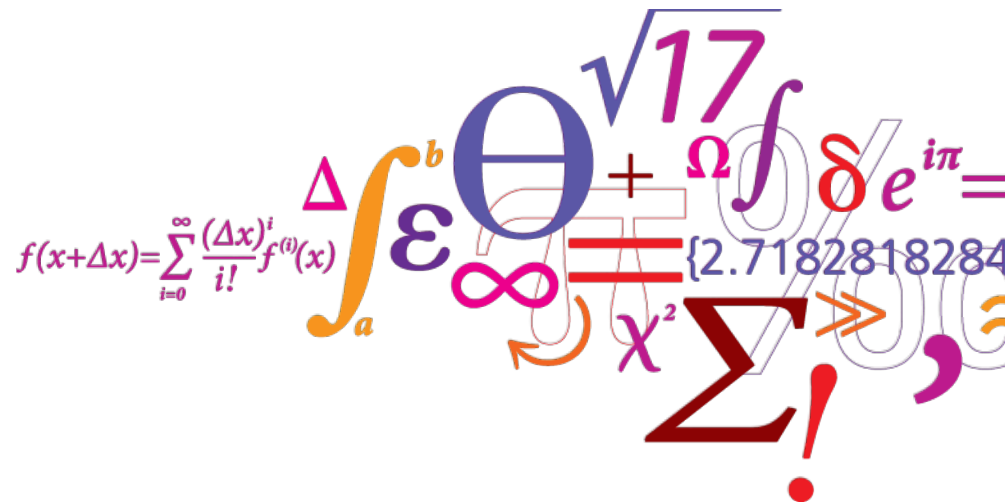


Risk research at Gazprom

31 October 2013

Deputy Head of Department
Birte Holst Jørgensen



Programme of the day

9.00-9.15	Welcome by Deputy Head of Department Birte Holst Jørgensen
9.15-9.30	About safety research by Senior Researcher Igor Kozine, DTU Management Engineering
9.30-10.00	Presentation by Deputy Director of GAZECONOMIKA A. Kazak
10.00-10.15	Break (preparing for web broadcasting)
10.15-11.15	Presentation of research by Prof. V. Lesnykh, Centre for Risk Analysis
11.15-12.00	Presentation of research by Senior Researcher Nijs. J. Diujm, DTU Management Engineering

More than 500 years of diplomatic relations between Denmark and Russia



- State visit to Russia September 2011



- Also visit to the Princess of Denmark and Empress Consort of Russia Dagmar's grave, reburied in 2006 in St. Peterburg

Energy – a common concern



- Affordable, secure, sustainable and safe energy for all
- The Nord Stream pipeline built by Gazprom – Denmark became the first country to approve the route of the pipe-line, October 2009
- Signing of bilateral documents during visit of President Medvedjev to Denmark 26 April 2011, a.o.
 - MoU on cooperation in energy efficiency and renewable energy between agencies of Russia and Denmark
 - Lol between Gazprom Export, Gazprom Marketing & Trading and DONG Energy

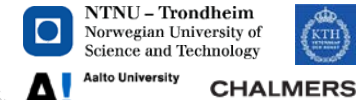
Network for key stakeholders within energy efficiency in Russia and Denmark



An international technical elite university

Alliances and strategic partners

NORDIC FIVE TECH



> 250 exchange partners



Partnerships



DTU Mission

*To develop and create value
using the natural sciences and
the technical sciences to benefit
society.*

HC Ørsted 1829

Education

Innovation

Public and
private sector
services

Research

DTU: A nationwide university



- 3 university campuses:
Lyngby, Risø & Ballerup
- 8 research stations
- 2 science parks
- 1 research vessel
- 1 Arctic educational center

