

Willkommen
Welcome
Bienvenue
Bienvenidos



Analysis of Catastrophic Failures in Switzerland

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Civil and Mechanical Engineering

Content



- A (nostalgic) retrospect
- A (sorrowful) look at the present
- A (uncertain) look to the future

Gotthard Railway Tunnel



Start of Construction: September 1872
Start of Operation: June 1882
Cost: 135 Mio BRL
Total of Passengers: approximately 3 Mio per year



Robert Maillart (1872-1940)
Othmar Ammann (1879-1965)
Heinz Isler (1926-2009)
Giovanni Lombardi (1926)
Christian Menn (1927)



Conclusions I



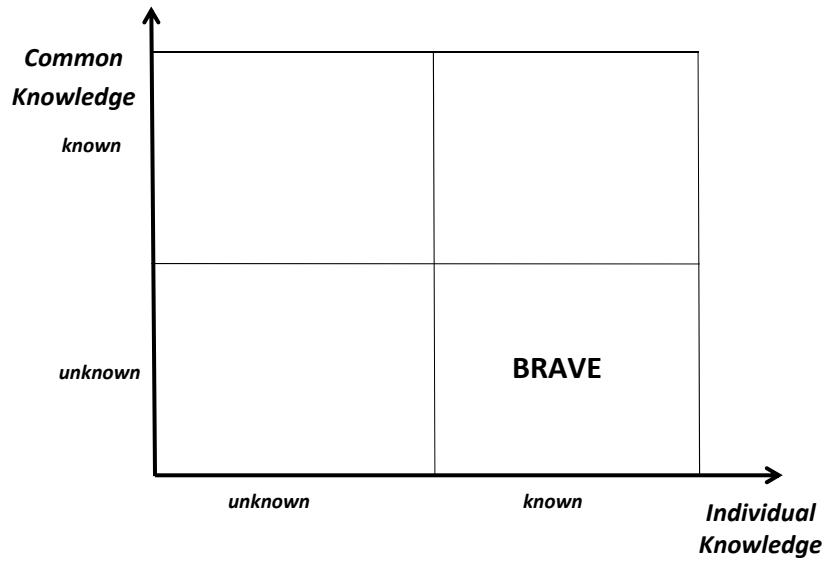
- The art of structural engineering in Switzerland was founded in the past by a number of world known engineers which have designed exceptional structures
- The high quality of life in Switzerland is also due to their achievements

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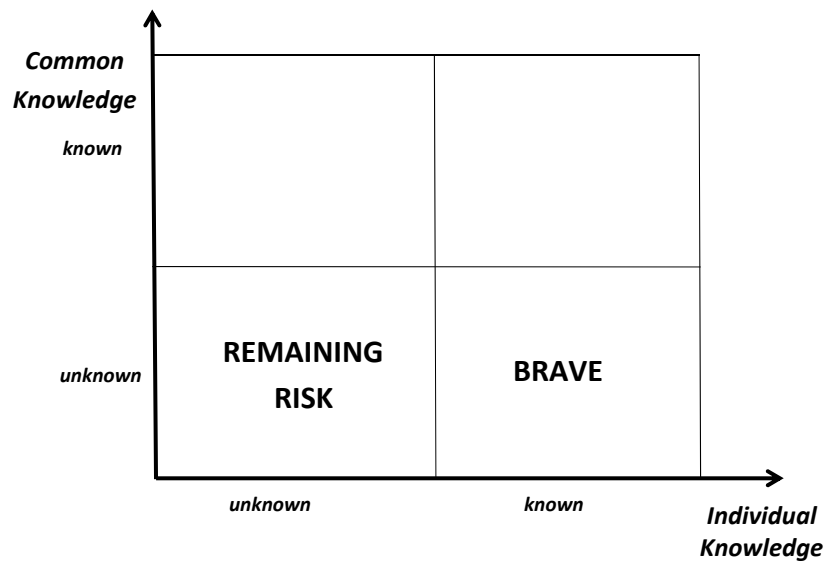
Known's and Unknown's



