



Department of Pesticide Regulation



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MEMORANDUM

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TO: Saturnino Yanga
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HSM-15002

(No. assigned after issuance of memo)

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(original signed by H. Fong)

DATE: April 10, 2015

SUBJECT: RESULTS FROM CONSULTATION WITH TULARE CAC CONCERNING
VARIANCES FROM THE METHYL BROMIDE COMMODITY FUMIGATION
RECOMMENDATIONS AT A NUT PROCESSING PLANT

On March 27, 2015, I traveled to Tulare on request from the Tulare County Agricultural Commissioner's (CAC) office to provide a consultation concerning a fumigation facility in Tulare. The facility in question has two vacuum chambers that can be used for both propylene oxide (PPO) and methyl bromide. Previous to my visit, there had been a worker exposure event involving two facility employees and one county CAC staff member. The proximate cause of the exposure was failure of a manual valve controlling the flow of fumigant into a hot water heat-exchanger/vaporizer. The subsequent release of methyl bromide was allegedly greater than 10 pounds of gas, classifying this as a catastrophic release, albeit at a small scale.

The fumigation physical plant is of a very sophisticated and well maintained design, using computer control to operate the automated valves for the introduction of fumigant. According to the plant manager, the control systems are either pneumatically or hydraulically actuated because of the explosive potential of PPO (explosive range 2.8% to 37%). Avoidance of electrical sparking is of great importance with PPO.

The failed valve was a manual control valve (Photo One) that can be used to isolate the upstream lines (including the automated valves) from the heat-exchanger.



Photo One: Manual Valve



Note that the photo shows the replacement valve and not the failed one which was switched out previous to my visit. During my consultation with the facility staff and the CAC, two issues concerning recommended commodity fumigation conditions were discovered. The most pressing issue was the proximity of one of the chambers to the control room (Photo Two). The control room is within the 10-foot buffer zone normally required for a vacuum chamber (see Reference Manual Methyl Bromide Commodity Fumigation [RefMan MBr], August 8, 1994, page 82: Summary of Buffer Zone Sizes). This places the control room in non-compliance with RefMan MBr. Since the access door to the control room also lies within the buffer zone of the chamber, it is not eligible for the “shear wall” exemption (i.e. no penetrations within the buffer zone). Additionally, the ventilation of the control room appears to be internally circulating, with no clean, outside air being introduced into the control room. This is a non-compliance with Condition 10: Control Room Ventilation (page 41, RefMan MBr)



Photo Two: Control room within chamber buffer zone

Any subsequent fumigations done using methyl bromide in the south chamber will require use of self-contained breathing apparatus (SCBA) for persons working within the buffer zone, which includes the control room. The north chamber buffer zone does not extend to the control room and is therefore exempt from the SCBA requirement because of the buffer zone intrusion. However, because of the lack of fresh air ventilation (Condition 10), and proximity to the fumigation equipment and the north chamber (See Photo Three), SCBA would also be required when methyl bromide is used for this chamber too (Condition 10: Possible Alternative Conditions, page 41 RefMan MBr).



Photo Three: Fumigation equipment across from control room

Because of the physical construction of the south chamber and the control room, relocation of either structure is not realistically possible. One potential solution that would alleviate the need for SCBA, at least during the fumigation cycle, would be the installation of a real-time constant-monitoring system, such PureAire (<http://www.pureairemonitoring.com>) or Series 8900 GC (<http://www.baseline-mocon.com/>) or Uniphos 251PM (<http://ionscienceusa.com/>) or TA-2100 Methyl Bromide Gas Detector (<http://www.mil-ram.com/>). Note that citation of these devices and manufactures is not to be considered an endorsement or approval of such devices and manufacturers. Any system capable of real-time monitoring of methyl bromide to a minimum detection level of 3 ppm would be adequate.

The use of a real-time monitoring system would obviate the need for further separation of the control room and south chamber. It would also satisfy the Condition 10 non-compliance, since real-time monitoring would keep the employee and employer informed of any intrusion of methyl bromide into the control room. However, if there is a buildup of methyl bromide in the control room, a procedure for exhausting the fumigant gas from the workspace would need to be available and incorporated into any existing Fumigation Management Plan. Also, methyl bromide concentrations at or above 1 ppm would require the use of work time restrictions, as cited in RefMan MBr on page 28 concerning enclosed areas (Condition 4).

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