Slide 1

Title:	Only bad choices
Presenter:	Richard I. Cook, MD
Conference:	EUROCONTROL ES²-WS2-13
Location:	Lisbon, Portugal
Venue:	Tivoli Oriente Hotel
Date:	26 September 2014

Key references: Cook, Woods, Miller (1998). A Tale of Two Stories: Contrasting Views of Patient Safety.

Fairbanks et al. (2014). *Resilience and Resilience Engineering in Health Care.* Joint Commission Journal of Quality and Patient Safety

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Slide 2

Old surgical saying #1:

If there are more than two operations for a single condition,

none of them are any good.

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Slide 3

Old surgical saying #2:

Good results
come from *Experience*.

Experience
comes from bad results.

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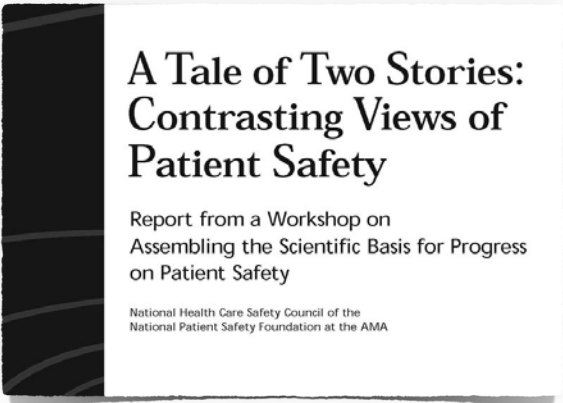*Copyright © 2014 by R.I.Cook for CTL*

Slide 4

1. There are too few accidents to guide work on safety. *The 'quality' paradigm doesn't work here. This is what success looks like.*

2. So we use arbitrary limits. *We hope these are related to safety.*

3. The limits are conservative. *We add margin because we are uncertain. See #2!*

4. We cheat. *The limits are conservative so 'minor' adjustments are reasonable and, after all, nothing [bad] happens!*

5. Production pressure keeps the operating point tight to the margin. *We use up every advantage we gain to do more or do it with fewer resources.*

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Slide 5

Origins of Safety 2: *A Tale of Two Stories,* 1998

A Tale of Two Stories: Contrasting Views of Patient Safety

Report from a Workshop on Assembling the Scientific Basis for Progress on Patient Safety

National Health Care Safety Council of the National Patient Safety Foundation at the AMA

available at www.ctlab.org

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Slide 6

Origins of Safety 2: *A Tale of Two Stories,* 1998

…enhancing safety begins with efforts to understand not just the sources of failure but also the <u>sources of success</u>. System operations are seldom trouble-free… observers find many more opportunities for failure than actual accidents.

The difference between
    the high potential for failure and
    the low rate of failure
      is produced *largely by practitioners*.

p.13 emphasis added

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Slide 7

Origins of Safety 2: *A Tale of Two Stories,* 1998

Each investigation shows how practitioners resolve conflicts, anticipate hazards, accommodate variation and change, cope with surprise, work around obstacles, close gaps between plans and real situations, detect and recover from mis-communications and mis-assessments. In these activities practitioners *regularly forestall or deflect potential accident trajectories.*

p.13 emphasis added

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Slide 8

Origins of Safety 2: *A Tale of Two Stories,* 1998

…human practitioners are not so much the cause of occasional sporadic accidents as they are the <u>active agents</u> that regularly contribute to success. When they carry out their roles successfully, they are the active creators of safety. Safety research tries to identify factors that undermine practitioners' ability to do this successfully.

p.13 emphasis added

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Origins of Safety 2: *A Tale of Two Stories,* 1998

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Slide 10

Origins of Safety 2: *A Tale of Two Stories,* 1998

The *sharp end* is where practitioners interact directly with the hazardous process in their roles as pilots, mechanics, air traffic controllers, nurses, physicians, technicians, pharmacists…

p.13, emphasis added

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Slide 11

Origins of Safety 2: *A Tale of Two Stories,* 1998

…the *blunt end* [is where] regulators, administrators, economic policy makers, and technology suppliers…
is the source of the resources and constraints that form the environment in which practitioners work.

