

TMI Alert Dinner 2014

35th anniversary of the accident



Updates on:
Fukushima
Security
Three Mile Island
State of the Industry and TMIA
Online Participation

Fukushima 3-11-2011

6:20 AM I call CNN to say that the Fukushima N-plants are in big trouble and likely headed for a meltdown.

8:00 AM CNN calls back to thank me and confirms my suspicions as valid. They ask me to come to Washington DC to go “on air” and explain what is occurring at Fukushima.



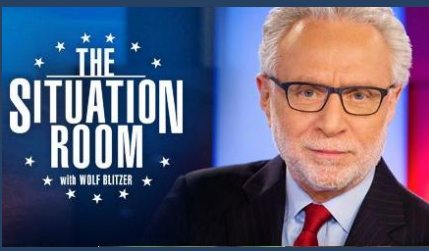
Fukushima 3-12-2011



Paul Gunter
Beyond Nuclear

Paul and I discussed the idea that a reactor would explode because of the hydrogen buildup which is undoubtedly occurring.

For the first month of the disaster, Paul Gunter, Arnie Gundersen and I updated each other, and shared photos and documents nightly.



CNN

SITUATION ROOM

Friday 5 PM

The nuclear proponents agree that “The containment, from all reports that we've heard, is intact. There hasn't been any fuel damage yet. They are cooling the core.”

Paul Gunter concludes the segment by stating, “The concern is that we could literally blow the roof off this reactor.”

Tony Pietrangelo, Nuclear Energy Institute: “That's very, very remote.”

Sidebar: Paul was scolded by the panel after the program for frightening people and for crossing the line of responsibility and credibility.

Explosion at Unit #3



A total of three reactors buildings
explode over the next four days.

Note the red glow seen through the destroyed roof at Unit #1.



Appears very similar to images of glowing fuel at the Chernobyl flyover.

March 11, 2014

Former Japanese Prime
Minister Naoto Kan



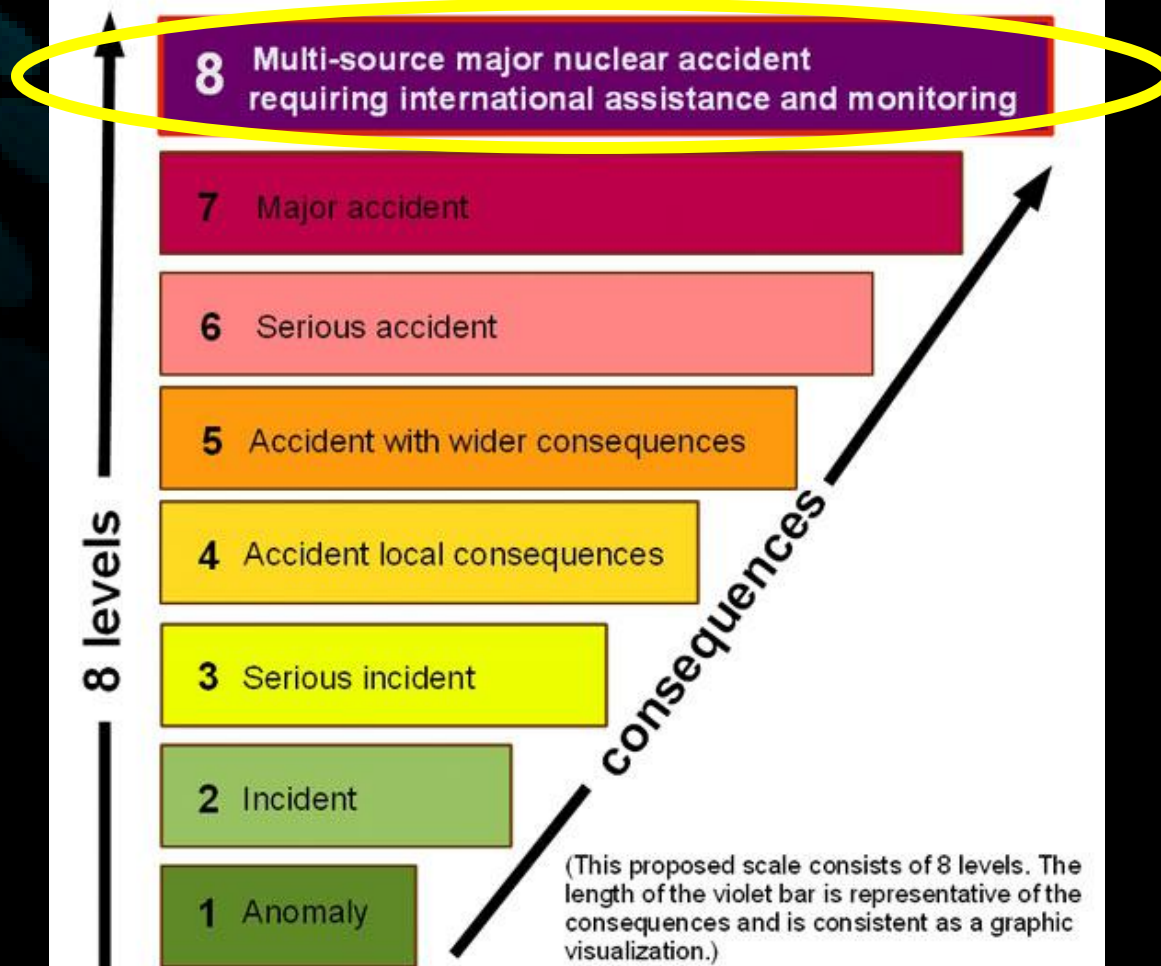
“Only 4 hours after the earthquake occurred **there was actually a hole being burned through, and melted fuel had been actually leaking through to the outside of the container.** And now we know this information, that this was happening at 7:00 p.m. approximately on that day. But at the time, none of this information was accurately conveyed to me.”

