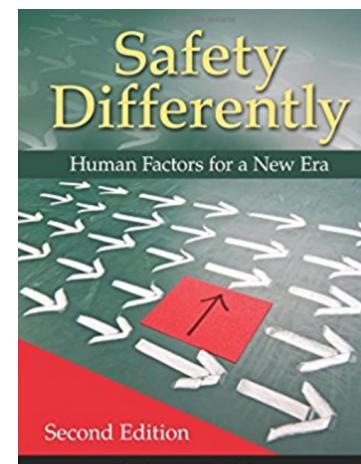
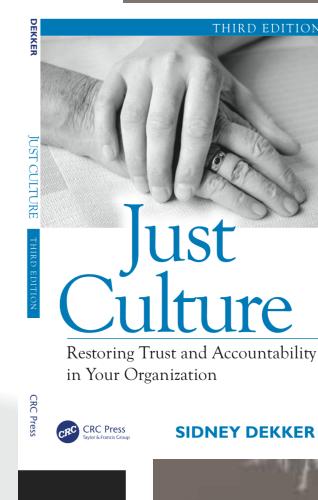
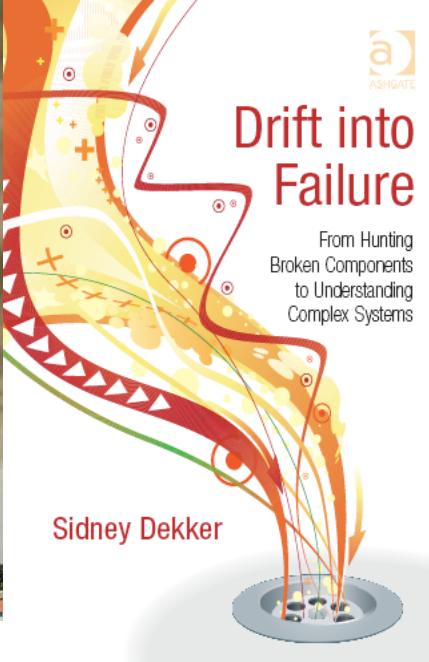
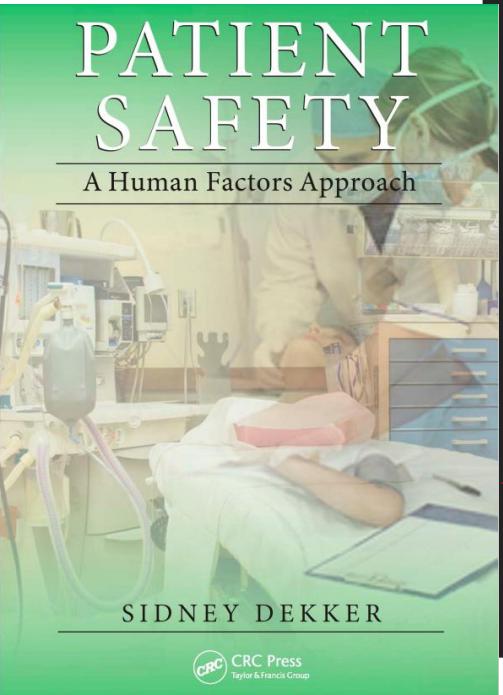
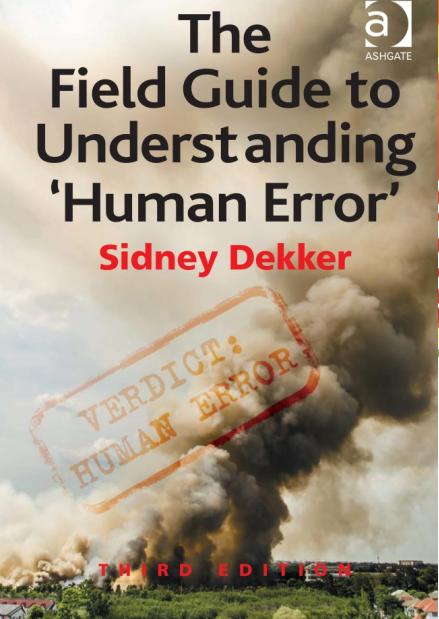

**Professor Sidney Dekker, MA, MSc, PhD
Director, Safety Science Innovation Lab**

Chief Scientist, Art of Work







SAFETY DIFFERENTLY



**DAYS WORKED
WITHOUT
A C++ MISHAP**

31

HOW ARE WE DOING?