Known Unknowns: Piora Rift



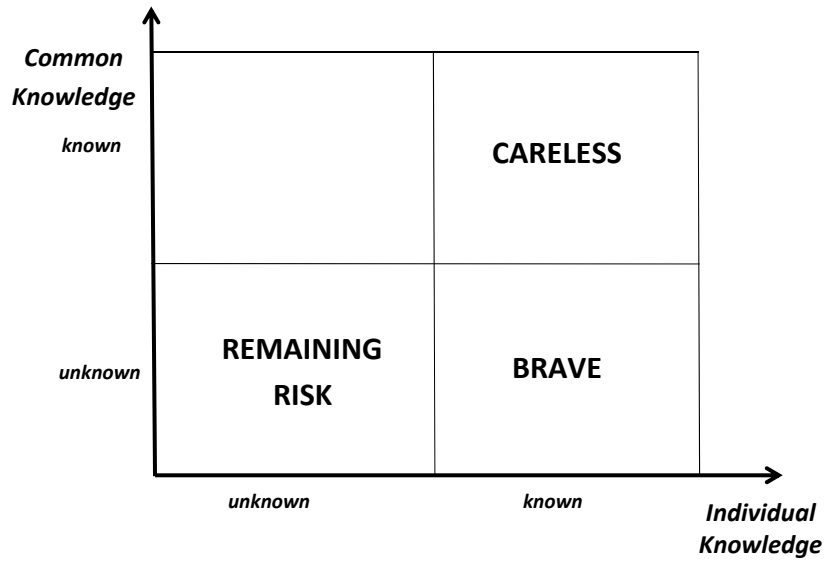
Known's and Unknown's



Unknown Unknowns: Münchenstein, 14. June 1891



Known's and Unknown's



Known Known's

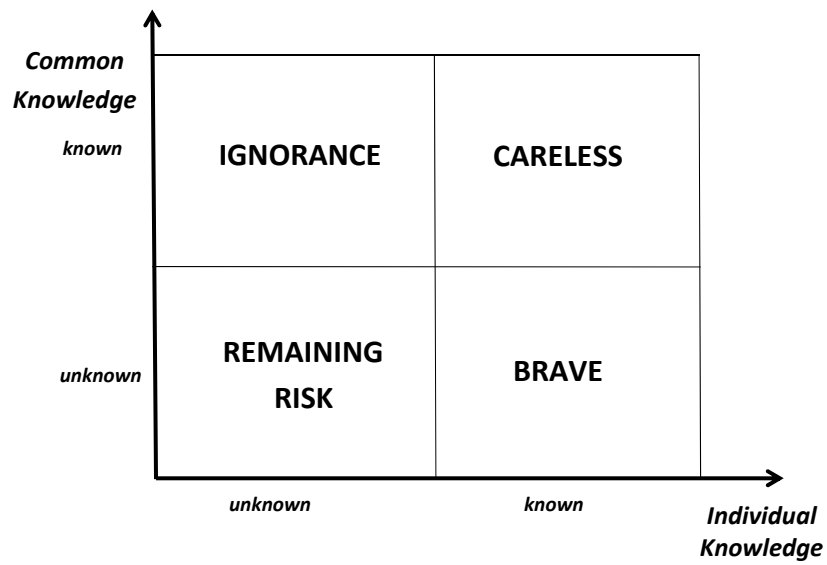
January 2010
Haiti
> 200'000
Casualties

Magnitude ≈ 7

September 2010
Neuseeland
No
Casualties



Known's and Unknown's



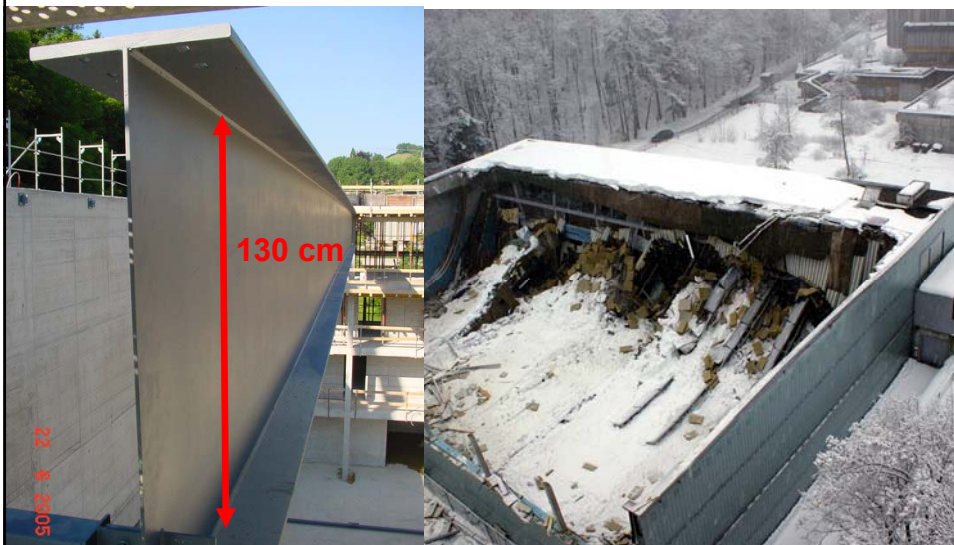
Unknown Known's: MZH Lupfig

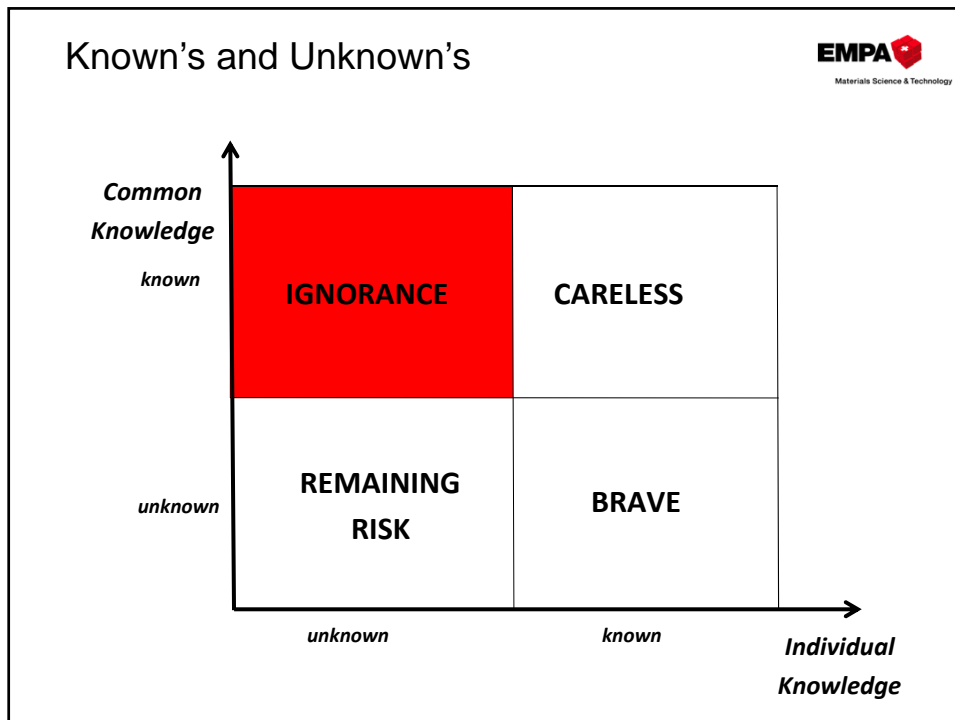


Unknown Known's: Indoor Swimming Pools 20 years after Uster



Unknown Known's: Gymnastic hall, St. Gallen





- ### An attempt for an explanation
-
- EMPA**
Materials Science & Technology
- The appreciation for engineering work has decreased over the last 30 years
 - Status in society
 - Importance of technical arguments for decision makers
 - Salaries of engineers
 - (temporary) decrease in number of students at universities
 - «Pocket-Calculator» syndrom

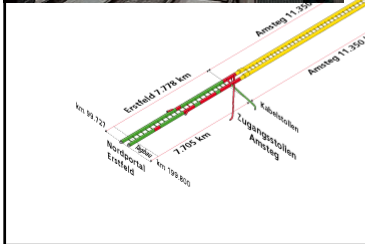
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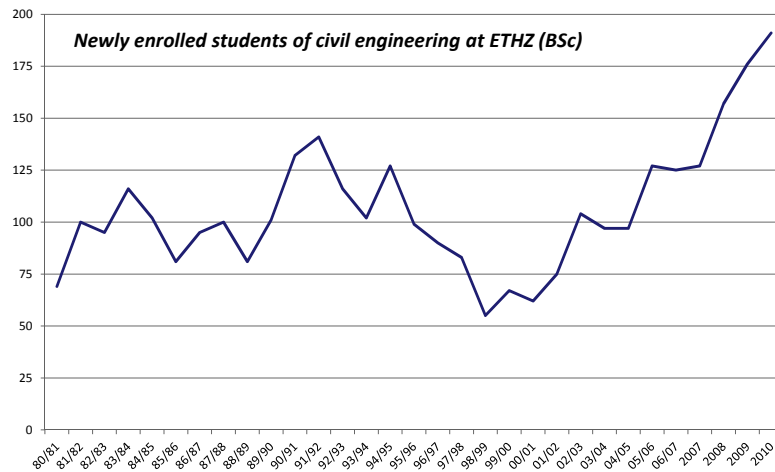
Thesis 1: We are still able to achieve unique goals

Gotthard-Basistunnel
Stand der Arbeiten, 1. Dezember 2010

- noch auszubrechende Tunnelröhren
- Ausbruch abgeschlossen
- Ausbruch und Ausbau abgeschlossen
- bereits für Eisenbahnverkehr freigegeben



Thesis 2: Young people are on our side



Thesis 3: We are not on the safe side yet



- We are facing plenty of problems which we do not even know of at the moment
- Life cycle cost calculations must become the basis of the evaluation of projects, not the short term investment costs
- The overall responsibility of a project must be with a person which has the needed technical know-how

Thesis 4: Engineers must step up



- Take responsibility
 - They have the know-how (not lawyers or politicians)
- Show self confidence
 - In public
 - In the political arena
- Create sustainable values
 - economically
 - ecologically
 - socially

Conclusions



- Quality of life and the competitiveness of a society is based on a high performing and safe infrastructure
- Civil engineers must perform at the highest level to enable this performance
- These achievements have to be honored by society