My sound waveform analysis of the reactor #3 explosion supports the prompt criticality theory.

- Arnie Gundersen proposes a “prompt criticality event” theory at unit #3. This is a rapid fissioning event releasing a lot of energy.
- The sound waves indicate a series of three rapidly occurring blasts.
- Two were similar, but the third was very different.
- I propose that a hydrogen explosion at Unit #3 reconfigured the reactor fuel to create the prompt criticality explosion. The third blast is not understood but matches that of the lesser hydrogen explosion profile.

My proposed INTERNATIONAL NUCLEAR EVENT SCALE

This proposed new scale adds a level 8 which more accurately portrays the reality of the accident at Fukushima and the need for international assistance and responses.



FUKUSHIMA

Updates on TMI Alert's security issues

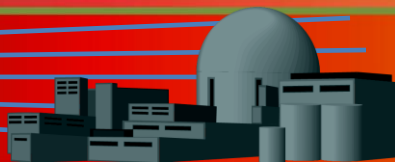


Publicly Available Information

Aerial images now show too much detail.



<http://edition.cnn.com/2009/TECH/06/05/aerial.images.security/#cnnSTCVideo>

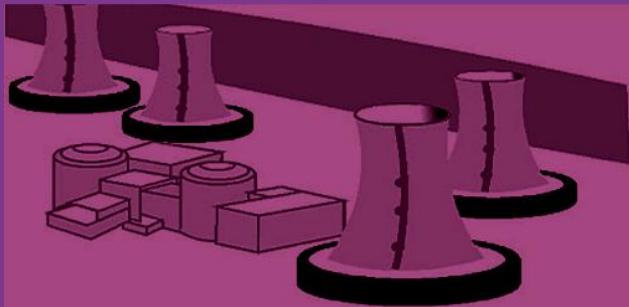


SECURITY

Three Mile Island & four other N-plants

March 2010

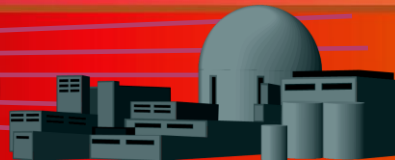
Loyal to his religious belief system



Intelligence is worried that he might have passed insider information onto terrorists.



Sharif Mobley: Arrested in a terrorists sweep of Al Qaeda in Yemen.



INSIDER



Cyber Holes

The cyber threat represents the most
urgent security gap.

- The current state of vulnerabilities has not been assessed in actual testing or probing of nuclear plants.
- There is a lag time to create and implement defenses.