8.8.8.8 DAYS

**of Error
Free Orders!**





Photo By Marie D. De Jesus/Houston Chronicle

◀ 4 of 5 ▶

Randall Clements, left, plant manager of DuPont facility in LaPorte and DuPont spokesman Aaron Woods, right, walk out the plant to speak to the media about the a gas release that killed four employees. Saturday, Nov. 15, 2014.



**THIS IS A
VELOCIRAPTOR-FREE
WORKPLACE**



IT HAS PROUDLY BEEN

23,740,703,486

DAYS SINCE THE LAST
INCIDENT

This is a velociraptor-free workplace



It has proudly been

days since the last
velociraptor related
incident!

Table 1
Correlation of Major U.S. Jet
Air Carrier¹ Nonfatal Accident/Incident
Rates and Passenger-mortality Risk,
Jan. 1, 1990–March 31, 1996

Type of Nonfatal Event	Correlation ²
Incidents Only	-0.10
Incidents and Accidents ³	-0.21
Accidents Only	-0.29
Serious Accidents Only ⁴	-0.34

¹ The U.S. Federal Aviation Administration defines "major air carrier" as an air carrier certified under U.S. Federal Aviation Regulations Part 121 or Part 127 and with annual operating revenues greater than US\$1 billion.

² Values shown are the coefficients of correlation between the accident/incident rate per 100,000 departures and the mortality risk per randomly chosen nonstop flight (i.e., the Q-statistic).

³ The U.S. National Transportation Safety Board (NTSB) in 1996 defined "accident" as "an event involving serious injury, loss of life or substantial aircraft damage."

⁴ NTSB in 1996 said that accidents in the "serious accident" category "exclude turbulence[-related accidents and] other minor accidents in flight, and gate or ramp accidents."

Sources: Arnold Barnett and Alexander Wang

Table 1 shows correlations of nonfatal accidents/incidents per 100,000 departures for individual major carriers with their passenger-mortality risks, as measured by Q-statistics.

All the correlation coefficients shown in Table 1 are negative, which means that carriers with higher rates of nonfatal accidents/incidents had lower mortality risks. Furthermore, the correlations shown become increasingly negative as the events become more severe — from -0.10 for incidents only to -0.34 for serious accidents only.¹⁵



A close-up photograph of an intravenous (IV) drip set. The clear plastic bag containing the fluid hangs at the top, connected by a tube to a metal drip chamber. A small blue cap is attached to the tube near the drip chamber. Below the drip chamber, a clear plastic tube with a small blue cap at the end hangs down. The background is blurred, showing a hospital hallway with other equipment and possibly a person in the distance.

1 in 13

In 1 that goes wrong

Human errors

Guidelines not followed

Communication failures

Miscalculations

Procedural violations



**"Figure out what happened to the
last crew here, and tell the next
crew not to do that."**



THE WAR ON ERROR

THERE'S
ANOTHER
ONE...



**I HAVE NO IDEA
HOW TO DO YOUR JOB**

**BUT MY BOOK SAYS
YOU'RE DOING IT WRONG**

In 12 that go right

Human errors

Guidelines not followed

Communication failures

Miscalculations

Procedural violations

Not in what people weren't doing,
but in what they *were* doing:

- Ability to say stop
- Past success not taken as guarantee
- Diversity of opinion/dissent
- Keep discussion on risk alive

You don't want to look

Ignorant

So don't ask questions

Incompetent

So don't admit mistakes

Intrusive

So don't offer ideas

Negative

So don't critique

Psychological safety...

