

The background features a large, semi-transparent watermark of the ICAO logo. The logo consists of a globe with latitude and longitude lines, flanked by two olive branches. Above the globe, the acronym 'ICAO' is written in a stylized font. The entire logo is set against a blue background with a fine grid pattern.

# The Rise and Fall of Aviation Human Factors: Shall We Stop Talking About It?

Captain Dan Maurino  
Flight Safety and Human Factors - ICAO  
Roger Green Memorial  
Cranfield, Farnborough, England  
14 October 2003



**SAFETY,  
QUALITY  
ASSURANCE,  
AND THE  
SINKING OF  
THE  
LARGEST  
OFFSHORE  
OIL  
PLATFORM  
March 2001**

**For those of you  
who may be  
involved in  
safety  
management and  
project cost  
control, at  
whatever level,**

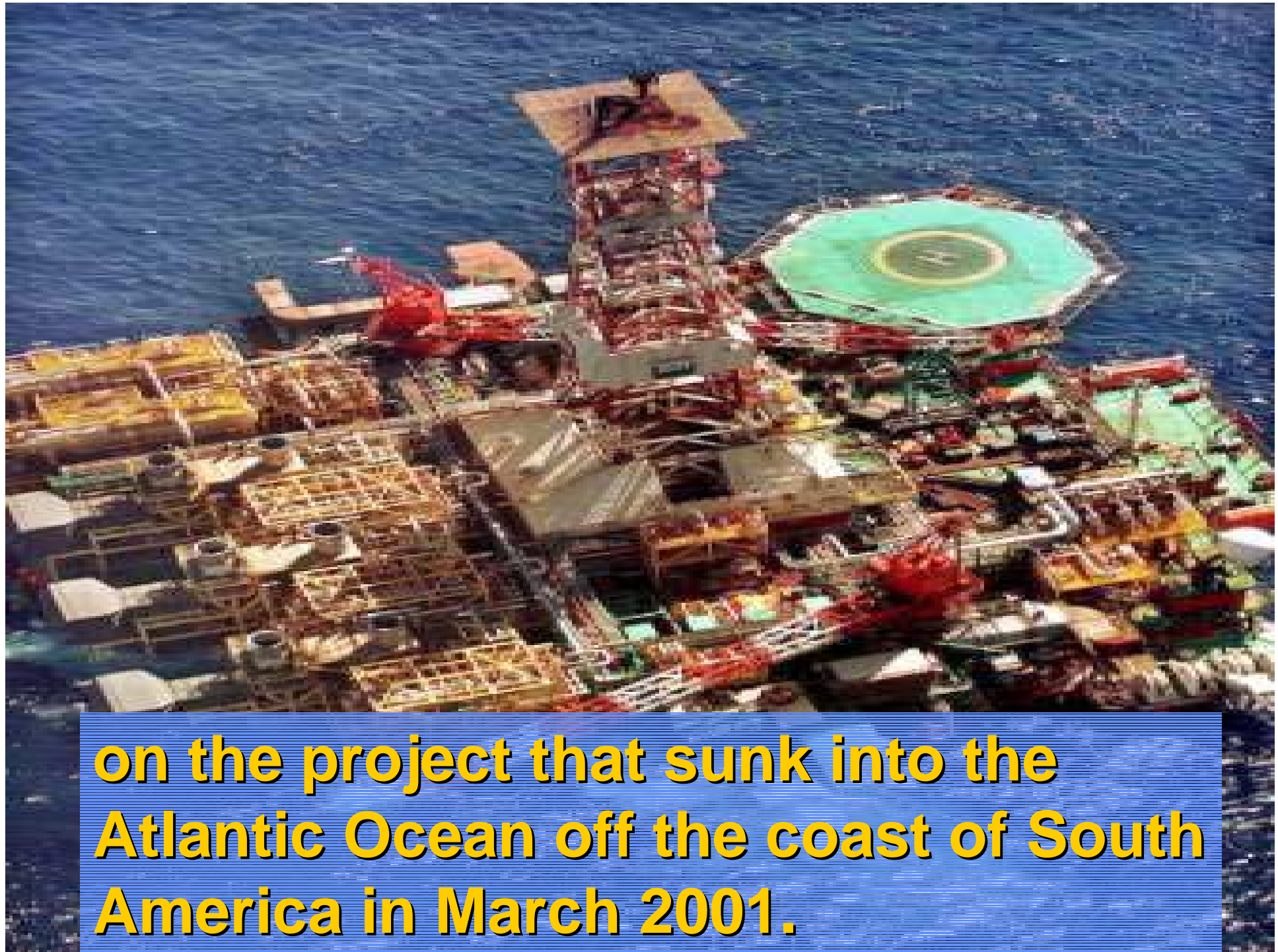


**please read this  
quote from a  
company  
executive,**



**extolling the  
benefits of  
cutting quality  
assurance and  
inspection  
costs...**





**on the project that sunk into the Atlantic Ocean off the coast of South America in March 2001.**



*"The company has established new global benchmarks for the generation of exceptional shareholder wealth..."*





*Conventional constraints have  
been successfully challenged...*



*...and replaced with new paradigms  
appropriate to the globalised  
corporate market place.*





*Through an integrated network of facilitated workshops...*

*...the project successfully rejected the established constricting and negative influences of prescriptive engineering...*



*...onerous quality requirements, and outdated concepts of inspection and client control.*





*Elimination of these unnecessary straitjackets has empowered the project's suppliers and contractors to propose highly economical solutions...*




*...with the win-win bonus of enhanced profitability margins for themselves.*




*The new platform shows the  
shape of things to come...*



An aerial photograph of a vast, deep blue ocean. In the upper left quadrant, a small, brightly colored boat is visible, appearing as a tiny speck against the immense expanse of water. The water's surface is textured with small, rhythmic waves. The overall scene conveys a sense of isolation and scale.

