

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)  
Space Stations Assembly and Operations (3)

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THE DELIVERY OF LAST ELEMENT OF THE INTERNATIONAL SPACE STATION, THE NODE 3:  
CHALLENGES AND LESSONS LEARNED

**Abstract**

Thales Alenia Space has been involved in several International Space Station (ISS) elements, but the Node 3 represents the last element of the ISS assembly phase. It went through various functional definition phases and many changes to try to implement all the residual needs for the ISS. The Node 3 element is extremely complex both in terms of functional & physical architecture and in terms of operational objectives. It represents the critical element for on orbit crew support via all the racks for environmental support and crew exercise. Critical operations like reconfiguration for transfer of Cupola launched on Node 3 to its final location, activation, EVA operations are analysed, assessed and validated from operational and design standpoint. The “last minute” capability to support new needs due to reduced Shuttle launches, new functionalities accommodation missing at ISS level has been the most relevant challenge of the last year. The Thales Alenia Space role in the ground processing after the spring delivery is the new experience under preparation in order to get ready for the launch and the on orbit operations.

The intent of this paper is to collect lessons learned from a design and development phase as well as from the integration, test and close out activities.

The paper intends to address the main challenges and difficulties, as well as the flexibility.

The paper also intends to address processes improvement identified during the program due to the management of a complex element, to the schedule criticality, to the change requests agreed in all projects phases and to recurring activities, mainly due to modification and alternate operational needs.

Attention is also given to the “certification process” leading to the flight readiness.