



**Network Manager**  
nominated by  
the European Commission



# Just Culture - What it is and what is not

## From the Perspective of Work-as-Done vs. Work-as-Imagined

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# Work-as-Imagined



# Work-as-Done



**WORK**

**AS**

**I MAGINED**



# Work-as-Imagined and Work-as-Done **scenarios**

- Why would a controller allow an aircraft to fly below minimum safe altitude?
- Why would an engineer take an undocumented shortcut?
- Why would a pilot not take action to ensure aircraft avoid a thunderstorm?
- Why would a controller use equipment she is not licenced to use?
- Why would a pilot ignore manufacturer's manuals and airline emergency procedures?
- Why a supervisor would not accept the split sectors when workload escalates ?.

# Part 1: Work-as-imagined



# **Assumption 1: The organisation is like a complicated machine**



# Assumption 1: The organisation is like a complicated machine

1. Systems have defined, unchanging goals;
2. Systems are the sum of their components;
3. Components and cause-effect relationships are discernible ;
4. The system has a design and works predictably, as designed;
5. Demand is known and predictable;
6. Resources are 'in a good state';
7. Everything of interest can be quantified and compared.



# Assumption 2: The human is a hazard



## Assumption 2: The human is a hazard

1. People are unreliable;
2. People break the rules to make life easier;
3. People act irrationally and dangerously;
4. People degrade safety in otherwise safe systems;
5. If everybody 'did their job', it will be alright.

# Assumption 3: Things go wrong and things go right for different reasons



## SAFETY

*is our Primary Goal!*

**DAYS SINCE LAST  
ACCIDENT:**





## Assumption 3: Things go wrong and things go right for different reasons

1. Success and failure are fundamentally different;
2. Consequences result from good or bad component behavior;
3. We can judge performance objectively and identify causes.

# Implications of these assumptions for Just Culture

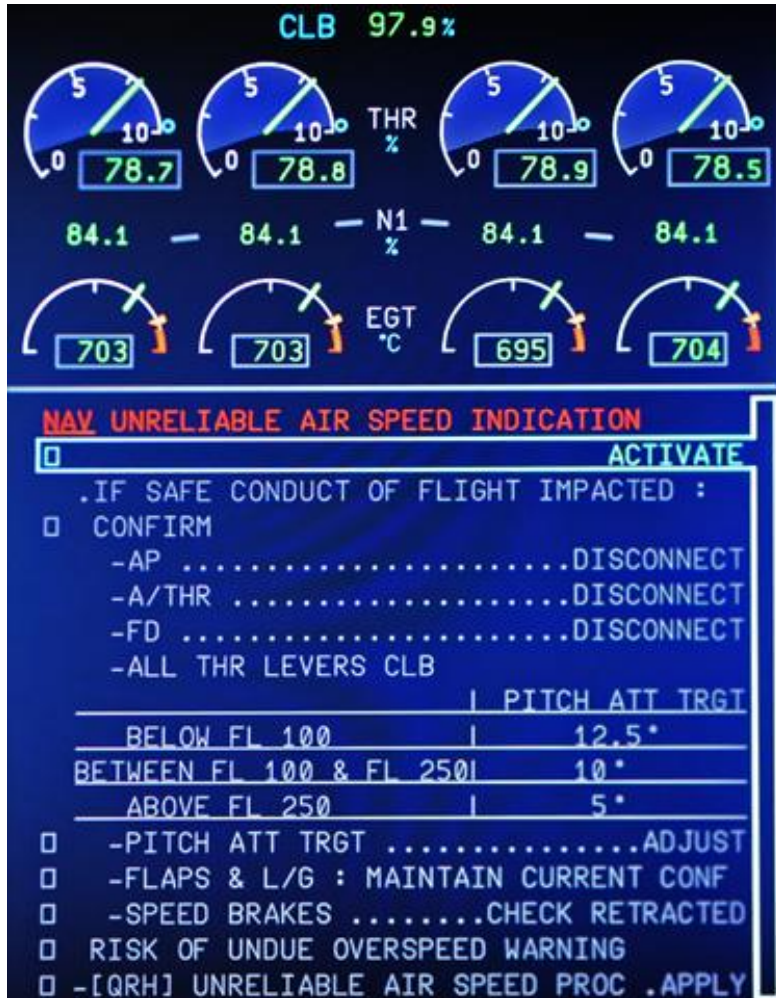
1. We should focus only on failure – how things go wrong;
2. Systems are best understood when decomposed ;
3. People should be judged strictly against procedures, separately from the context;
4. We should take account only of what people did, not why they did it.