Cyber Space

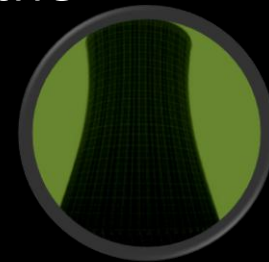
Greatest security **challenge** is the cyber arena:

- never-ending technical challenges
- expenses
- internet, telecommunications networks, computer systems, and embedded processors and controllers in critical industries

Nuclear Plant Easily Hacked

A researcher for IBM 's Internet Security Systems was told it was impossible to hack into a nuclear plant by its owners.

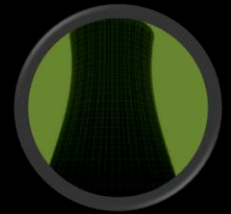
“It turned out to be one of the easiest penetration tests I’d ever done. By the first day, we had penetrated the network. **Within a week, we were controlling a nuclear power plant.**”



America's Hackable Backbone, 2007 ForbesMagazine

http://www.forbes.com/2007/08/22/scada-hackers-infrastructure-tech-security-cx_ag_0822hack.html

Cyber Space



Three new cyber requirements I suggested in 2011 that the NRC has yet to act upon.

Situation Awareness: Order each nuclear reactor licensee to report any cyber trouble(s) within 15 minutes of its discovery.

Passwords: Order all nuclear reactor licensees to change all original default access passwords tied to any component.

Passwords: Order all nuclear reactor licensees to take specific, preventative password control actions as soon as an employee learns of his or her pending dismissal, and immediately upon the dismissal of that employee.

Nuclear plants are not ready for a 9/11 style attack.

NBC News - August 2013



Video

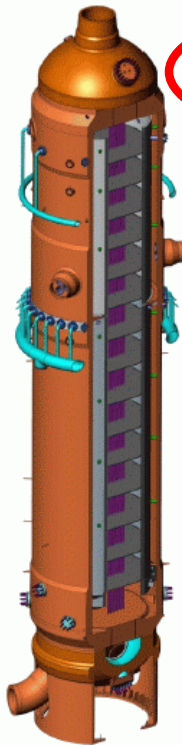
<http://www.youtube.com/watch?v=v6WGjXRImTw>

Update on TMI Safety



TMI's new steam generators have significant design changes

EOTSG Design Overview



TMI-1 installed AREVA, Enhanced Once Through Steam Generators (EOTSGs) in October 2009

- First Operating Cycle, January 2010 – October 2011
- Second Operating Cycle, November 2011 - Present

