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ESA CREW CONFERENCE OPERATIONS DURING THE COVID-19 PANDEMIC

Abstract

Space missions involving humans are complex. This can be for several reasons: firstly, crew safety is of upmost importance as any mission involving humans is inherently dangerous; and secondly, ensuring a reliable and continuous stream of communication between ground and onboard crew is essential to maintaining concise and efficient coordination of scheduled timeline activities, and ensuring mission controllers on the ground are informed of any on-board anomalies during operations. Communication with the onboard crew comes in various forms, with the most common approach via a voice loop system implemented over dedicated console positions within the mission control room environment. Another method for crew communication is through dedicated crew conferences consisting of scheduled sessions comprising private video/audio-only conferences with various ground disciplines, utilizing standard conferencing software. These provide an opportunity to communicate certain mission items to crew, delivering relevant status updates and general tag-ups with respect to crew wellbeing and specific activities within the increment. Typically, crew conferences are configured internally by the ground control team and are attended in person by the relevant operations teams in a dedicated physical meeting room containing the conferencing equipment. In 2020 the world was introduced to the COVID-19 pandemic, affecting the health risks and daily lives of everyone, and causing highly restrictive lockdowns across the majority of the world, forcing many industries to evolve and adopt work-from-home (aka "home office") practices. This home office approach, in addition to strict social distancing rules, resulted in major changes in how space operations were conducted, specifically at ESA's Columbus Control Center in Germany where, previously, many persons shared one control room. These changes included control room swaps after every shift, home office for the majority of subsystems engineers and management personnel, permanent wearing of masks during operations, and the introduction of strict on-console hygiene protocols. Particular challenges arose throughout ISS increments 65-67 when ESA had a total of three crew members on-board and pandemic constraints didn't allow for team participation in crew conferences from a central location. The ground control team at Col-CC was tasked with quickly devising a method on how to configure and execute crew conferences despite all of these major constraints. This paper aims to address the solution that was implemented at the Col-CC in order to maintain effective conference communication between ground and crew during the pandemic, and how this revolutionized crew conferences for future missions to the ISS involving ESA crew.