# Interlude



# The Black Swan

## Electronic Centralised Aircraft Monitor (ECAM)



Richard de Crespigny <http://bit.ly/QF32ECAM> With kind permission



“THE ECAM threw up so many failures, degradations and checklists...that **I could not evaluate all the interactions and consequences of the cascading failures.**”

“The ECAM system was becoming **overwhelming.**”

“the cockpit would have appeared to be in **utter chaos.**”

“We were all in a **state of disbelief...**”

“ECAM was **not helping us**”

“We were facing **ECAM Armageddon**”



**“Clearly the ECAM was not programmed to cater for this many concurrent failures...It didn’t make sense...I started to have doubts about ECAM.”**

**“We were chasing a computer program around when perhaps we should have been flying the plane and just landing.”**

**“My confidence in ECAM was waning. It was just a computer program, it was just a checklist, it couldn’t adapt for multiple failures in one system...”**

**“We’d all become overwhelmed with the sheer number and layered complexity of ECAM alerts, and the “logical” way ECAM was trying to check and fix the aircraft.”**

**“It was just a computer program”**





**“I need to know what is still working.”**

**“And then I had my epiphany. My mind switched.**

**I inverted the logic I remembered what Gene Kranz, NASA’s Flight Director, said during the Apollo 13 Mission:**

**‘Hold it, gentlemen, hold it! I don’t care about what went wrong. I need to know what is still working on that space craft.’”**



# **“Pilots (and ATCOs) have judgement”**



**“By inverting our logic and looking at what was working, we were able to build out basic Cessna aircraft from the ground up.”**

**“Pilots make mistakes and they cannot process data as fast as a computer. But pilots have judgement.”**

**“There is no computer, manual, autopilot or carefully crafted standard operating procedure that will ever replace that key responsibility: to keep the aircraft in the air and in one piece.”**

In the midst of the crisis, with the crippled Airbus A380 leaking fuel while he maintained a holding pattern and the crew tried to sort through a torrent of computer-generated cockpit alerts, Capt. Richard de Crespigny switched tactics. Rather than trying to decipher the dozens of alerts to identify precisely which systems were damaged, as called for by the manufacturer's manuals and his own airline's emergency procedures, he turned that logic on its head—shifting his focus to what was still working.



Qantas Capt. Richard Champion de Crespigny, here with the repaired A380 last year, said he decided after the engine explosion to focus not on which systems had failed but which ones still worked. *REUTERS*

The issue, the commander of Qantas Flight 32 recalled in an interview last summer, was whether the plane's other engines and damaged flight controls were dependable enough to fly a stable landing approach.

"At the point of maximum stress, the cockpit displays didn't make a whole lot of sense," he said. The audible and visual alerts were incessant, inundating the crew.

By looking beyond those warnings, "we basically took control," he said, and that is

when he realized the flight would end safely.

"Symbolically, it was like going back to the image of flying a Cessna"—a simple plane that doesn't require wading through complex computerized fault messages.

Skeptics later would ask, "How could you not follow what the computers were telling you?" the captain recounted. "But I don't trust any checklist naively."



# Toad Checklist – “A List”





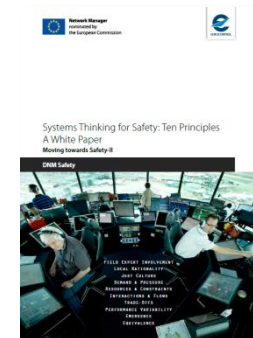
# Part 2: Work-as-Done

# Assumption 1: The organisation is like a complex organism



# Assumption 1: The organisation is like a complex organism

1. Systems have multiple, shifting goals;
2. Systems are a product of their interactions;
3. Components and cause-effect relationships are obscure;
4. Systems have evolved over time and performance varies;
5. Demand is often unpredictable ;
6. Resources are always in a degraded mode;
7. The most important things often cannot be meaningfully quantified or compared.