*...in the unregulated global market economy of the 21st Century."*

An aerial photograph showing a large-scale oil spill cleanup operation in the open ocean. Several large, orange and white containment booms are visible, forming a rectangular perimeter around a dark, oily slick. A red and white tugboat is positioned near the booms, likely managing the containment effort. The water is a deep blue, and the overall scene depicts a significant environmental remediation project.

**And now you have seen the  
final result of this proud  
achievement,**

## QUIZ:

1. How many lives were lost to this cost saving effort and how did this impact the environment, needlessly?
2. How much did the company *really* save?
3. Does *your* company have a cost saving effort? *If so, you'd better learn how to swim.*

# Question Worth Pondering

What can Human Factors do to prevent these phenomenal blunders?

- Nothing
- Rien
- Nada
- Niente

# Answer Worth Pursuing

- Production
- Protection
- Socio-technical production systems migrating towards their limits
  - ✓ Safety management systems integrated within daily business processes and practices

# A Love Affair with Buzzwords

- CRM/LOFT
- CFIT
- ALAR
- CNS/ATM
- RVSM/RNP
- LOSA/NOSS

- TEM
- ETOPS
- MNPS
- GPWS/EGPWS
- TAWS
- ETC.

## ➤ Safety Culture

- ✓ Basic, sound business management principles

## ➤ Human Factors

# Roger's Insightful Perspective

*"Human Factors is a strange and possibly ungrammatical name for a discipline or study."*

Roger Green, *circa* 1990



# Prescription Without Diagnosis = Malpractice

What is the **safety concern(s) in aviation** for which the integration of HF knowledge is a solution?

- ✓ The mis-management of adverse events resulting from unanticipated interactions between people, technology & organizations



# A Third Question Worth Pondering

After so many years of Human Factors, how successful has aviation been in dealing with operational errors?