p.13

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Slide 12

Origins of Safety 2: *A Tale of Two Stories,* 1998

The blunt end is also the source of demands for production that sharp end practitioners must meet.
The demands are often conflicted, as when the blunt end provides incentives for greater production while simultaneously demanding lower rates of failure.

p.13 emphasis added

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Only bad choices   13   **CL**

Origins of Safety 2: *A Tale of Two Stories,* 1998

> … experience with other industries indicated that the need for the appearance of a commitment to safety can sometimes take precedence over the long, painstaking efforts required to make real progress.
>
> It is much easier to talk about a "safety culture" than it is to create one.
>
> *p.39 emphasis added*

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Only bad choices   14   **CL**

Origins of Safety 2: *A Tale of Two Stories,* 1998

> …we are talking about a law of systems development, which is: every system operates always at its capacity. As soon as there is some improvement, some new technology, we stretch it…
>
> *Larry Hirschhorn*

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Only bad choices   15   **CL**

Why are there only *bad choices* left?

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Only bad choices   16   **CL**
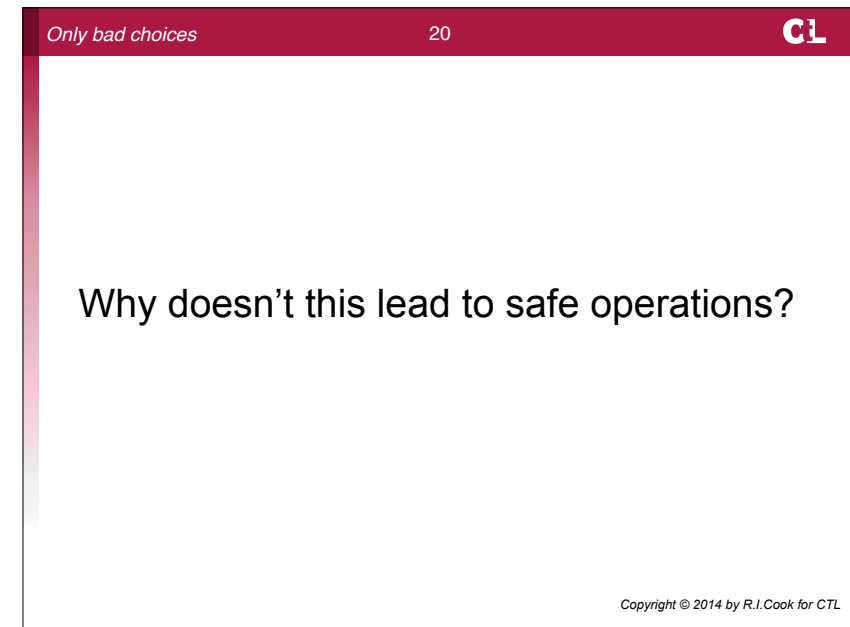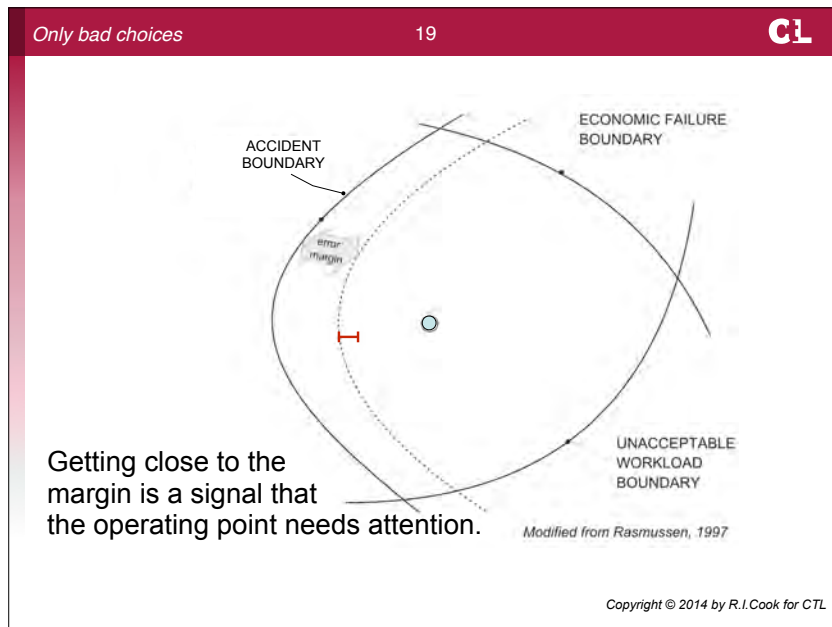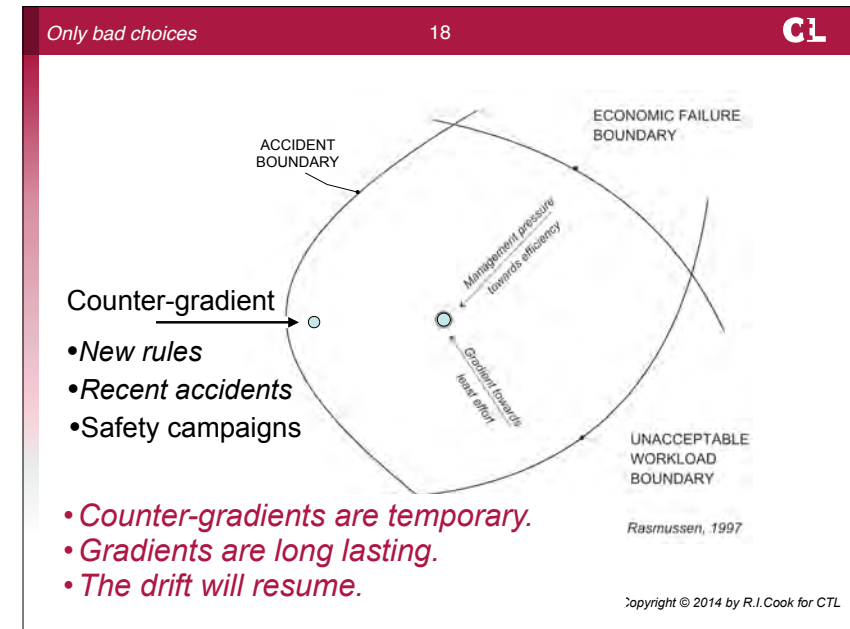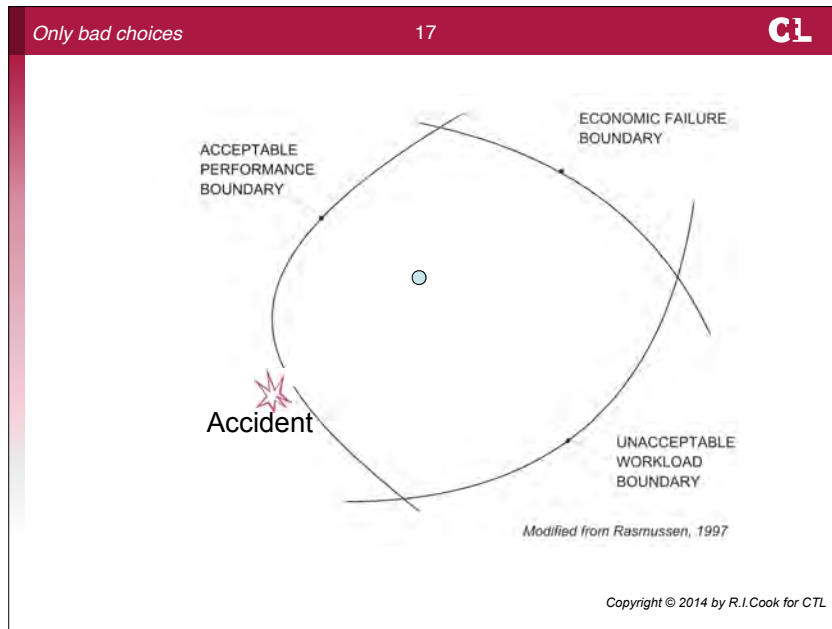

ACCEPTABLE PERFORMANCE BOUNDARY

ECONOMIC FAILURE BOUNDARY

Operating point

UNACCEPTABLE WORKLOAD BOUNDARY

Modified from Rasmussen, 1997

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- Reliable information about the accident boundary comes from accidents.
- Accidents are rare.
- The accident boundary changes.