# Assumption 2: The human is an asset or resource





## Assumption 2: The human is an asset or resource

1. We perform well most of the time. No-one goes to work to have an accident;
2. We make tradeoffs and compromises to make the system work;
3. We do what makes sense to us...at the time in our local context;
4. We create safety in degraded systems by adjusting, adapting and varying their performance;
5. If everybody 'does their job', the whole system may be in trouble.

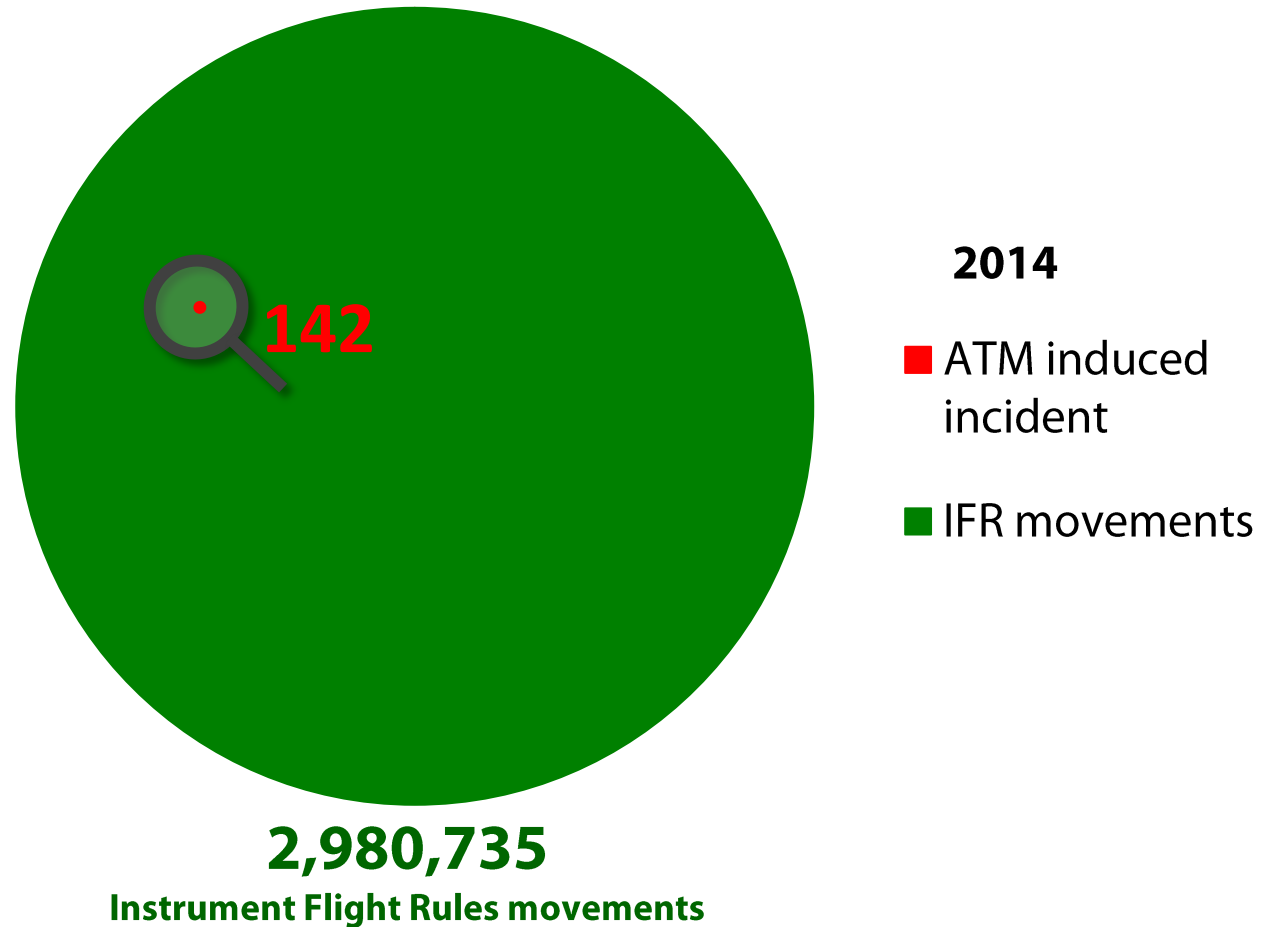
**Assumption 3: Things go wrong  
and things go right for the same  
basic reasons**



