

Improving future safety and risk
governance by:

Learning from Large Accidents

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I begin with two quotes

While there is some controversy over the exact wording, and whether they originated with George Santayana and/or Edmond Burke, clearly these observations are relevant to this afternoon's session:

“Those who cannot remember the past are condemned to repeat it.”

“Those who fail to learn from the mistakes of their predecessors are destined to repeat them.”

In some fields...

... well developed institutions designed to learn from past mistakes and accidents have operated for many years.

One of the best examples is the US National Transportation Safety Board (and similar organizations in other countries).

When an airline accident happens, NTSB investigators use a variety of techniques to determine the cause(s).

Once that has been determined, relevant corrective technical and operational measures are taken to avoid similar accidents in the future.



One strength of the NTSB process...

...is that it operates independently of legal arguments about who is to blame and who should be liable.

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Loss of Thrust in Both Engines After Encountering a Flock of
Birds and Subsequent Ditching on the Hudson River
US Airways Flight 1549
Airbus A320-214, N106US
Weehawken, New Jersey
January 15, 2009



Accident Report

NTSB/AAR-10/03
PB2010-910403



National
Transportation
Safety Board

This approach stands in contrast to other accident situations in which legal arguments about blame and liability seriously complicate efforts to understand what actually went wrong.

**Need 1: Independent
impartial institutions that can
learn what went wrong.**

For many decades...

...in the nineteenth century, the US was plagued by exploding boilers on steam boats.



Explosion of the Sultana, 1856
Image from www.decodedstuff.com

Bursting Boilers and the Federal Power

JOHN G. BURKE

I

When the United States Food and Drug Administration removes thousands of tins of tuna from supermarket shelves to prevent possible food poisoning, when the Civil Aeronautics Board restricts the speed of certain jets until modifications are completed, or when the Interstate Commerce Commission institutes safety checks of interstate motor carriers, the federal government is expressing its power to regulate dangerous processes or products in interstate commerce. Although particular interests may take issue with a regulatory agency about restrictions placed upon certain products or seek to alleviate what they consider to be unjust directives, few citizens would argue that government regulation of this type constitutes a serious invasion of private property rights.¹

Though federal regulatory agencies may contribute to the general welfare, they are not expressly sanctioned by any provisions of the U.S. Constitution. In fact, their genesis was due to a marked change in the attitude of many early nineteenth-century Americans who insisted that the federal government exercise its power in a positive way in an area that was non-existent when the Constitution was enacted. At the time, commercial, manufacturing, and business interests were willing to seek the aid of government in such matters as patent rights, land grants, or protective tariffs, but they opposed any action that might smack of governmental interference or control of their internal affairs. The government might act benevolently but never restrictively.

The innovation responsible for the changed attitude toward government regulation was the steam engine. The introduction of steam power

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¹ See, e.g., Report on Practices and Procedures of Governmental Control, Sept. 18, 1944 (House of Representatives document 678, ser. 13873 [Washington: 78th Congress, 2d session]), p. 3, where it is stated: "Regulation, seen through modern eyes is not a violent departure from the ways of business to which the nation is both habituated and strongly attached . . . regulation . . . enjoys, as a system, in large measure the confidence and approval of the parties concerned."

1

In a classic paper, John Burke explained that while the Congress wanted to rely on tort liability to control the problem, they finally passed legislation to mandate inspection (by the ASTM) since when a boiler exploded the operator often just went out of business and disappeared.

Need 2: A responsible organization that will be around to make improvements in the future.

Need 3: Regulation and inspection to assure that past lessons are implemented.

As you will hear...

...in several of the talks that follow, after the horrible accidents at Bhopal in India and Seveso in Italy, the chemical industry realized that they had a very serious problem that had to be addressed.