Shared belief that team is safe for interpersonal risk taking

Team members feel accepted and respected

High performance

High performance culture
allows the boss to hear bad news

Accountability = ability to tell
accounts

Accountability

Backward-looking accountability

Who is to blame

Forward-looking accountability

What do we do now?



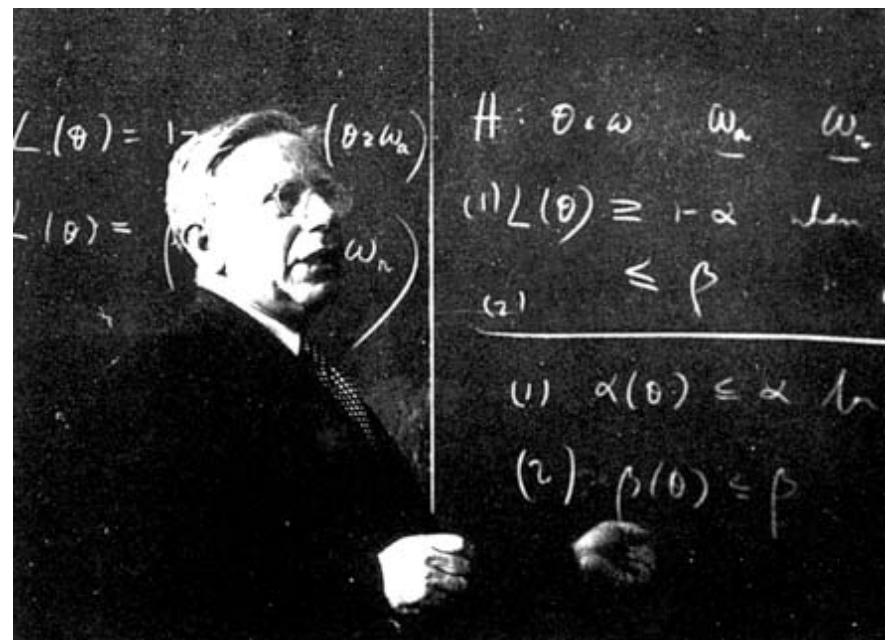
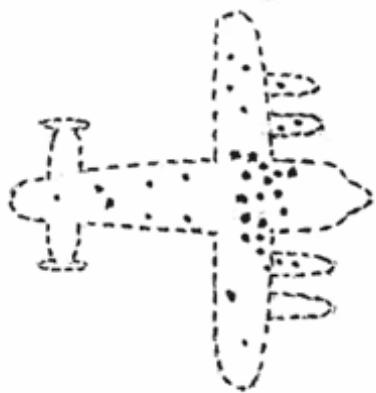
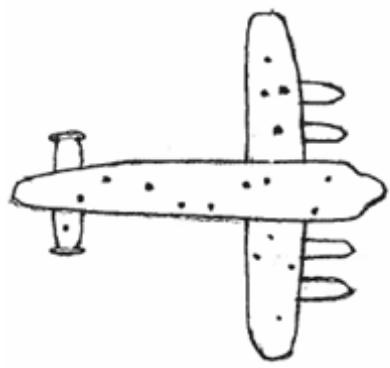




