TECHNOLOGY CAFÉ: SESSION C

11 Radiological Decontamination of Electronic and Opto-electronic Equipment

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Raspberry Pi- an open electronic and night vision device- an opto-electronic equipment represent Sensitive Equipment (SE) in terms of their decontamination preferences according to Canadian Armed Forces (CAF) and NATO allies. SE includes those items that cannot be decontaminated by commonly used methods such as aqueous- and organic-based liquid decontaminants without degradation of the items performance and require special treatment. These equipment have significance on military mission success due to their critical role and availability for re-use.

Defence Research Canada (DRDC)'s Ottawa Research Centre (ORC) and Suffield Research Centre (SRC) has conducted radiological decontamination of SE research over the past decade. Some of these results were presented in the 2019 EPA conference. The main objective of the decontamination of SE project was to establish effective radiological decontamination methods for SE using commercial-off- the-self (COTS) agents and tools. The objective includes higher rate of decontamination and retaining the functionality of the test pieces. Decontamination of Raspberry Pi coupons from two shorter-lived radioisotopes namely, 99mTc and 67Ga using putty, gel and RDS 2000 have been conducted. The isotopes are gamma emitters; relatively easy to characterize using gamma spectrometry. The short-lived 99mTc and 67Ga have half- lives of 6h and 78h, respectively. The radioactive wastes generate from these tests decay to ambient activity within a month leaving less waste management burden. These radioisotopes are available relatively easily. The above noted merits justify the use of the isotopes. The test pieces were contaminated by mist dispersion in a confined chamber. Decontamination rates and post-decontamination functionality of the Raspberry Pi coupons were examined. Results from the three different methods such as (a) use of putty, (b) use of gel and (c) use of RDS 2000 were analyzed and compared. The results concluded that the use of putty was the best choice in terms of decontamination efficiency and survivability of the electronic coupons.

Based on the above observation, decontamination work was extended to night vision device. Preliminary results show an effective decontamination of both radioisotopes on the device from all the three decontaminants noted above. Post- decontamination functionality testing for night vision devices are in progress. These results will be presented and discussed in detail in the conference.