➤ We don't know

✓ People continue to mis-manage minor occurrences or non-routine situations into larger trouble

# Our Beliefs About Safety

## Rounding up the usual suspects

- In aviation, safety is first
- Safety is everybody's responsibility
- If ain't broke, why fix it?
- If you believe safety is expensive, try an accident (*"going by the book"*)
- 70% accidents are due to human error

# What We Think About Error

The beatings will continue until moral improves

- Technology, training and regulations
- Discipline
- Punishment

# When Tokenism Creates History

- Safety, a universal value
  - ✓ Risks & safety are in the eyes of the beholder
- Empirical paradigm
  - ✓ Reactive storehouse of storytelling
- Analytical paradigm
  - ✓ The odyssey of CRM
- **Understand or endorse safety?...**

# People & Safety: A Paradigm Evolution

Accidents are failures by individuals



*Accidents are failures in organizations*

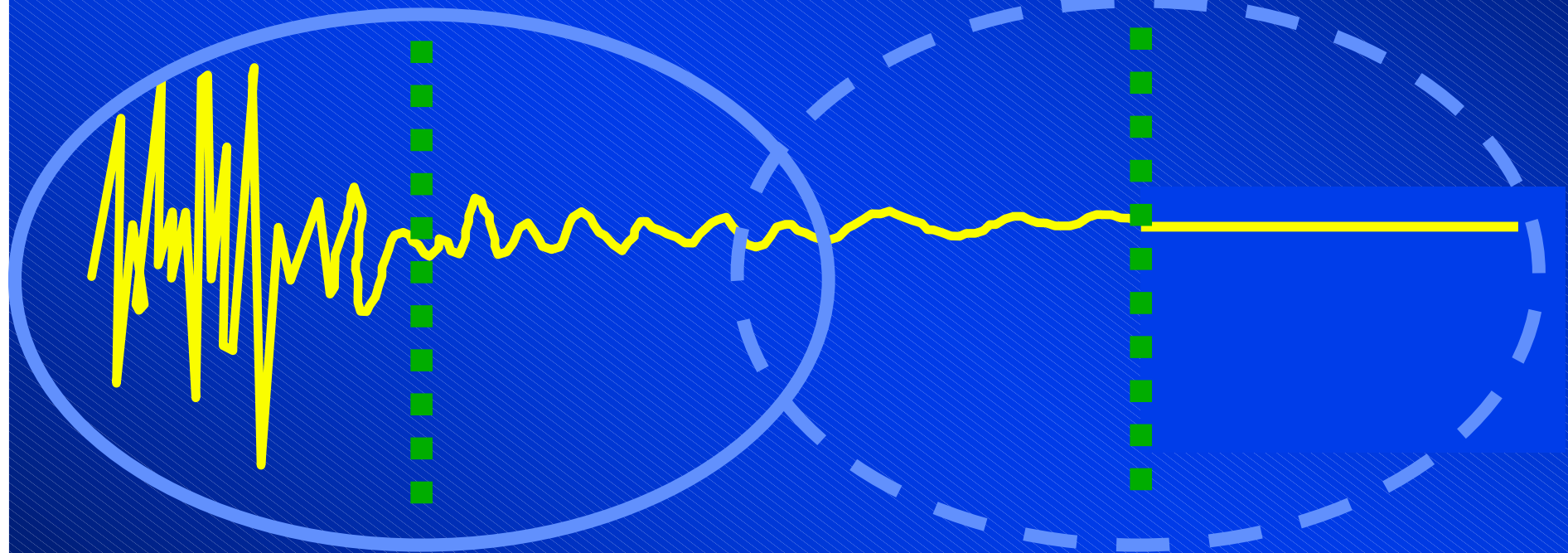
*Accidents are failures of cognitive compromises*

# Understanding Cognition in the Wild

Crisis

Operation

Design

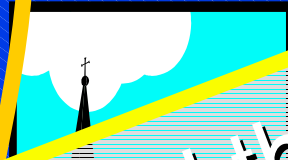
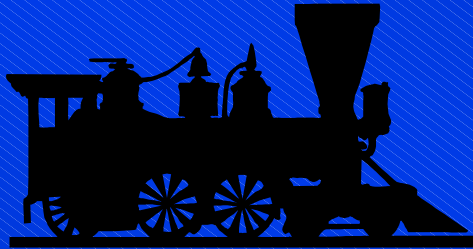


Expert operating  
zone

Regulatory operating  
zone



**B**



Understand the  
Operational Context  
Within which  
Human Performance  
Takes Place