We usually don't know where the accident boundary is.

ACCIDENT BOUNDARY   MARGIN

Slide 22

original MARGINAL BOUNDARY

Normalization of deviance…
Dianne Vaughn

① ② ③ ④ ⑤

ACCIDENT BOUNDARY

…moves the marginal boundary closer to the accident boundary.

Slide 23

original MARGINAL BOUNDARY

The result is often a slipping of the operating point towards the accident boundary.

② ③ ④ ⑤

new MARGINAL BOUNDARY

This is "flirting" with the margin

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ECONOMIC FAILURE BOUNDARY

ACCIDENT BOUNDARY

Counter-gradient
- *New rules*
- *Recent accidents*
- Safety campaigns

Intentional movement away from the margin

Management pressure towards efficiency

Gradient towards least effort

UNACCEPTABLE WORKLOAD BOUNDARY

Modified from Rasmussen, 1997

What is surprising is not that there are so many accidents...it is that there are so few!

But why?

---

resilience

The Joint Commission Journal on Quality and Patient Safety

Conference Report

Resilience and Resilience Engineering in Health Care

Rollin J. Fairbanks, MD, MS; Robert L. Wears, MD, MS, PhD; David D. Woods, PhD; Erik Hollnagel, MS; Richard I. Cook, MD

A system is *resilient* if it can adjust its functioning before, during, or following events (changes, disturbances, or opportunities) and thereby sustain required operations under both expected and unexpected conditions. Resilience is found binations of usual and unusual demands; er ruptions; variations in staffing or other resou losses or corruptions; diffuse, varying, or con critically, incessant change. It is the resilience

Resilience is <u>at least</u> as important in ATC as in medicine.

Resilience:

- Prominent in complex operational worlds
- Distributed
  - through space
  - across agents (people, machines)
  - over time scales (seconds to decades)
- Dependent on expertise, esp. anticipation
- Requires balanced goal sacrifice
- Resists quantification
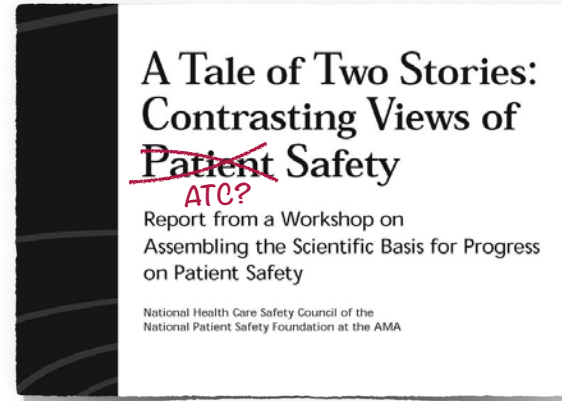- <u>Hidden</u> in ordinary operations

---

Exercises:

1) Where is the operating point <u>right now</u>?

2) How do you know?

3) How do you prepare for production pressure you know is coming?

4) What 'ordinary' stuff moves the OP past the margin?

5) What *Tale of Two Stories* bits seem relevant to your experience in ATC?

6) How can we make this clearer to others?

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A Tale of Two Stories:
Contrasting Views of
~~Patient~~ Safety
ATC?

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Origins of Safety 2: *A Tale of Two Stories,* 1998

insights… come from exploring the second story that lies behind the incidents that provoke attention. In each case…

• The work is painstaking and detailed.
• The story is complex, difficult for outsiders to understand, and not easily reduced to a simple summary.
• The research methods used are unfamiliar to many.
• The motivation for the work was to understand the nature of the real processes that underlie success and failure in the real world.

p.36 underline added

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Thank you for your attention.