9/12/2019

The Nuclear Regulatory Commission's Public Meeting on the Draft Supplemental Environmental Impact Statement for Subsequent License Renewal of Peach Bottom Atomic Power Station, Units 2 and 3 at Peach Bottom, Delta PA

Criticisms on the use of Probability Analyses

Scott D. Portzline
Harrisburg PA
Former Three Mile Island
Alert Security Consultant

The NRC concludes that the impact of all severe nuclear accidents are small.

"For severe accidents, the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are SMALL for all plants."

NUREG-1437
Generic Environmental Impact Statement for License Renewal of Nuclear Plants
Final Report

Accidents with Radiological Consequences

Premises for License Renewal

- Probability
- Severity
- Public Impact
- Environmental Impact

Upon Examination

- The Nuclear Regulatory Commission (NRC) and Exelon are unable to provide reasonable "probability analyses" and therefore the NRC cannot complete it’s duty of a "licensing renewal."

- The NRC and Exelon do not know what the actual probabilities are.

The Re-Licensing Process is flawed

- The Dirty Math Trick
- The Favorable Data Selection
- The Need to Believe / Fantasy Land

The Re-Licensing Process is flawed

Likelihood of an Accident
1 chance in a million **(reactor years)**

Beginning in 1975, the odds of a reactor accident as reported by the NRC was calculated to be 1 chance in 1,000,000.

Reactor Safety Study
(probability risk analysis)
know as WASH 1400
aka,The Rasmussen Report

"render an area the size of Pennsylvania permanently uninhabitable." China Syndrome

then came Three Mile Island

NRC withdraws any explicit or implicit past endorsement of the Executive Summary Wash 1400

- “The executive summary does not adequately indicate the full extent of the consequences of reactor accidents and does not sufficiently emphasize the uncertainties involved in the calculations of their probability.”
- “As a result, the reader may be left with a misplaced confidence in the validity of the risk estimates.”

After it happened, the TMI Accident odds were calculated to be only 1 chance in 7.7

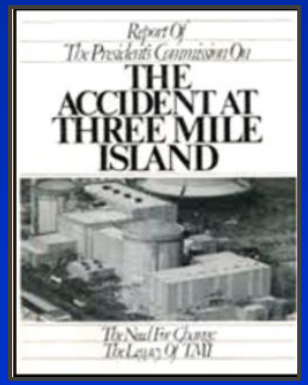

The Patriot

Radiation Being Vented; Delay in Alert Assailed

3-Mile Sealed Off

"If WASH1400 predictions of the best estimate probabilities are valid, there was a 13 percent chance of having an accident at the time of TMI-2."

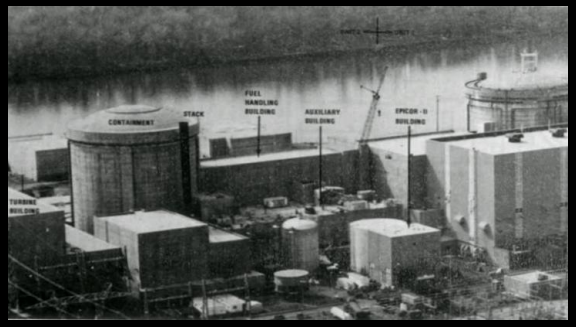
Reports of the Technical Assessment Task Force of the President's Commission on the Accident at Three Mile Island



"It is very difficult to properly apply the techniques, and few people are trained or experienced in such work"

1 chance in 7.7 = 13%

8 sided dice



Gambling

- If the NRC used its faulty accident probabilities to run a Las Vegas style casino, they would have been bankrupt in the first year.

Insurance Actuaries

Insurance actuaries know that the likelihood of a major nuclear accident occurring are too great to offer homeowners nuclear accident insurance.

Real World Accounting

There has been five major nuclear accidents in the last fifty years

- First modern US plants went online in 1969
- 1 major accident somewhere in the world every 10 years
- Probability calculation: 1 chance in 10 per year or 10%
- Closely matches the WASH 1400 analysis of 13%

The Dirty Math Trick

The NRC concludes that the impact of all severe nuclear accidents are small by using a math trick.

"For severe accidents, the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are SMALL for all plants."

NUREG-1437
Generic Environmental Impact Statement for License Renewal of Nuclear Plants
Final Report

NRC Studies Show

- The actual impacts can be severe with plans for evacuations at all US plants to prevent deaths and early cancers.
- The impact on the environment can be severe.
- The impact on the economy can be severe.

How the trick is done.

