SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
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THE INTERACTION BETWEEN SKYLON AND THE INTERNATIONAL SPACE STATION

Abstract

The Skylon development plans include a two year test flight programme at the end of the next decade. This comprises around 400 flights that will fully verify the operational requirements, all the abort modes and overall system reliability, and will reflect a flight development philosophy closer to an aircraft than an expendable launch system. Among the operational functions that will need to be tested are those related to the interactions with in orbit facilities, such as rendezvous, docking, and the transfer of crew and cargo. To conduct these tests requires a target in-orbit facility capable of supporting these operations and the only realistic option is the International Space Station (ISS).

The paper outlines the part of the test flight programme which involves 14 flights to the ISS in the second year. These flights will demonstrate the capability of the Skylon vehicle with both an unpressurised docking adaptor, and a pressurised cargo/crew delivery module.

The flight rate during the test programme means that there would be more that one Skylon flight to the ISS each month, tripling the number of annual docking operations for the ISS. Further these flights would deliver 16 people and nearly 50 tonnes of logistics supplies. These factors combined mean there is a danger that the ISS operations become overwhelmed by the Skylon test flights. It is this consideration that led to the selection of 14 flights, seen as the minimum necessary to prove the in orbit interfaces.

At first sight, given the past problems with the ISS crew and logistic support capability, these flights could be seen as a welcome enhancement of the logistics support for the ISS. However the ability to effectively use them is subject to a number of constraints. Although these flights will occur be after more than a hundred previous test flights (more than the total number of Shuttle or Ariane 5 flights) they are still development flights obvious attendant uncertainties.

It follows they would be in addition to the normal logistics supply systems. It could be an opportunity to either extend the ISS life or to flight test items for a next generation station. However the degree to which these flights could be exploited in this way will depend on the funding available to develop such items in parallel with the Skylon development.