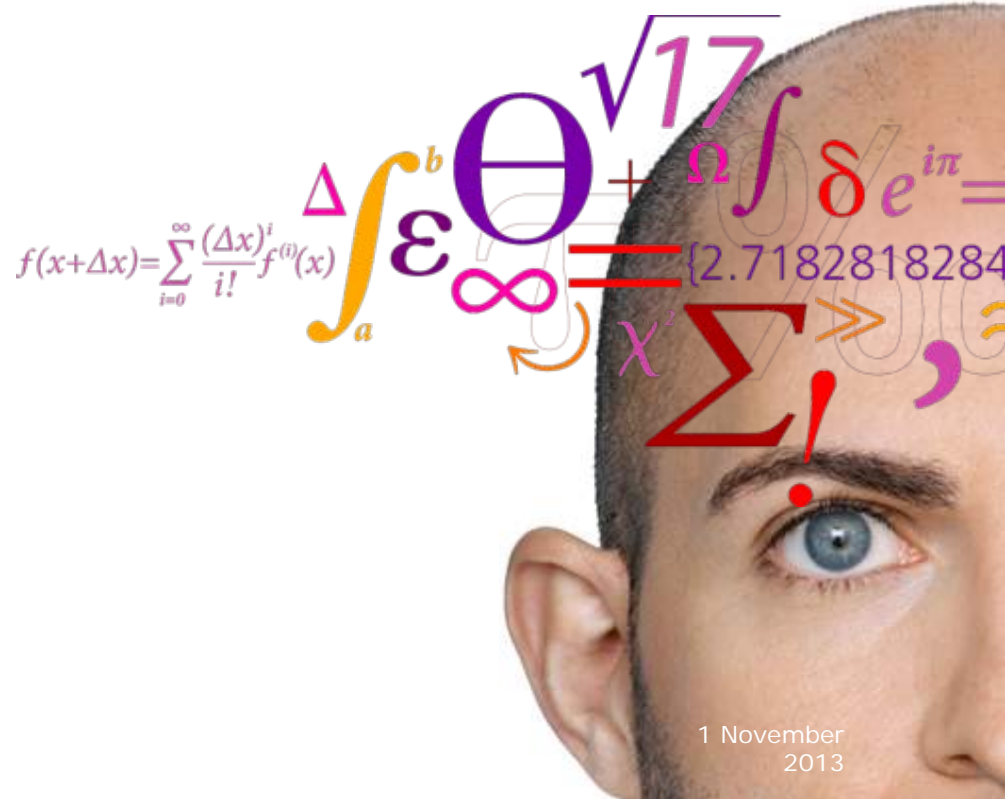
DTU Management Engineering: A New Department at DTU

- Established 1 January 2012
- As a 'generic' department
 - i.e. a department delivering knowledge on systems, production and management of relevance for the engineering profession to all technical domains at DTU.
 - i.e. generic safety and risk research in different application areas such as hospitals, railways, offshore platforms and large infrastructures



About risk and safety research

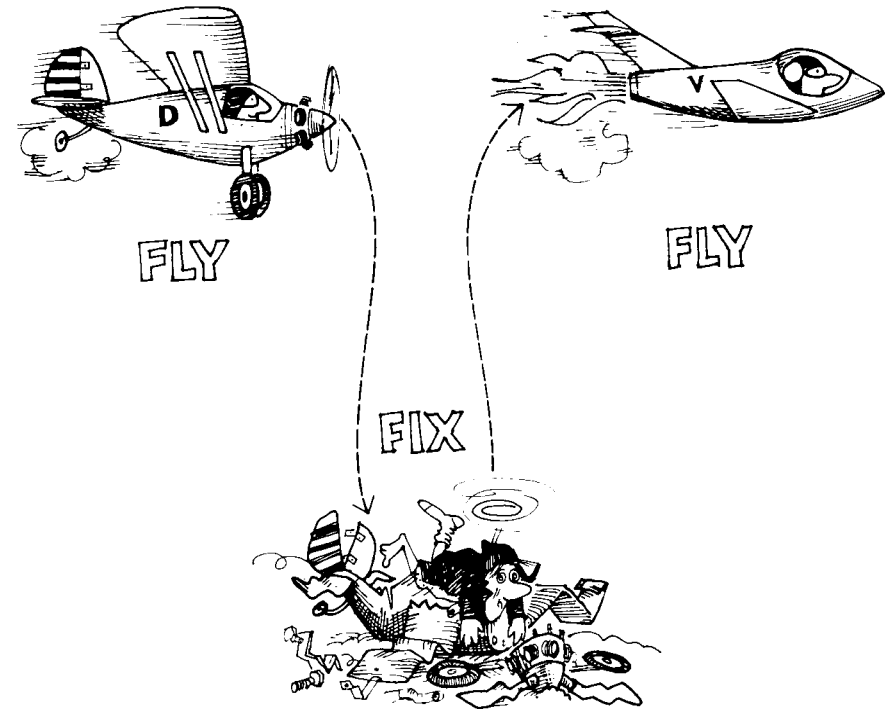
Senior Researcher Igor Kozine
DTU Management Engineering



System safety and risk management milestones

Prior to the **1940s** designers relied on a trial-and-error methodology called in aviation the “fly-fix-fly” approach.

This approach was not acceptable for certain programs such as nuclear weapons and space travel.



Milestones (continued)

Late 40ties – early 60ties: a need for an **ahead-looking accident prevention approach** is realised. System safety and risk concepts started being developed

60ties – late 70ties: maturity of the concepts, **explosive development of models and approaches**. Focus is on the physical parts of safety-critical systems

Early 80ties – late 90ties: **human factors** are recognised as main causes of a majority of accidents. Human reliability models are being developed and mature

Milestones (continued)

Early 90ties: a great influence of **organisational factors** on system safety is realised (the way people are treated, rewarded, trained, educated, rules enforced, etc.)

From 2005: Experience from lessons learned is revised, **the social dimension and communication** of risk is brought into focus, a new integrated framework is being established: The Risk Governance Framework.

Risk is everywhere

We neither know nor understand everything, and we cannot control everything. Though, we want to the degree possible predict hazards, rank them with regard to the risks and introduce risk reduction measures.



Thank you for your attention