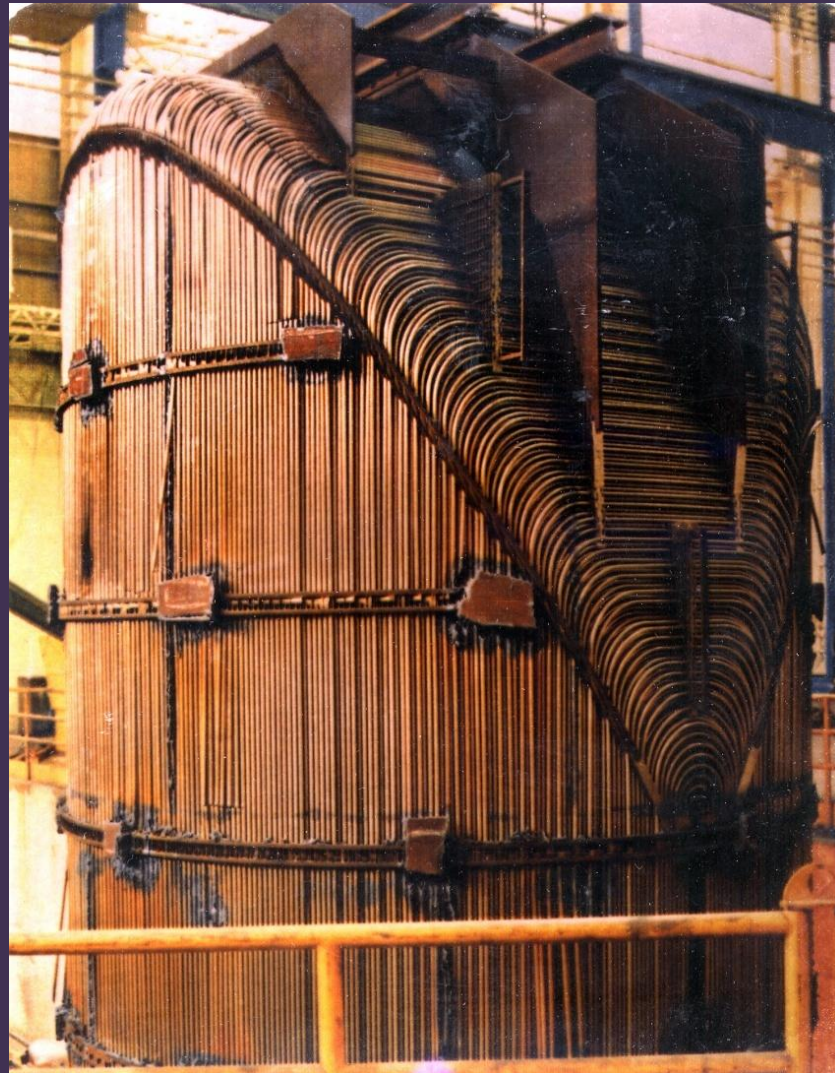
General design features of EOTSGs

- 15,597 tubes per EOTSG
- Full depth hydraulic expansions in tubesheets
- 15 stainless steel tube support plates (TSP)
 - Trefoil broached holes, 1.18" thick
 - Numbered 01S (bottom) – 15S (top)
 - 15S TSP has 1470 drill holes in peripheral tubes
 - Spacing between TSPs varies
 - Aspirating ports are in 10th span
- Nominal gap between tubes is 0.25"

First ISI performed in October 2011

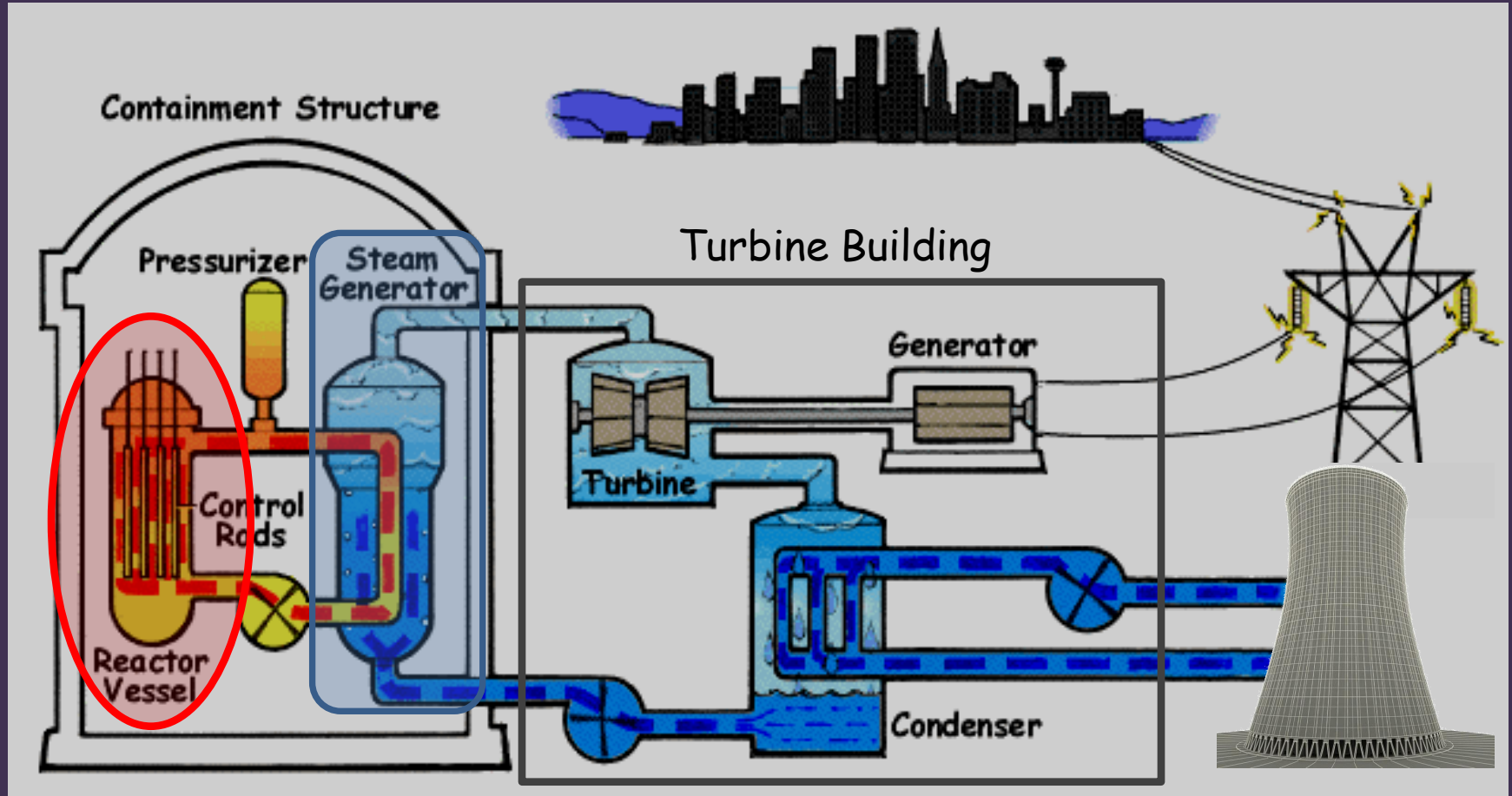
- 24-month fuel cycles
- 1.72 effective full power years (EFPY) on EOTSGs
- Maintained hot conditions throughout operating cycle

