electrical shorts, crashes where fuel tanks become ruptured, and materials being transported that catch fire. None of these examples would be related to the type of gasoline used. Finally, vehicle fires do not occur uniformly with time. To determine an average that is reasonably accurate requires at least a year's data. For two months' data to indicate a trend there would have to be an increase much larger than 10 percent.

The ARB efforts to investigate the issue of increase in vehicle fires are documented in the attached memorandum dated September 5, 1996. No evidence of an increase in vehicle fires due to the introduction of cleaner-burning gasoline was found.

2. What are the requirements of the cleaner-burning gasoline program regarding MTBE?

The ARB regulations generally require that cleaner-burning gasoline contain a minimum level of oxygen. The oxygen makes vehicles run somewhat leaner, and reduces emissions.

A refiner adds oxygen to gasoline by blending in an "oxygenate." There are several oxygenates that can be used, including the ethers methyl-tertiary-butyl-ether (MTBE) and ethanol-tertiary-butyl-ether (ETBE), and ethanol. Refiners choose the oxygenate. To date, MTBE and ethanol have been the most used oxygenates. At present, virtually all California refiners are using MTBE.

Federal reformulated gasoline regulations that apply in most of Southern California and greater Sacramento as well as many areas nationally require the year-round use of oxygenates.

3. Has MTBE been used in gasoline before the introduction of cleaner-burning gasoline this year?

Yes, it has been used extensively in California and elsewhere. As a result of the federal Clean Air Act mandates, all gasoline sold in California since November 1992 during the four winter months has had to contain minimum levels of oxygen, and most refiners have used MTBE. In addition, the federal reformulated gasoline regulations have required that all gasoline sold year-round since January 1995 in most of Southern California and in Sacramento since June 1996 must contain minimum oxygen levels,

usually met with MTBE. These federal requirements also apply in areas outside California with bad air quality--since January 1995 about 30 percent of all the gasoline in the United States has been required to contain oxygen year-round. MTBE was also used in gasoline before 1992, primarily as an octane-enhancer.

4. Is there verifiable evidence of an increase in fuel system problems on gasoline-powered cars and trucks since the introduction of cleaner-burning gasoline this Spring?

The only evidence KGO presented regarding an increase in fuel system problems since the introduction of cleaner-burning gasoline was a statement that the operator of Half-Moon Bay Auto Repair had seen a 25 percent increase in his customers' fuel system problems, and his statement "I think it's the fuel". KGO also showed an interview with the owner of a 1988 Mustang in which he said he had to pay \$1,000 to fix a fuel leak in his engine, and stated that he thought the problem was caused by the fuel.

The ARB staff has been working on an ongoing basis with automotive manufacturers and major parts wholesalers to monitor vehicle fuel system purchases historically and, in particular, over the last six months. Since the statewide implementation of cleaner-burning gasoline in March 1996, we have not noted or been informed of a significant increase in fuel system components purchases or failures statewide. Further, since the winter oxygenates program was introduced in 1992/1993 and Federal Reformulated Gasoline was required in Southern California year-round beginning on January 1, 1995, we have not seen a significant increase in fuel system components purchases or failures due to the use of the same levels of MTBE.

5. Why did Chevron warn customers that cleaner-burning gasoline could cause fuel leaks and engine fires?

Jim Hendon of Chevron (Oakland Tribune article on September 4, 1996) stated that "his company voluntarily issued a consumer warning about the fuel's impact on older cars because during its own testing six of 115 cars burning the new gasoline developed fuel system problems. "We didn't want to alarm our customers and yet felt that they should be fully informed" Hendon said. "It could have been normal wear and tear. We don't know. We were not able to conclude from a chemical analysis why the parts failed."

The Chevron fleet study was designed to complement the larger Performance Subcommittee fleet test program, with the former placing more emphasis on older, higher mileage vehicles. Incorporating the Chevron data into the Performance Subcommittee test program data did not change the overall finding that frequencies of problems for both test and control fleets (3 percent) were about the same, and both test and control vehicles were lower than the baseline failure rate that was found from review of historical fleet repair records.

Evaluation of historical maintenance and repair records for 7,000 fleet vehicles shows an increasing rate of failures in fuel system components associated with aging. The expected frequency of problems determined from this baseline fleet data is 10 percent for equivalent time periods. The problems seen in the historical data are the same types as seen in Chevron's and the Performance Subcommittee's test programs. The Chevron results are consistent with the results of other test programs and review of repair records for vehicles operating on reformulated and conventional gasolines, all of which indicate that older, higher mileage vehicles may have a higher risk of fuel system problems.