## Assumption 3: Things go wrong and things go right for the same basic reasons

1. Success and failure both relate to the ability of the system to adjust and adapt to system conditions;
2. Consequences emerge from system interactions ;
3. Analyses and judgements concerning human performance involve *post hoc* social judgments. Our mindsets, assumptions & language affect these judgements.

# A normal year for a normal Air Navigation Service Provider





# Implications of these assumptions for Just Culture

1. We should take account of all outcomes – ‘how things go’
2. Sociotechnical systems are best understood as a whole, in context of ordinary work
3. Performance has to be viewed in context of the need to balance conflicting goals in degraded environments
4. We should take account of how things made sense to people at the time
5. We should reflect on our own mindsets, assumptions & language
6. **Key question for prosecutions: Does the organisation have a human factors assessment for the task?**

# Human Factors in media

## Agenda Setting Theory and Framing

### The news stories have the following focus

- (1) accidents and safety
  - (2) technology (e.g., aviation, driving, military, space, and office and consumer products);
  - (3) Health
- The most common search result for “human factors” that directly related to HF concerned specific accidents and general stories concerning accidents,
  - The accidents overwhelmingly involved transportation (aviation, road, maritime, rail, and space). A minority concerned health-care and process industries.
  - In almost all cases, human involvement was framed negatively and the human in the system (usually a member of frontline personnel) was isolated as a faulty component. In most stories, the term “human factors” was used in a general, vague, and negative sense with respect to an investigation (i.e. Human error and human as a hazard)

# The Stories of Heroes and Villains

## Agenda Setting Theory and Framing

### Miracle of Hudson River

- On January 15, 2009, a US Airways flight left LaGuardia Airport in New York, heading for Charlotte. About 2 minutes after takeoff, the plane encountered a flock of birds and lost thrust in both of its engines. The 155 passengers and crew members, including a lap-held infant, were near disaster.
- Fortunately, a hero arose. The captain, Chesley “Sully” Sullenberger, was able to ditch the plane in the Hudson River, saving the lives of all on board (National Transportation Safety Board, 2010). The pilot was praised as a “hero.”



