Effective RN Decontamination of Sensitive Equipment Method Formulation Using Non-Radiological Surrogates

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Decontamination of Sensitive Equipment (DOSE) is a big challenge to the Canadian Armed Forces (CAF) and NATO allies. Electronics (e.g., radio, computer) and optical (e.g., camera, lenses) equipment which have special cleaning instructions and a delicate nature are examples of sensitive equipment. Optimization of a decontamination method for sensitive equipment is much desired.

Defence Research Canada (DRDC)'s Ottawa Research Centre (ORC) has conducted radiological and nuclear (RN) decontamination research, including the DOSE project for quite some time until its closure in 2017. Some of the results were presented in the 2016 EPA conference. Suffield Research Centre (SRC) now has the mandate to continue the DOSE work for the CAF. Their recommendation was to use commercial-off- the-self (COTS) agents to find an efficient decontamination formulation for sensitive equipment. From this motivation, we are revisiting the DOSE project previous results, and making recommendations to push the project forward. To this end, here we present the findings of different decontamination techniques that had been tested using non-radioactive surrogates at ORC. The aims of this work were twofold: (1) Equipment functionality testing; and (2) Estimation of decontamination efficiency. Non-rad surrogates give indications of post-decon equipment damage and functionality issue; but these are not suitable for the estimation of decontamination efficiency. Therefore, estimation of decon efficiency is beyond the scope of this presentation.

The non-radioactive surrogates that had been used included cesium chloride, cobalt and iridium metals and strontium nitrate. In these tests, sensitive equipment (specifically Raspberry Pis and gun parts) were contaminated using Shake N Bake and micro-spray techniques. Decontamination techniques employed included vacuum, duct-tape, wet wipes, compressed air, and cyber putty. Method evaluation was governed by criteria such as visible signs of chemical reaction, equipment damage and functionality testing of the equipment. Post-decontamination survivability and damage of the sensitive equipment were monitored by functionality testing visual inspection and microscope imaging. Based on the tests results and the ease of operation, cyber putty technique has been scored the highest caliber.

In addition to the above results, we are currently pursuing DOSE experiments towards the above criteria evaluation for sensitive equipment using RDS2000 reagent. The results from these experiments will be compared with the previous techniques and presented during the conference.