

# The human factor



©America's Independent Light and Power Companies, by H. Miller (1957)



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**The interaction between technological,  
organisational behaviour and the human factor:  
a tale of two cases**

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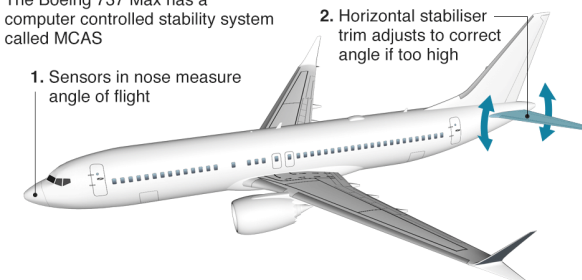


# Case #1: Boeing 737 MAX

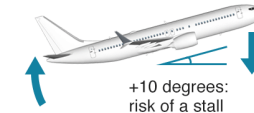
- **FAA**
  - Outsourcing of responsibility
- **BOEING**
  - Market pressure
  - Design the system similar to previous one
  - Internal signals neglected
- **AIRLINES**
  - No optional safety system installed
- **PILOTS**
  - Too busy looking up info

## How the MCAS system works

The Boeing 737 Max has a computer controlled stability system called MCAS



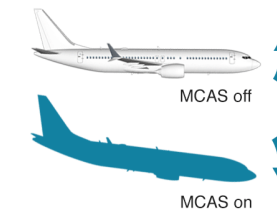
3. Nose pushed down to reduce risk of a stall



4. But if the sensor reading is wrong, MCAS may activate and push the nose down anyway

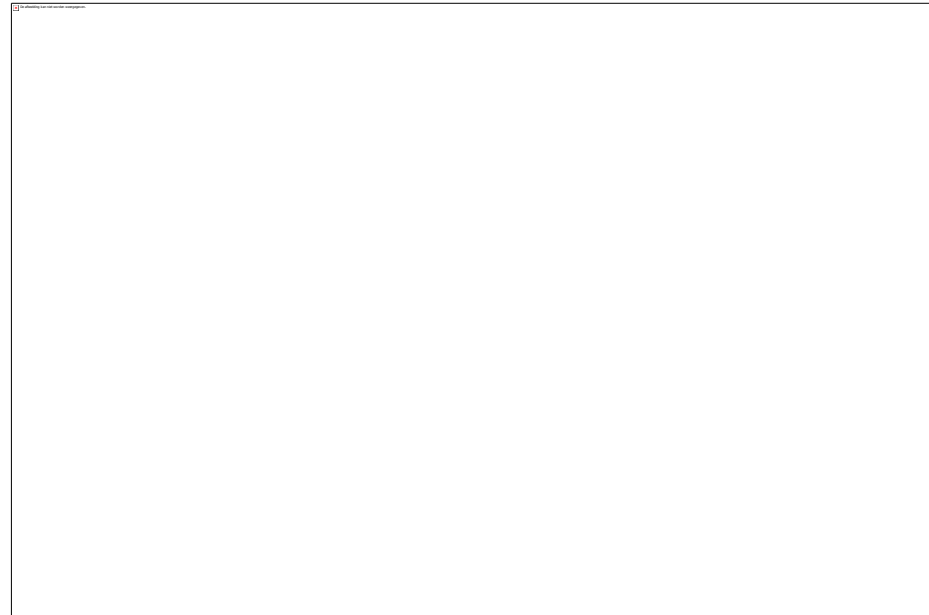
5. Pilots can temporarily switch off MCAS and pull up.

But system restarts if false readings continue, creating a tug of war between the aircraft and its crew



## Case #2: UBER crash 2018

- **UBER**
  - Technical miscalculations:  
missing use case jaywalking
  - Poor staffing decisions
  - Safety lapses: no formal  
safety plan
- **PEDESTRIAN**
  - Jaywalking



## Implications for ADAS / autonomous driving

- Dutch Safety Board report, *Who is in control - road safety and automation in road traffic:*
  - safety by design
  - failsafe
  - foolproof design
  - transparent to user
  - autonomy for user
- Role of driver changes to operator
- System reaction more complex to understand
- Legal position of driver does not change!
- New risks: (cyber) security & functional updates

## Questions?



**Thank you for your attention!**

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