

Short-term consequences of radio communications blackout on the U.S. National Airspace System

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Abstract-

Loss of Air Traffic Control (ATC) radio communication is considered a high consequence failure due to the potential increase in mid-air collision risk. An analysis was conducted to determine how quickly collision risk would increase after a full ATC communications failure, or blackout, to determine requirements for backup communication systems. The analysis was conducted for the enroute high-altitude environment and also for terminal area operations in the New York City region. Communication failure simulations were run every 15 minutes using 7 days of ETMS data for the entire U.S. airspace, and using 5 days of PDARS data for New York City region. Conflict rates were observed to increase beyond the baseline level within 1 minute of the simulated communication failure and to have increased by at least a factor of 4 within 5 minutes of the communication failure indicating the requirement for immediate backup ATC communications.

Index Terms- Air Transportation; Air Traffic Management; Safety analysis; Mid-air collisions; Communications failure

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