

# 2002: Midair collision Überlingen



# 2002: Midair collision Uberlingen (con'd)

## ■ General context

- Both at FL360

- ➔ Passenger TU154M Moscow-Barcelona

- ➔ Cargo B757 Bergamo-Brussels

- Dark night

## ■ ATC context

- ATC radar system was not fully functional

- ➔ The optical STCA that would alert the controller 2.5 mn prior to impact

- Failure of the telephone system

# 2002: Midair collision, Uberlingen (con'd)

## ■ ATC context (end)

- Only 2 controllers were responsible of the entire Zurich Airspace:
  1. Radar planning controller
  2. Radar executive controller
  3. Approach controller
  4. Radio communications
  5. Functions of chief controller
- Some positions were not filled
- The controller during the midair collision was responsible for:
  - 2 adjacent workstations
  - With 4 functions (1, 2, 3 and 4).

# 2002: Midair collision Uberlingen (con'd)

## ■ Operational context

- About 50" before collision:
  - ➔ ATC instructed TU154M to **descend** to FL350
  - ➔ **No** response was heard from the Russian crew.
- Seconds later:
  - ➔ A second descent instruction was made
  - ➔ The Tupolev crew acknowledged the instruction
  - ➔ The TU154M TCAS issued a **RA climb** that was **ignored**
- At nearly the same time:
  - ➔ The B757 TCAS issued an **RA descent**
  - ➔ The crew began a descent in an attempt to avoid the conflict.
- The 2 aircrafts collided at FL354, broke apart and crashed.

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## ■ Analysis

- TU154 should have descended to FL350
- Controller
  - Noticed the dangerous separation too late
  - Due to being busy with the inoperative telephone system
- Instructions given to TU154M were not appropriate for the urgency of the situation
- Controller did not notice the “TCAS descent” transmission from the B757 crew.

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## ■ Consequences

- All on board died from collision and crash:
  - ➔ TU154M: 9 crew and 60 pax
  - ➔ B757: 2 crew
- Both aircraft were destroyed and debris scattered over an area nearly 40km wide.
- Some damage to fields and forests
- And... the ATC controller was **murdered** at his home a couple of days later by a relative of a deceased TU154M passenger...



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- Immediate causes (BFU)
  - The reduction in the separation was not noticed by ATC in time
  - The instruction for the TU154M to **descend** was given too late
  - The TU154M **followed** ACT instruction and continued to do so even after the TCAS advised a **RA climb**.



# 2002: Midair collision Uberlingen (end)

## ■ Systemic causes (BFU)

- The integration of TCAS in the aviation industry was:
  - ➔ Insufficient
  - ➔ Not corresponding to its philosophy
  - ➔ In contradiction with some regulations
- ATC management:
  - ➔ Did not ensure that the night workstations were continuously staffed by controllers
  - ➔ Tolerated for years that during low traffic night times one controller works and the other controller retires for rest
  - Did not provide specific directives issued regarding radar restrictions