# The Stories of Heroes and Villains

## Agenda Setting Theory and Framing

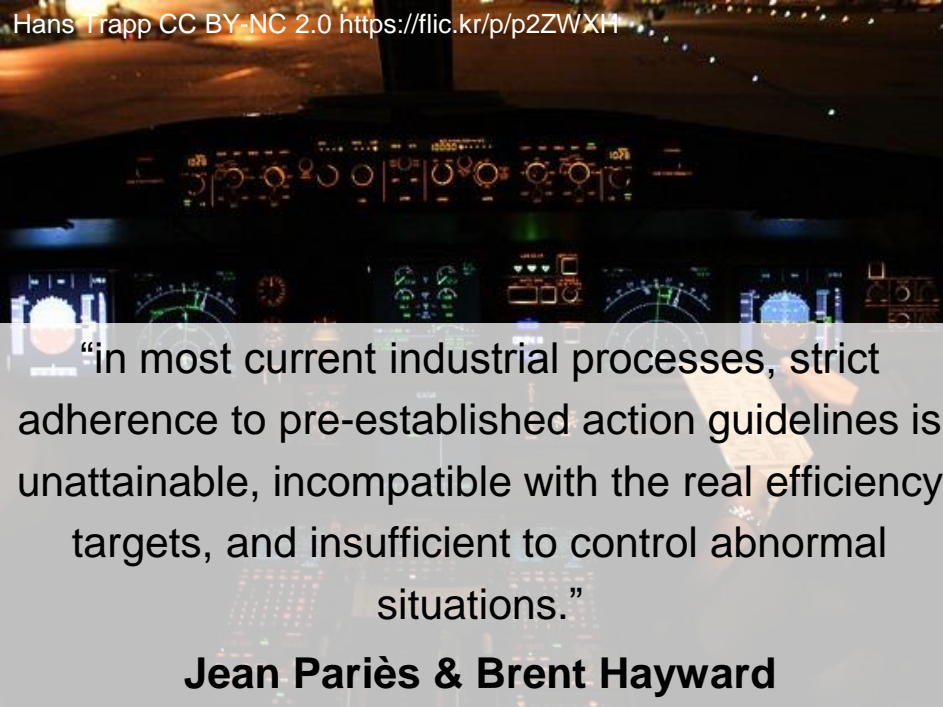


### Train crash of Santiago de Compostela

- On July 25, 2013, a passenger train was on express route from Madrid Chamartín railway station to Ferrol, Spain. On a section of the conventional track in Santiago de Compostela, 250 m (820 feet) before the start of a sharp curve, the train was travelling at 195 km/h (121 mph), when the train had to slow to 80 km/h (50 mph). Emergency brakes were applied but the train derailed 4 seconds later at 179 km/h (111 mph). Seventy-nine people died. Media reports over the next few days stated that the driver “ignored three warnings to slow down” and “admitted speeding.”
- The media reported an old Facebook post that stated: “It would be amazing to go alongside police and overtake them and trigger off the speed camera”, accompanied by a photo of a train’s speedometer at 200 km/h (124 mph).
- The press painted the driver, Francisco José Garzón Amo, as a villain who triggered an accident in an otherwise safe system. Just under a year later, a headline stated: “Confirmed: Human error caused horror train crash.”



**MIND THE GAP - GAP**



“in most current industrial processes, strict adherence to pre-established action guidelines is unattainable, incompatible with the real efficiency targets, and insufficient to control abnormal situations.”

**Jean Pariès & Brent Hayward**



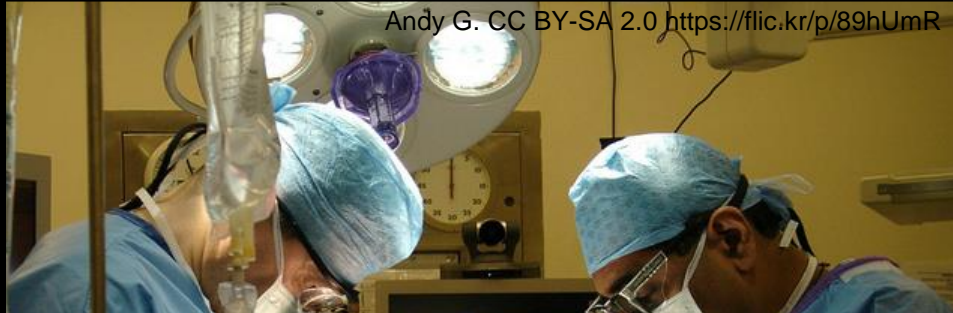
“People choose what they want to say to regulators ... The regulator can start to believe that ‘work-as-imagined’ should always match ‘work-as-done’. The right position lies somewhere in-between..”

**John Wilkinson**



“no singular overarching regulatory, standards, or policy-making body for these services.”

**John Allspaw**



“As clinicians the world over have reviewed my late wife’s case, many have stated that “I wouldn’t have done what they did...in a simulated scenario with the same real-world disorder...most actually do.”

**Martin Bromiley**





“there is a difference between policy and practice  
... administrators may not be aware of the latter.”

**Ken Catchpole & Shelly Jeffcott**



“many well-intended shortcuts and deficient  
workplace practices are routinely not detected  
during audits ... major system failures may be  
associated with this gap.”

**Ben Cook & Ryan Cooper**



“...contractors may not receive direct feedback on  
the success of, or problems with, their previous  
designs in the field, and most engineers  
designing the asset will not have worked on or  
even visited an operating installation.”

**Rob Miles & Ian Randle**



Tell me about...

