SAFETY PROBLEM

• Separation Incidents 2011-2012 in Swedish Air Space

• Either ATC did not pay sufficient attention to the tools (should try harder)

• Or the tools were not sufficiently clear (should be designed better)
Case study - to uncover basic human-automation collaboration strategies
CASE STUDY

Scenarios with irregularities

During verification-of-competence training

Overflight and climb / descend areas

12 fully licensed ATCOS with valid ratings
6 male, 6 female, 9-38 years of experience

6 Planner 6 Executive

Divided into four conditions
- 3 Planner - overflight
- 3 Planner - climb/descend
- 3 Executive - overflight
- 3 Executive - climb / descend

MTCD was only used in overflight area
SITUATION AWARENESS

Based on Lundberg (2015)

A process ...

... of understanding what goes on in uncertain dynamic situations....

... through collaboration with automated tools and other agents...

CONFLICT AND RISK DISPLAY
When a conflict becomes visible on CARD, then what does the ATCO do?
GAZE PLOT based on eye tracking recording
When a conflict becomes visible on CARD, then what does the ATCO do? (What role does CARD and FLEG have in conflict detection?)
STRATEGIES

• A: Rely primarily on the automation, examine conflicts as they emerge on MTCD

• B: Rely primarily on an own independent scan, check MTCD now and then.

• ....: Combinations, variations?
A. RELY ON AUTOMATION
VS. B: INDEPENDENT SCAN

a. checking card first vs b. checking card AFTER examining the conflict
E. LOOKING AHEAD

An ideal situation
How could this result in separation infringements...?

C. DELAY IN DETECTION

48 second delay
D. SHORT TIME TO CONFLICT

... how could this result in separation infringements...?
...INFRINGEMENTS...

- A delay in conflict examination (C)
- + short time to conflict (D)
- could result in an infringement.