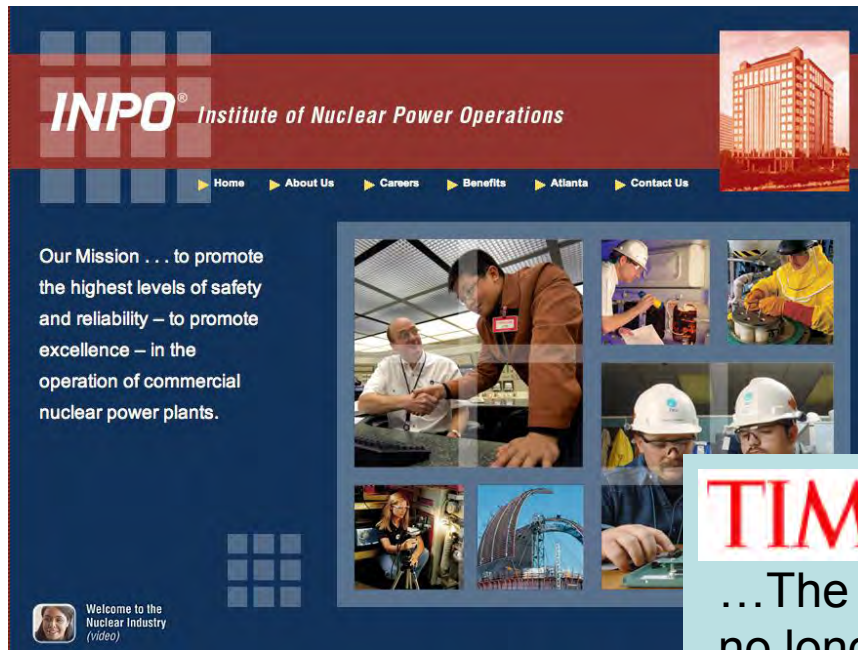
Images from redicecreations.com
and ec.europa.eu



While “responsible care” was obviously partly about PR and improving the public’s perception of the chemical industry, it also has had a major impact on making that industry safer and more responsible.



Similarly... the TMI accident led to a big change in the US nuclear industry



The screenshot shows the INPO (Institute of Nuclear Power Operations) website. The header features the INPO logo and the text "Institute of Nuclear Power Operations". Below the header is a navigation menu with links for Home, About Us, Careers, Benefits, Atlanta, and Contact Us. The main content area includes a mission statement: "Our Mission . . . to promote the highest levels of safety and reliability – to promote excellence – in the operation of commercial nuclear power plants." There are several small images showing nuclear workers in various settings, including a control room and a reactor core. A small video player is visible in the bottom left corner with the text "Welcome to the Nuclear Industry (video)".



TIME

MICHAEL GRUNWALD Friday, Mar. 27, 2009

...The good news is that today's nuclear industry is no longer dysfunctional. It's not perfect...But it has learned from its mistakes. Its reactors ran at a record 92% capacity last year. It's doing a better job of storing its radioactive waste at its plants. It has standardized designs for new reactors, which should enhance safety, and it has successfully lobbied to streamline its regulatory process, which should reduce delays...

Need 4: A realization by an industry that if it does not act aggressively to improve its safety and performance, it may not *have* a future.

We turn now to talks by:

Dr. Takashi Sawada, representative of the *Science Council of Japan (SCJ)*, Vice-president of the *Atomic Energy Society of Japan*, and director at *Mitsubishi Heavy Industries*.

Mr. Jean-Pierre Sursock, Program Director at *Electric Power Research Institute*.

Dr. Hans Wanner, Director of the *Swiss Federal Nuclear Safety Inspectorate (ENSI)* on lessons which can be learned in the Swiss context.

Mr. Richard Gowland, Technical Director of the *European Process Safety Center* in the United Kingdom, and former director at Dow Chemicals.

Dr. V.S. Arunachalam, Founding Chairman of the *Center for Study of Science, Technology and Policy (CSTEP)* and Former Science Advisor to the Government of India.

These will be followed by...

...a round table discussion with:

Prof. Wolfgang Kröger, Managing Director of the ETH Risk Center, former Director of the Laboratory for Safety Analysis/Institute for Energy Technology ETHZ.

Prof. Xue Lan, Professor and Dean, School of Public Policy and Management at Tsinghua University in Beijing (PhD Engineering and Public Policy, Carnegie Mellon University).

Prof. Ortwin Renn, Professor of environmental Sociology at Stuttgart University, member of the Spring 2011 Ethics Commission for a Safe Energy Supply for Germany.

Dr. Timothy Walker, former UK Governor of IAEA and Chairman of the EBRD Nuclear Safety.

We will end the conference...

...with some final thoughts from:

Prof. Hans Björn Püttgen, Director of the
EPFL Energy Centre.