Steam Generator Tubes



15,597 tubes per steam generator

Steam generators are the primary method to remove heat from the reactor.



Fuel melts when there is insufficient heat removal from reactor.

THE PROBLEM

The Steam Generator tubes are bowing.

- The tubes bowed sufficiently far enough under normal temperatures to cause some tubes to vibrate against each other and cause premature wear of the tube walls.
- Some tubes vibrated against metal plates and caused similar wear.
- Under higher temperatures, as in a transient or accident conditions, the tubes might bow even further, and more tubes could experience the vibrations problem to the point of rupture failures.
- A meltdown and radiological release could result.

TMI might shutdown.

- TMI is among five U.S. reactors on the "most exposed" list by Morningstar Inc., a global independent investment research firm.
- Exelon, owner of TMI, is now considering closing some of its 17 nuclear reactors located in Illinois, Pennsylvania and New Jersey.

NRC Caught Rigging the New Accident Study!

State-of-the-Art Reactor Consequence Analyses

- SOARCA is a probabilistic risk study similar to the Rasmussen Report - *“area the size of Pennsylvania.”*
- It’s purpose was to analyze the health consequences of a severe accident.
- It’s covert purpose was to be able to testify to Congress that there is enough time to evacuate people during an accident so that no one is harmed.

It's All About the Evacuations!

New NRC study says there will be time to evacuate.

2012

Nuclear accidents pose little risk to health, NRC says

Published February 02, 2012 / Reuters



U.S. NUCLEAR REGULATORY COMMISSION

Print

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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.

The article failed to mention the study was for a few select accident scenarios.

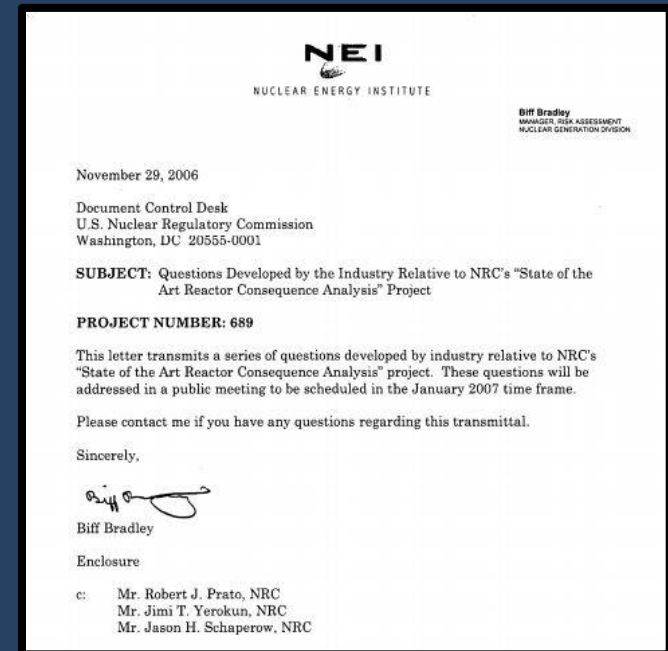
Nuclear Regulatory Commission
State-of-the-Art Reactor Consequence Analyses
(SOARCA)

NEI letter to NRC cherry-picking SOARCA 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



The severity of the TMI accident
get's watered down over time.