- Think of the calculations which are used to determine the probabilities as containing a hidden timeline.

If a certain sequence of malfunctions or mis-steps happen, then a set of consequences (including damaging impact) can follow.

Accident Sequence

Odds are calculated for this sequence

Example: 1 chance in 500,000 or **.000002**

How the trick is done.

Accident Sequence **.000002**

The probability for various impacts are calculated

For example .05

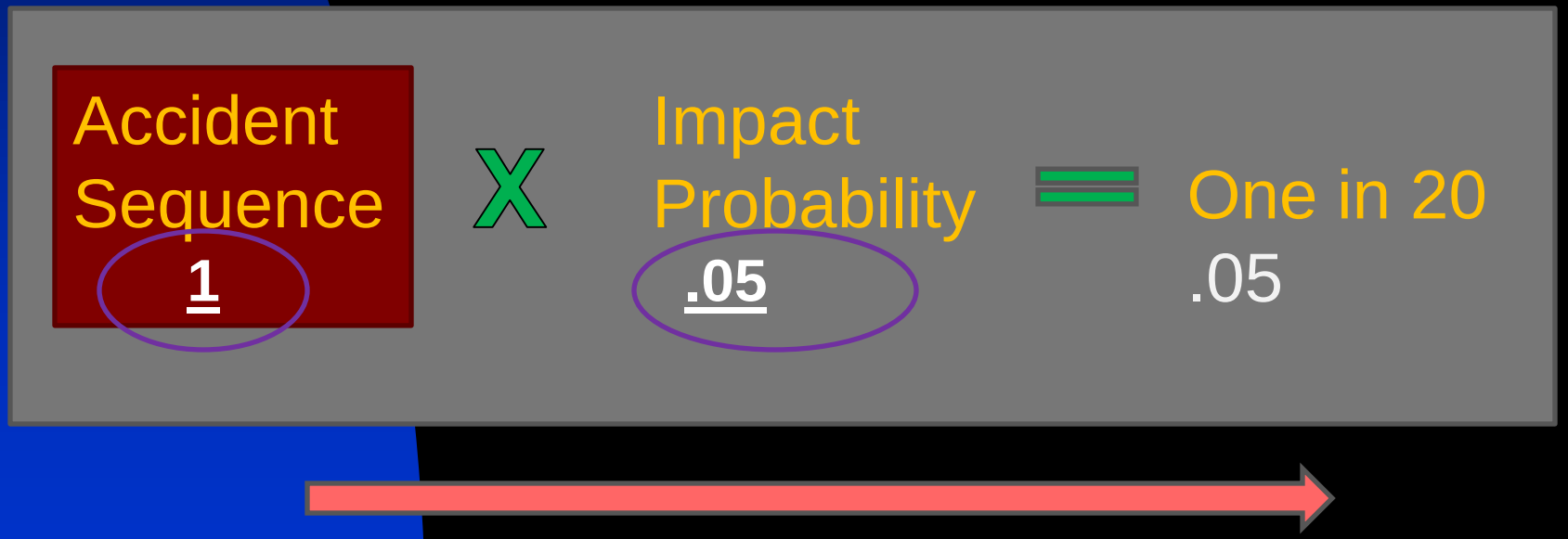
How the trick is done.

Multiply these two values

Accident Sequence		Impact Probability		One in a Million
.000002	X	.05	=	.0000001

How the trick is done.

But once you have the accident (think of the timeline), the value for the accident sequence is 1 (it's a certainty).



Severity

Unique Situation: State of the art Reactor Consequence Analysis (SOARCA) studied Peach Bottom accident progressions and consequences with the newest computer simulation capabilities from Sandia National Laboratories.

Fox News Headline 2/2/2012

Nuclear accidents pose little risk to health, NRC says

Published February 02, 2012 / Reuters

U.S. NUCLEAR REGULATORY COMMISSION

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The risk to public health from a severe nuclear power plant accident in the United States is "very small" because reactor operators should have time to prevent core damage and reduce the release of radioactive materials, U.S. nuclear regulators said in a study on Wednesday.

Severity

SOARCA studied Peach Bottom using a computer program call **MELCOR.**

The MELCOR software has numerous shortcomings and SOARCA should caution its readers that divergent results can easily be created.

Why many differing results?
One reason is because the program uses differential equations.

The problem with differential equations is they are probabilities instead of exact values. (by nature exact values cannot be determined)

The Coming Crisis in Computational Science
Los Alamos National Laboratory

- New codes are more complex and more ambitious but not as closely coupled to experiments and theory.
- Better physics is much more important than better computer science.
- Computational science has to develop the same professional integrity as theoretical and experimental science.