6. Does MTBE contribute to elastomer problems or fuel system leaks?

No. There is no indication that the use of MTBE in gasoline blends will affect properties of elastomers other than the swell characteristics of elastometers used in fuel systems, and the effects do not appear to affect the performance of these components. There has been extensive experience in the use of gasoline/MTBE blends. Gasoline/MTBE blends have been marketed throughout the country since the late 1980's with no reported compatibility problems for vehicle fuel systems. Since November 1992, during the winter seasons, the majority of gasolines marketed in California contained MTBE at 11 percent by volume. Since October 1994, almost all gasoline marketed in Southern California has contained MTBE. We are not aware of any reported problems resulting from the extensive use of gasoline/MTBE blends during winter.

The U.S. EPA in 1988 approved the use of MTBE as a gasoline additive in automotive fuels in concentrations of up to 15 percent by volume. The U.S. EPA approval is based on test data submitted by Sun Oil company and others. Sun tested a variety of fuel system materials (e.g., plastics, metals, and elastometers) for both long-term durability and compatibility. Toyota also did testing. The only effect found was an increased swell of elastometers. This increase is within the acceptable ranges according to criteria developed by General Motors (GM) Research Labs. Sun also performed 50,000 mile durability tests and did not find any decrease in durability in performance and materials. Evaporative emissions in tests performed by Sun Oil indicated the absence of leaks for the vehicles run with the MTBE fuels. Based on all of the above data, the U.S. EPA has approved the use of the gasoline/MTBE blends for up to 15 percent by volume in MTBE.

During 1995, GM also performed a series of bench tests on fuel components using MTBE/gasoline blends. GM's conclusions indicate that the fuel system materials including nitriles do not experience any unusual or unexpected performance problems when MTBE blends are used.

7. Were the fuel leaking problems experienced in some 1984-1989 Nissan models caused by MTBE?

The National Highway Traffic Safety Administration's Office of Defects Investigation (ODI) noted an increase in reports of fuel injector assembly leakage and engine compartment fires for 1984-89 Nissan 300 ZX and 1985-88 Maxima vehicles. Specifically, the problem was delineated as "the fuel injector assembly may leak from either the fuel rail interconnecting hoses, the injector hoses, or the injectors." (The article is attached as part of the September 5, 1996 memorandum.)

A key concern with these vehicles was Nissan's use of fuel injector plastic bobbins, constructed with fiber reinforced nylon 6/6 because of accelerated deterioration rates. Statistically, it was noted that these vehicles' rate of car fires was below its peers the first five years, then increased above the peers' rate at six years and over 100,000 miles.

Nissan identified owner maintenance and unforeseen changes in fuel composition as the primary factors for the problems encountered. ODI made no findings regarding the fuel composition/material compatibility issues raised by Nissan. However, ODI noted in its study that the trend in fire incidents for these vehicles appears to be driven by age and not by changes in MTBE usage. Further, that analysis of fire incidents by (individual) states also shows no apparent correlation to areas with mandatory seasonal oxygenated fuels programs. Finally, at present, there is no indication of similar fuel injector leakage patterns in other makes of vehicles.

8. When did automotive manufacturers stop using nitrile fuel system components that are in direct contact with the gasoline?

In the late 1970's, alcohols and ethers were introduced into gasoline, requiring changes in some materials used for seals, hoses, and fuel tanks. Because of this evolution, fuel systems in the early to mid-1980's and later model year vehicles are compatible with oxygenated gasoline including cleaner-burning gasolines. In pre-1980 vehicles, many original components have been replaced with parts that are compatible with oxygenated gasolines. In addition, since 1992, these components have already been exposed to oxygenates including primarily MTBE and ethanol.

9. Are individuals with pre-1985 vehicles buying fuel system components from auto parts dealers and manufacturers that are made of nitrile or viton and do auto mechanics know the differences?

Aftermarket suppliers, for the most part, design fuel system components and engines to be compatible with reformulated gasoline. Consumers should be aware that some aftermarket parts do not adhere to the same design and quality standards as the original equipment manufacturer (OEM). Auto mechanics generally use only OEM parts or part manufacturers with an established reputation for part compatibility and quality. Nitrile elastomers have been used nationally with MTBE fuels for many years, and at levels comparable to cleaner-burning gasoline for the past three years, without a significant increase noted in fuel system component failures. However, vehicle owners should consult with their automotive repair specialist on the types of materials used to replace fuel system components for older, high mileage vehicles and types of elastomers they recommend.