OUT OF CONTROL

EXAMINING THE FIRST 10 MINUTES OF THE TMI ACCIDENT

By Scott D. Portzline
2014

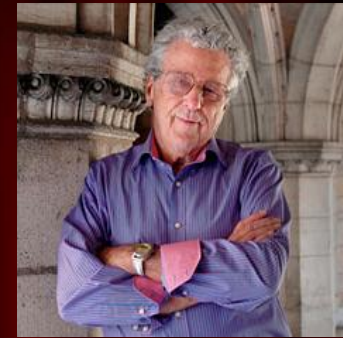
TMI Alert



Book calls TMI a “normal accident in a complex system”



Normal Accidents: Living with High-Risk Technologies

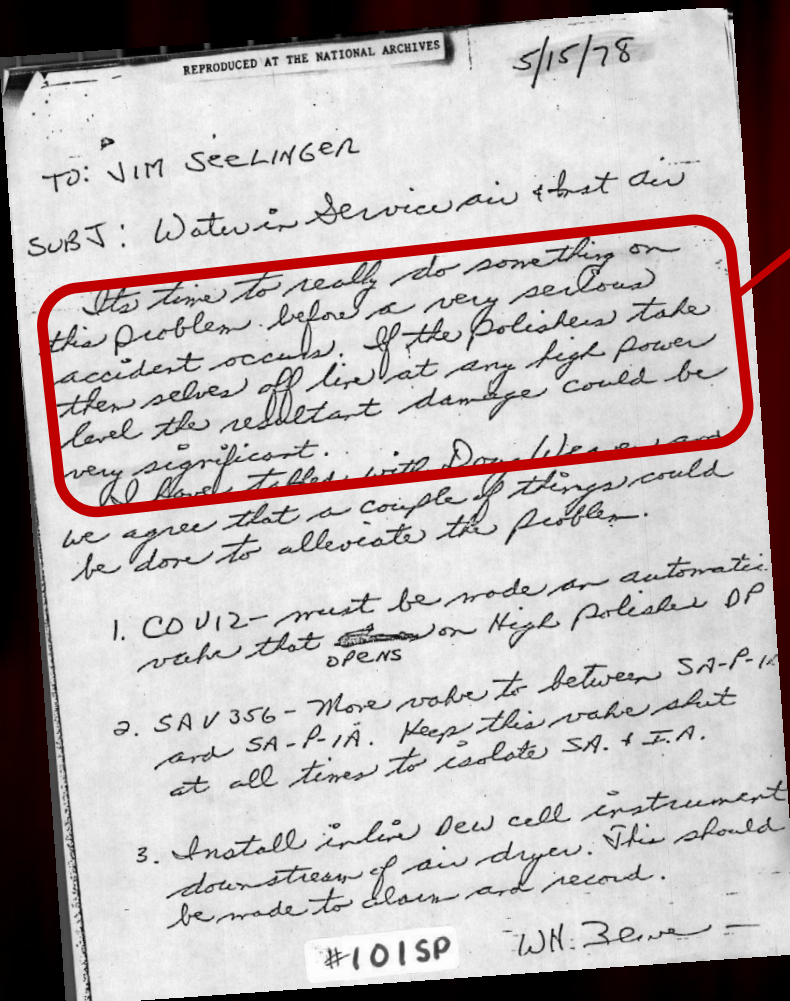


Charles B. Perrow
professor of sociology at Yale

The event was an example of a normal accident in a complex system because it was "unexpected, incomprehensible, uncontrollable and unavoidable."