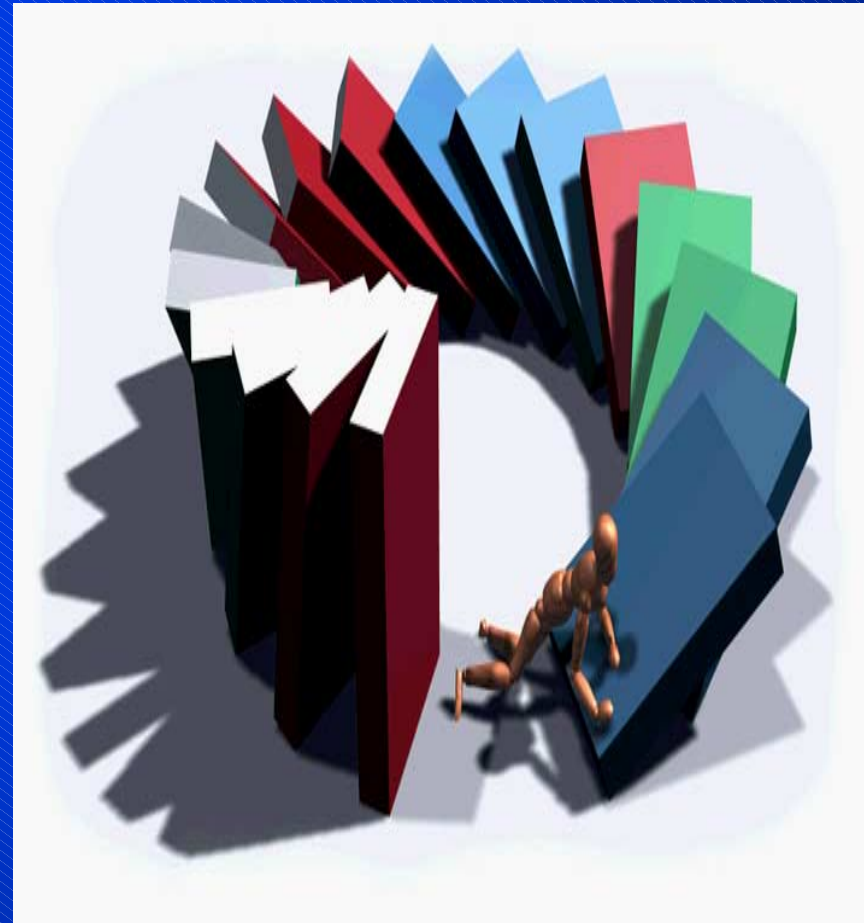
**A**

# Opaque Causality

Direct & linear

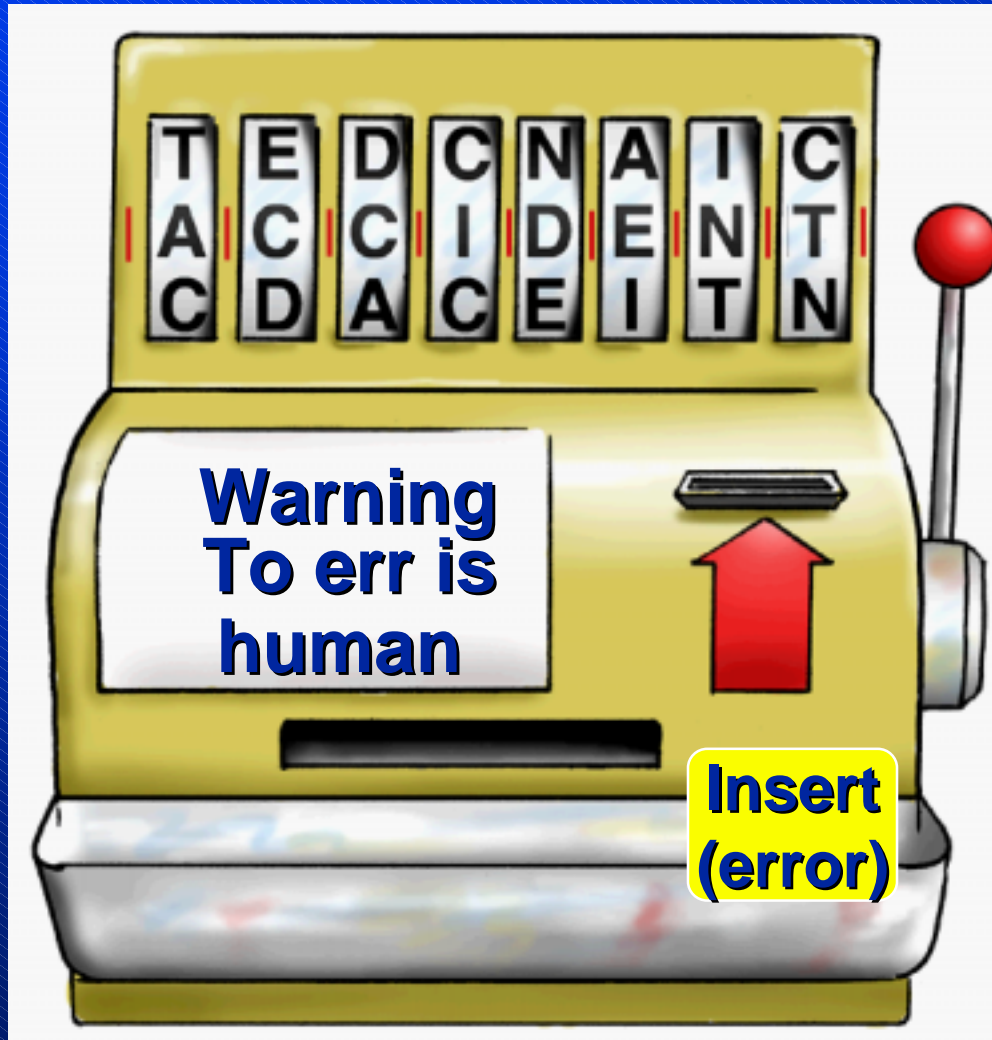


Circular & random

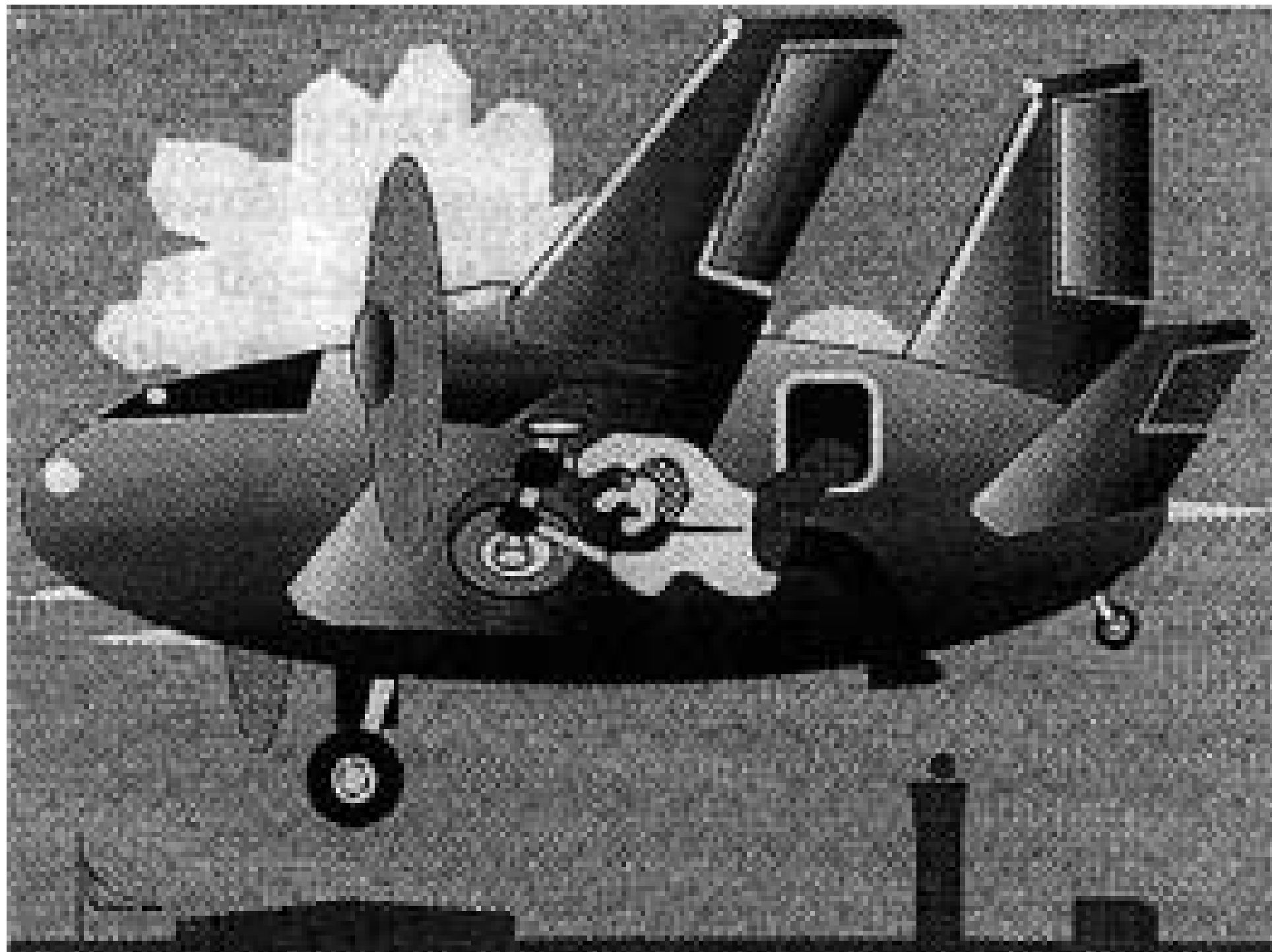




# Aviation: An Open System



Unanticipated disturbances:  
Present-day operational contexts cannot be entirely pre-specified



# Shades of Grey

## Managing the system at the edge

- ✓ Greatest threats to safety: unfamiliar, unanticipated events
- ✓ Past has limited value; predictions are difficult
- ✓ People do not, cannot *[and probably should not]* follow prescriptions of normative approaches
- ✓ Human operational performance is a reflection of the work environment

# A Choice Ours to Make

## Perpetuate historical straight jackets

- The one best way
- Reinforce stereotypes
- Tell people not to make errors

## Understand cognitive compromises

- ✓ Normal work situations
- ✓ What people really do
- ✓ Tell people what to do after they make errors

# All Roads Do Not Lead To Rome

Furthering the aviation system's health

- Normative/prescriptive approaches
- Behavioural stereotypes
- Regulatory straight jackets
- Motherhood statements
  - ✓ Dubious future/predictable failure
  - Dangers of stretching research

