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Category: 37 – Jet Fuel

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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SUBJECT: Applicability of Fuel Storage Regulations to JP-4 Jet Fuel

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THRU: Brock Nicholson, Chief
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The following is in response to recent verbal inquiries from both Region IX and DSSE regarding the OAQPS position on certain technical issues raised in the U.S. Air Force report entitled "JP-4 Vapor Control: Regulatory and Technical Evaluation of Requirements to Control Vapor Emissions From JP-4 Storage and Dispensing Facilities," dated August 1980.

Previously, on March 13, 1981, the Office of Air Quality Planning and Standards (OAQPS) responded to a Region IX request for a final determination regarding the issue of reasonably available control technology (RACT) for JP-4 storage in certain horizontal, underground storage tanks. (See memorandum titled "Applicability of Fuel Storage Regulations to JP-4 Jet Fuel" from Edward F. Tuerk, Acting Assistant Administrator for Air, Noise, and Radiation to Clyde B. Eller, Director, Enforcement Division, Region IX.)

Our memorandum of today is intended to review the previous response as well as respond to the basic question of applicability to regulation of certain types of JP-4 storage employed by the U.S. Air Force.

There are three issues raised in the executive summary of the above referenced Air Force document. The third issue ("Is there RACT for JP-4 stored in horizontal, underground tanks?") was addressed in our memorandum of March 13, 1981. In summary, our response based on information available at that time was: "We recommend the exemption of JP-4 jet fuel (stored in horizontal, underground tanks) from the requirements of applicable storage tank CTGs."

The other two issues are:

<u>Issue 1</u> – Is the U.S. Air Force in violation of air pollution control district rules which prohibit storage of petroleum distillates having a vapor

pressure of more than 1.5 psia in containers of 40,000 gallons or more unless such containers are equipped with special equipment?

Issue 2 — Is the regulation of underground JP-4 storage tanks at U.S. Air Force bases in California within the reasonable purview of the pollution control district rules relating to volatile organic compound (VOC) emissions from petroleum storage facilities?

These two issues can generally be combined as one dealing with the question of whether the control regulations are actually applicable to horizontal, underground JP-4 storage facilities. The Air Force argued that due to the unique storage conditions, the facilities are not subject to regulation. Their rationale in part is as follows: Because of the relatively rapid throughput of JP-4 in the horizontal, underground tanks, the vapors expelled from the tanks are not at equilibrium with the JP-4. Thus, the air is not fully saturated and the true vapor pressure of the vapors vented is less than 1.5 psia.

EPA data indicate that where storage tanks are rapidly emptied, a blanket of vapors of varying thickness at or near saturation will lie directly above the liquid in the bottom of the tank. Measured VOC emissions will typically increase as the tank is filled with petroleum liquid and the level of the fluid rises in the tank. Final emissions from the tank are generally at or near saturation. In addition, the temperature of the petroleum liquid being loaded into the tanks and turbulence during the filling operation, etc., could affect the degree of saturation of the effluent vented from the tanks.

In our opinion, the determination of true vapor pressure of the liquid, as cited in the control technique guideline (CTG), must depend on the determination of the Reid vapor pressure of the liquid and the application of these data to the bulk liquid storage temperature and distillation slope as described in the API Publication 2517, Second Edition, February 1980, "Evaporation Loss From External Floating-Roof Tanks."

We agree that when the horizontal, underground tanks are rapidly emptied, the ambient air drawn into the tank will not become instantly saturated and the vapor pressure of the partially saturated air may not be greater than 1.5 psia prior to filling. However, it is difficult to measure or predict and be reasonably assured that the partially saturated air in the tank will never have a true vapor pressure greater than 1.5 psia. Therefore, the degree of saturation of the vapors has not traditionally entered into the regulatory requirements of petroleum liquid storage tanks. Unless there is the ability to assure the true vapor pressure never exceeds 1.5 psia, we do not think the degree of saturation should enter into the control of JP-4 jet fuel storage tanks as suggested in the Air Force report.

Then, given that these tanks are generally subject to regulation, it has been our recommendation, as cited in our memorandum of March 13, 1981, that horizontal, underground storage tanks for JP-4 jet fuel be exempt from the requirements of the applicable storage tank CTGs. However, it is our understanding that information, based on recent tests of control equipment installed at several California air bases, indicates that control may be feasible under certain conditions. Due to the more direct involvement of the various air agency representatives in California, they should determine on a

case-by-case basis whether reasonably available control technology (RACT) is now available and if the horizontal, underground JP-4 jet fuel storage tanks require control.

Should JP-4 jet fuel be stored aboveground, then it would be subject to the control requirements of the applicable CTG. Conventional upright, aboveground storage tanks containing JP-4 jet fuel are amenable to control and, therefore, should be controlled where storage conditions cause the true vapor pressure to exceed 1.5 psia.

cc: Chuck Seeley