



FACT SHEET

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Mobile Swab Station (MSS) and Mobile Express Scanner (MExS)

Introduction

1. On 12 May 2020, the Multi-Ministry Taskforce on COVID-19 announced that the number of swab testing done per day at the migrant worker dormitories will be ramped up in the coming weeks, as part of the commitment to test all migrant workers to make sure they are free from infection. Swab tests are an integral part of the nation's fight against COVID-19 as it helps to determine whether a person has contracted the virus. Swab tests are also highly risky for healthcare workers as they are done in proximity with the patients.
2. As the Inter-agency Task Force (ITF) expands their swab operations to non-Purpose-Built dormitories, which include factory converted dormitories, construction temporary quarters and private residential premises, there is a need for swab operations to be set up at different sites on a daily basis. The Combat Service Support (Technical Support) Task Force, co-led by Military Expert 7 (ME7) Low Koon Huat, Head Land Technology Engineering Group, HQ Maintenance and Engineering Support (HQ MES), and Mr Sebastian Lim Hong How from the Defence Science and Technology Agency (DSTA), initiated work teams to develop solutions in anticipation of the need for rapid swab operations. DSTA, MES and ST Engineering developed the Mobile Swab Station (MSS) that allows swift deployment of swab teams to various locations, while ensuring that their safety is not compromised. The Army Engineers from MES also developed the Mobile Express Scanner (MExS) to improve the efficiency of the swab registration process. While the MExS can be deployed independently, when deployed with the MSS, they provide a holistic, end-to-end solution that improves the overall efficiency of the swab operations. The MSS supports the ITF in the current swabbing strategy for foreign workers. It allows the ITF to proactively swab foreign workers in the non-purpose built dorms as part of the ITF's overall swabbing strategy.
3. As of 13 May 2020, there is one MSS being deployed to cater to swabbing operations at non-Purpose-Built dormitories across Singapore.

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Mobile Swab Station (MSS)

4. The MSS is an integrated platform using the Singapore Armed Forces (SAF) Cross Country Ambulance, modified to be mounted with a similar swab protection screen used by Singapore General Hospital's SG Swab Assurance for Everyone (SG SAFE) system¹.
5. With the MSS, logistical and administrative requirements such as the need to set up and tear down swab operations equipment have reduced from 30 minutes to 15 minutes. Each MSS can be set up by three operators, namely the transport operator, the healthcare personnel conducting the swab, and another personnel to collect the swab sample after the swab is completed.
6. The MSS allows swabs to be conducted on-site without having to transport potential COVID-19 patients to a separate medical facility. The safety of personnel involved is also enhanced as swab operations are conducted in a safe, enclosed space with positive air pressure, thus improving the ergonomics and safety of the personnel.
7. Compared to a typical modification project that can take more than three months, the MSS was operationalised within three weeks from conceptualisation.
8. With the modification of the SAF Cross Country Ambulance, the team of Army and DSTA engineers conducted mobility trials to ensure that the safe operation of the vehicle is not compromised. The ventilation and filtration system currently used in SAF platforms were also incorporated into this modification to provide positive pressure in the MSS, and to filter particles in the air that enters the cabin.
9. Beyond the cross country ambulance, the team is also working on two more MSS prototypes by end-June 2020: (i) the Multi-Utility Vehicle that will be equipped with one swab station; and (ii) a 20' Container that will be equipped with three swab stations. This allows the SAF to better support national requirements in the fight against COVID-19.

Mobile Express Scanner (MExS)

10. Swab operations entail administrative work that are labour-intensive and time consuming. To overcome this, the Army Engineers from HQ MES developed the MExS Application to improve the efficiency of the swab registration process and optimise the deployment of the swab teams. The MExS minimises error by automating data extraction from Identity Documents using Optical Character Recognition, and consolidating all the data into a secured central database. Swab labels can then be seamlessly printed and used to label the swab test request forms, swab sample vials, and swab sample manifest list.

¹SG SAFE is jointly developed by Singapore General Hospital and local biomedical incubator, The Biofactory. The SG SAFE System is made of industrial grade chemical resistance material; it is a U-shaped transparent booth that allows healthcare workers to just wear an N95 mask and conduct swab tests using a pair of biosafety level 3 gloves built into the panel. The booth is then disinfected, and ready for the next patient. The entire process takes about two-and-a-half minutes.

11. Since 9 May 2020, 10 sets of MExS have been deployed to 38 sites islandwide, covering around 2,000 patients. The MExS reduced the average registration time from four minutes to less than one minute. The MExS not only reduces the swab administrator's contact time with the patient, but also ensures accuracy in the tagging of swab samples.

12. The MExS was developed in-house by Army engineers within one week from conceptualisation. The speedy deployment was also made possible with the support from the DSTA procurement team for the quick acquisition of thermal printers for swab sample labelling.

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