

# Decision Support Technologies

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*Abstract*— As we approach the end of the Shuttle era, NASA has accumulated over 50 years of experience with developing and implementing operations concepts for human missions into space. However, no crewed mission has ever been mounted to a destination beyond the Earth-Moon system. One of the grandest challenges that NASA must meet in order to enable journeys to more distant destinations, such as Mars, is how to “re-tool” mission operations to adapt to the fact that speed-of-light

limitations are going to force astronauts to deal with mission problems, such as systems malfunctions and equipment failures, without real-time assistance from subject matter experts at mission control. I will discuss the scope of this problem and discuss the crew-machine interfaces and decision support technologies that must be developed, tested, and built to provide the astronauts with the capabilities they will need to manage deep-space mission anomalies.