Don't just try to prevent what goes wrong



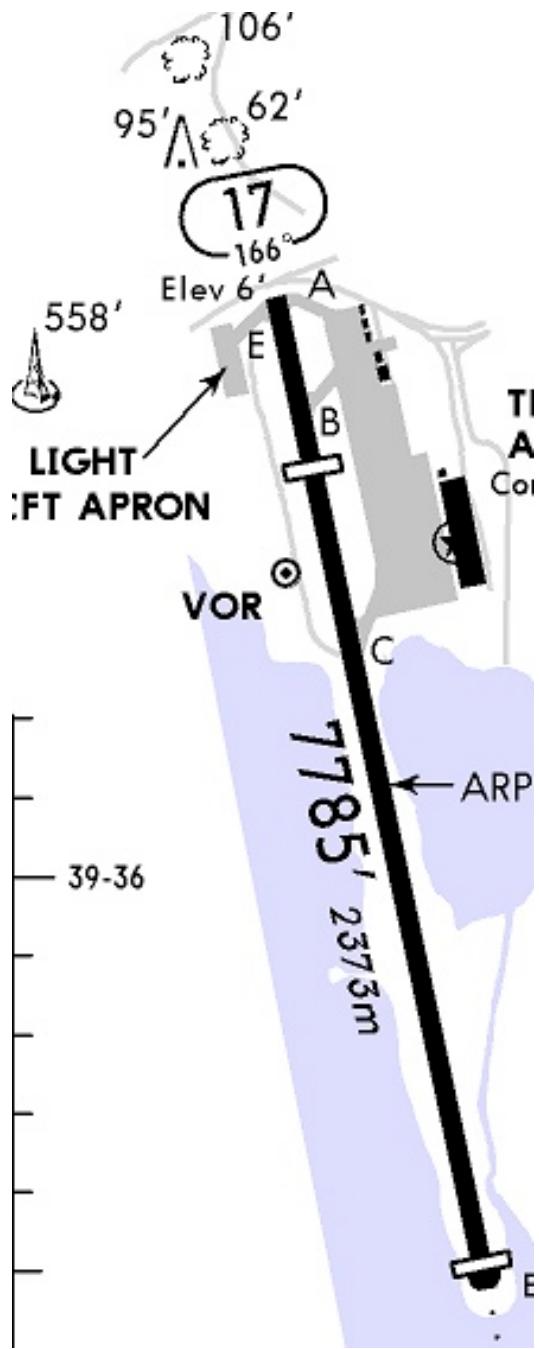
Support and enhance what goes right



Abraham Wald







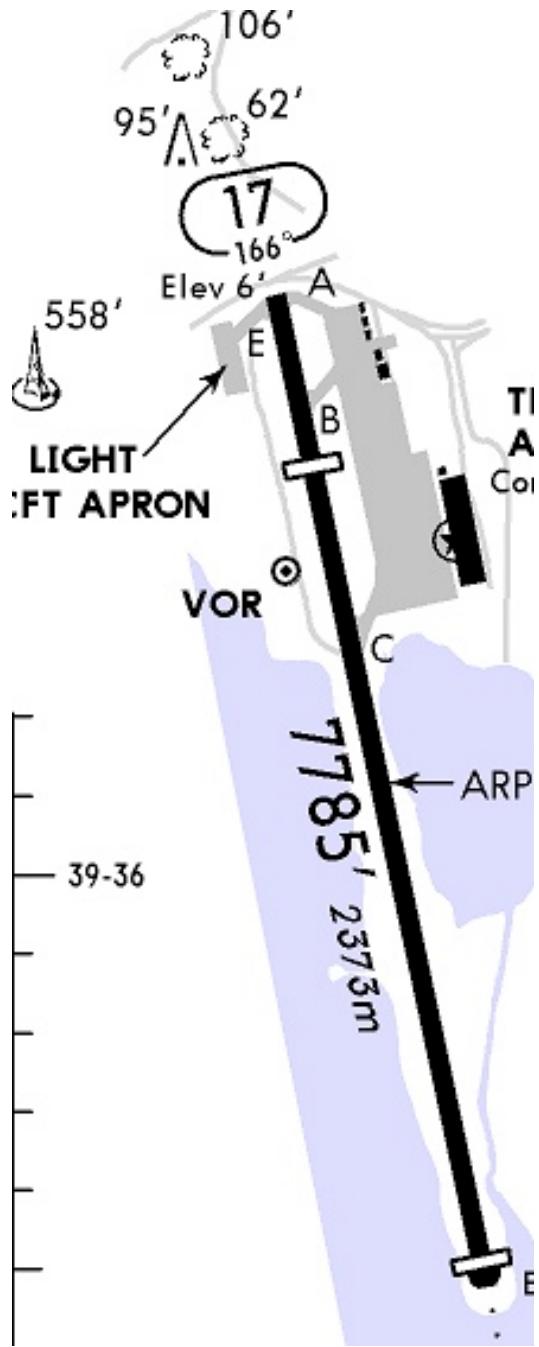


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