CONCURRENT SESSION 6 – BIOLOGICAL AGENT DECONTAMINATION

Decontamination of a U.S. Coast Guard Vessel Contaminated with *Bacillus* Spores

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The Analysis for Coastal Operational Resiliency (AnCOR) project is an interagency collaboration between the Environmental Protection Agency (EPA), Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and United States Coast Guard (USCG). One of the main goals for USCG following a biological agent incident impacting a USCG base or station would be the rapid return to service of their marine assets such as their smaller patrol boats up through their larger cutters.

The study was conducted to gain field-scale information on the use of methyl bromide (MB), low concentration hydrogen peroxide vapor (LCHPV), and peroxyacetic acid (PAA) fog for the decontamination of a decommissioned USCG 25' Response Boat Small I. Non-pathogenic *Bacillus* spores, including *Bacillus thuringiensis* subsp*. kurstaki* (Btk), *Bacillus anthracis* (Ba, Sterne strain), and *Bacillus atrophaeus* var. *globigii* (Bg) were used as the surrogates for virulent *Bacillus anthracis* in this field study.

Prior to the application of each decontamination procedure, pH-adjusted bleach (PAB) was applied to the exterior surfaces of the vessel. This procedure was conducted for each of the three rounds to evaluate the operational- and material-compatibility aspects of the vessel materials with PAB. Larger USCG vessels have external wash-down systems; a sporicidal solution like PAB could potentially be used in these spray systems to decontaminate the exterior areas of the vessel.

Several interior and exterior surfaces of the vessel were inoculated with Bg and Btk spores for each of the three rounds of this study. Inoculated surface types were marine grade aluminum, non-porous seat material, anti-slip plate, bumper material, marine grade carpet, painted outboard motor cowling, and glass. In addition, coupons (15 mm samples of material) were made from several boat materials and inoculated with 106 CFU surrogate spores (Ba Sterne, Bg and Btk). These test coupons were placed in various locations throughout the vessel for each of the 3 rounds.

All of the 90 coupons for the MB round had no detectable spores following treatment. In addition, all of samples from the 11 inoculated areas were non-detect following treatment with MB. Following treatment with LCHPV, 12 of the 90 coupons contained viable spores. Five out of 16 of the sponge-stick samples and 2 out of 6 of the micro-vacuum samples were also positive following LCHPV treatment. All of the 90 coupons for the PAA fog round also had no detectable spores following treatment. In addition, all of samples from the 11 inoculated areas were non-detect following treatment with PAA.