Introduction:

• NextGen technologies promises to enhance operations and improve safety in the US National Airspace System.

• Five of these NextGen technologies are:
  - ADS-B,
  - System-wide information management (SWIM)
  - Data communications
  - NextGen Network Enabled Weather (NNEW)
  - NAS Voice Switch

• Human factors evaluation in this study focuses on how pilot and controllers share information.

• We are particularly interested in the potential for breakdowns in coordinated decision making (Bearman, Paletz, Orasanu & Thomas, 2009).

Method:

• The five key technologies of NextGen were identified from FAA documents that specified critical components that need to be in place for NextGen to work effectively.

• A technical expert presented key aspects of the technologies to a panel of human factors experts

• The panel consisted of 4 experts in human factors who ranged from 6 to 26 years of experience.

• There were five panel group sessions in total (one technology per session), with each session lasting for approximately one hour.

Results:

Issues that were identified were:

• Decision Making will not necessarily improve just because pilots and controllers possess the same information

• Having a common information source does not mean pilots and controllers are looking at the same information

• High levels of automation may lead to disconnects between the technology and pilots/controllers

• Common information sources may become the definitive source for information

• Overconfidence in the automation may lead to situations where appropriate breakdowns are not initiated

Discussion:

• Pilots and controllers need to be able to communicate information about their current mental model.

• Pilots and controllers should not assume that a common information source will always be the basis for decisions

• Pilots and controllers need to access information about the basis for a decision

• Pilots and controllers need to have the tools to appropriately deal with perturbations to the system

• New technology should be considered as a new team member who needs to communicate effectively and be clear about how they are functioning

• More research needs to be conducted as the technologies develop and are integrated into the flight deck and control rooms

• The current state of development of these technologies provides a good opportunity to utilize recommendations at an early stage

Acknowledgements

• We would like to thank Ute Fischer and Kathy Mosier for their assistance with the project.

• This research was funded through the FAA/NASA NextGen Program.