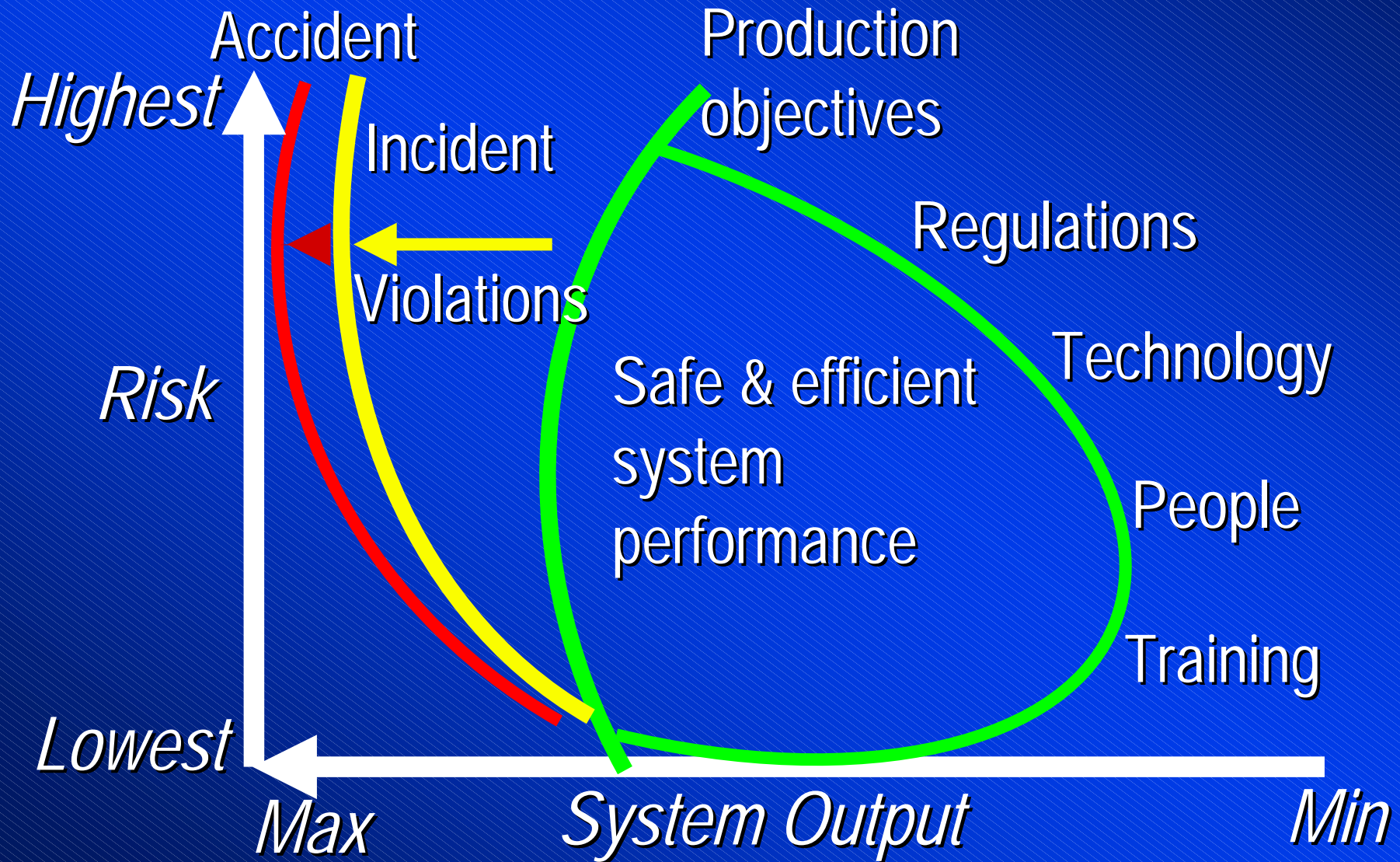


# Some Roads Do Lead To Rome

Furthering the aviation system's health

- Adaptive approaches
- Applied cognition
- Flexible regulation
- Sound business management practices
  - ✓ Good fighting chance
    - People & safety: liability or asset?

# The Message of Violations



# THE COMPLETE Safety Plan

IDIOTS  
RULE!

THIS IS A  
PARODY  
YOU IDIOT!



# FOR DUMMIES

1ST EDITION

Critics say:

*"Mind numbing!"*

*"Duncical!"*

*"Lowbrow!"*

Finally, the one How-To book that eliminates the need for all those other How-To books!

by Thomas Dolt PhD  
and Ian Dullard PhD

Forewards by  
Dan Quail

*The Fun and Easy Way  
to Achieve  
Total Stupidity*

*Don't Be Left Out  
of the Dumbing  
Down of America*

*The Book that IS  
the Lowest Common  
Denominator*

*Impress Your  
Stupid Friends*





# Shall We Stop Talking About Human Factors?

- Aviation cannot be entirely specified
- Humans will inevitably make errors
- Flexible normative framework
- Real-time implementation of the framework
- Deviation management
  - ✓ *Danger: loss of control of the deviation management process rather than deviations themselves*

Dr. Assad Kotaite, President, ICAO Council  
International Civil Aviation Day, 7 December 1999