Many things can be wrong with a computer generated prediction

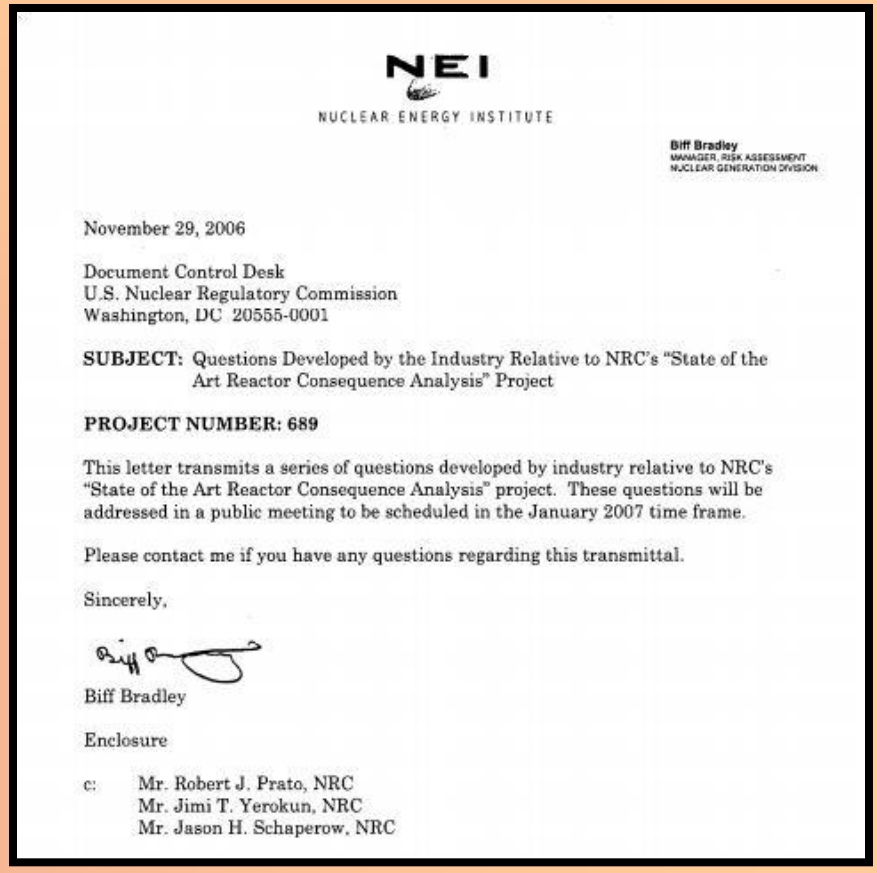
- Experimental and theoretical science are mature methodologies but, computational science is not.
- Code could have bugs in either the models or the solution methods that result in answers that are incorrect.
- Models in the code could be incomplete or not applicable to problem or have wrong data.
- User could be inexperienced, not know how to use the code correctly.

Los Alamos National Laboratory

RE: MELCOR Scenarios

#10 What if all sequences that survive the screening process are those that result in an intact containment?

Nuclear Energy Institute letter to NRC on how SOARCA will handle certain parameters - November 2006



NEI
NUCLEAR ENERGY INSTITUTE

Biff Bradley
MANAGER, RISK ASSESSMENT
NUCLEAR GENERATION DIVISION

November 29, 2006

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Questions Developed by the Industry Relative to NRC's "State of the Art Reactor Consequence Analysis" Project

PROJECT NUMBER: 689

This letter transmits a series of questions developed by industry relative to NRC's "State of the Art Reactor Consequence Analysis" project. These questions will be addressed in a public meeting to be scheduled in the January 2007 time frame.

Please contact me if you have any questions regarding this transmittal.

Sincerely,

Biff Bradley

Enclosure

c: Mr. Robert J. Prato, NRC
Mr. Jimi T. Yerokun, NRC
Mr. Jason H. Schaperow, NRC

Real-World

None of these real-world nuclear accidents, prior to its occurrence, would have been predicted, or simulated by MELCOR.

Three Mile Island – Windscale – Chernobyl - Fukushima

Fantasy Land
The Need to Believe

SOARCA is not based on reality and ignores real world data.

No Timely Evacuations

- There has never been a timely evacuation or a timely evacuation order issued at any of the world's nuclear accidents.
- 100% failure rate.
- The evacuation projections are purely wishful thinking.

Three Mile Island – Windscale – Chernobyl - Fukushima

Flooding
Unique Topography