**The Rule Book**

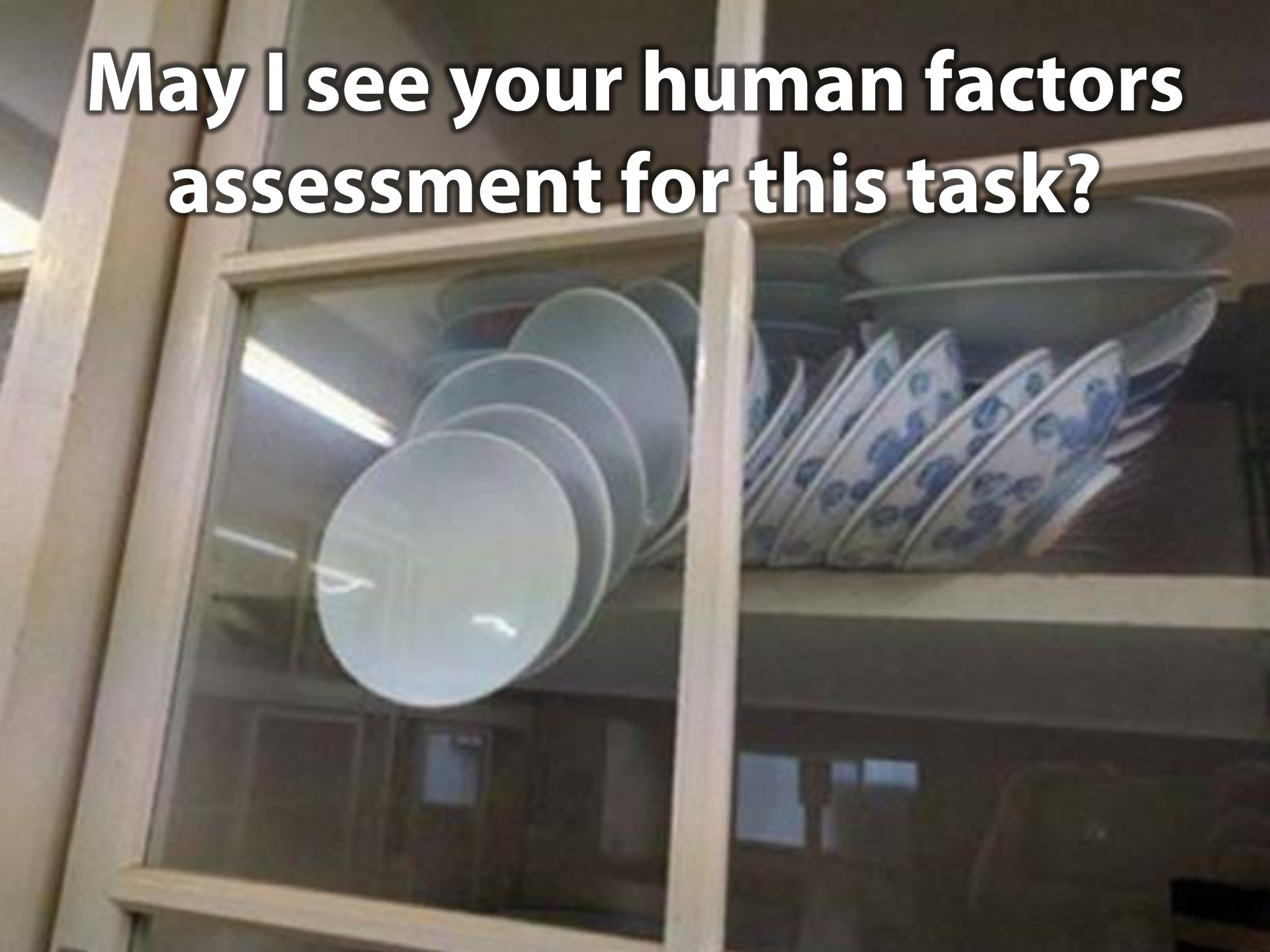
“...can be a practical necessity or a mark of  
expertise ... [but] sometimes the motivations for  
the way that the work is actually done are not  
laudable.”

**Ben O’Flanagan & Graham Seeley**





**May I see your human factors  
assessment for this task?**





# Work-as-Imagined and Work-as-Done **scenarios**

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**The whole picture**

<http://bit.ly/1pFYf58>



**bit.ly/  
ST4SAFETY**



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**Thankyou**

