

Usability Engineering for the International Space Station

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Sheet 99.2-10/E

In previous manned space missions the usability of the payload user interfaces proved to be unsatisfactory: individual interfaces showed bottlenecks and consistency among interfaces was lacking. Some of the problems arose, because the software for monitoring and control of payloads is being designed by diverse companies using different design approaches and user interface concepts.

An electronic (web-based) handbook is being developed that provides on-line guidance for the interface designers of these companies to realise usability and consistency based on experiences with space missions and recent cognitive engineering approaches. The handbook is part of the Advanced Crew Terminal software development environment providing on-line search and navigation support to guidelines, standards, techniques and examples that apply to the current design problem and development stage.

Some results

- A first version of the usability handbook has been developed providing the general usability engineering method and an example application for the user interface of a glovebox.
- A usability test showed that two support concepts for payload supervision and control enhance the efficiency of payload operations substantially: [1] the integration of rule provision into the user interface and [2] the provision of navigation support.

Organisation

Main contractors are the European Space Agency (ESA) and the Netherlands Agency for Aerospace Programmes (NIVR). The activities are attuned to current developments at the National Aeronautics and Space Administration (NASA). Co-operation takes place with Origin, NLR, Mooij Holding BV (The Netherlands) and TERMA (Denmark).

The image displays two overlapping browser windows. The top window, titled 'A Usability Engineering Method - Main Menu - Microsoft Internet Explorer', shows a navigation menu with buttons for 'About', 'Read Me', 'Introduction', 'Method', 'Example', 'Guidelines', and 'Release'. The 'Method' section is expanded to show 'Introduction', 'Analysis', 'Design', and 'Implementation'. The bottom window, titled 'Storyboard ACT - Microsoft Internet Explorer', displays a checklist for 'Check air circulation function (FS)'. The checklist items are: 'Check that lower in Work Area is fully open. Lower knob should be pulled to the front.', 'Check that AIR_CIRC rotary switch on Control and Monitor Panel is in position "1". Position "1" is fully counterclockwise.', 'Switch AIR_CIRC momentary switch in OVERRIDES field of the Control and Monitor Panel to ON.', and 'Turn AIR_CIRC rotary switch on Control and Monitor Panel to position "6". Position "6" is fully clockwise.' To the right of the checklist is a 'Multimedia Documentation System' window showing a photograph of a 'Control and monitoring panel' with a blue circle highlighting a specific component.

The usability handbook with an example glovebox interface.