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IMPROVING FLIGHT SAFETY METHODS AND CONCEPTS TO FIT FUTURE CHALLENGES AT THE GUIANA SPACE CENTER

Abstract

With new launch vehicles (Ariane 6, Vega-C) and new mission profiles coming to the European Space port in French Guiana (CSG), launch safety process should be improved in order to maintain flight safety standards and to respect the requirements of the French Space Operation Act regarding the new risks induced. Therefore, the Flight Safety Department at CSG is working on the development of new concepts and methods to fit these upcoming challenges and ensure the best protection possible to people, environment and goods. In the new organization that is proposed, the flight termination decision remains on a human authority, but the process leading to the evaluation of the dangerousness is modified in order to gain reactivity and effectiveness. Today, for a given mission, the flight safety team is composed of at least four officers. The telemetry officer analyses the launcher's on-board parameters to detect any potential abnormality. Two other officers monitor the launcher's trajectory, given by two different localisation means in order to respect the Fail Operational criterion during the mission. The last officer deals with the meteorological issues and the on-orbit collision risk at launch, and can replace any other officer if needed. This organization involving at least four people requires a codified dialog loop between the operators in order to smoothly share the information and get a precise understanding of the situation. However, this loop is very time consuming and may introduce some difficulties if the launcher's condition deteriorates. Tomorrow, the focus is made on improving the reactivity within the team, mainly by shortening the operational dialog loop and putting the accent on the evaluation of the flight criticality. To do so, the team will be reduced to two officers: one main flight safety officer and one officer to confirm the decision and to ensure the back-up function. The main officer's screen will gather both the information formerly analysed by the telemetry officer and the launcher trajectory. This trajectory will be automatically calculated as the best information available. In this way, the team will no longer need neither the telemetry officer nor one of the officers in charge of the trajectory monitoring. However, the assignment of the responsibilities and the tasks will be redefined to fit the new operational roles in the new CSG. This change in the organization within the flight safety team brings many technical challenges but is expected to expand the capacity of CSG to conduct more missions in less time, and to better allocate the operators between multiple launch configurations, among which reusable launch vehicle considerations.