WRONG

TMI Reactor Operator Foresaw Accident Trigger

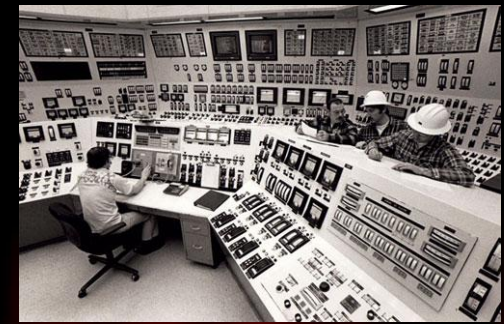


Its time to really do something on this problem before a very serious accident occurs. If the polishers take themselves offline at any high power level, the resultant damage could be very significant.

William Zewe

Memo 10 months prior to the TMI core melt.

TMI Shift Supervisor memo: Severe Alarm System Problems



“The alarm system in the control room is so poorly designed that it contributes little in analysis of a causality. Perhaps we can discuss this sometime, preferably before the system, as it is, causes severe problems.”



Edward Frederick
Senior Reactor Operator

Memo 11 months prior to the TMI core melt.

Chain of Failures

“...about 20 factors contributed to the damaging results at Three Mile Island.”

“If any one of these factors had been different there would have been no core damage and no release of radioactivity.”

Electric Power Research Institute
Includes National Labs and Babcock Wilcox NSAC

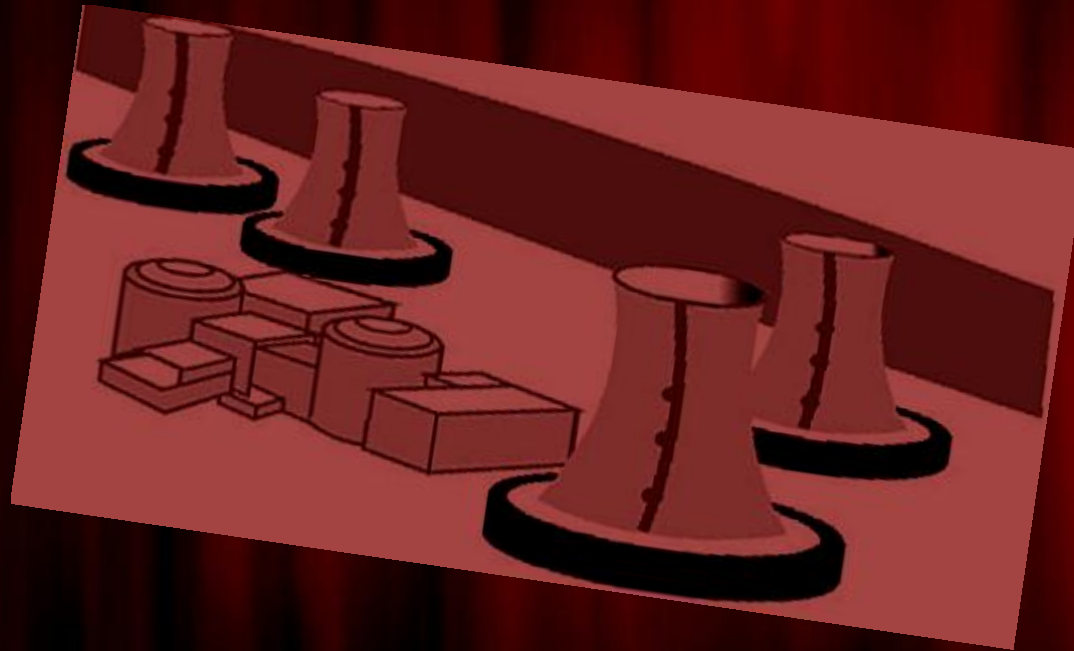
Longer than a Long-shot

In other words, all 20 factors came up against all odds.



Vegas would never let that happen.

3 outrageous facts about TMI's company policy



Seriously Understaffed

“TMI’s maintenance staff was about half of what it should have been. As a result there were about 800 to 1,000 maintenance items that had not been worked on at the time of the core melt.”

NUREG-1020



The Don't Fix It Policy

“We all knew what [the rules] were. If it wasn't safety-required, or didn't degrade the ability of the plant to run at 100% power, it wasn't a necessary change.

That's what I was told. And if anybody in GPU says otherwise, they're kidding themselves. Those were the ground rules.”

Deposition of Gary Miller - TMI Station Manager

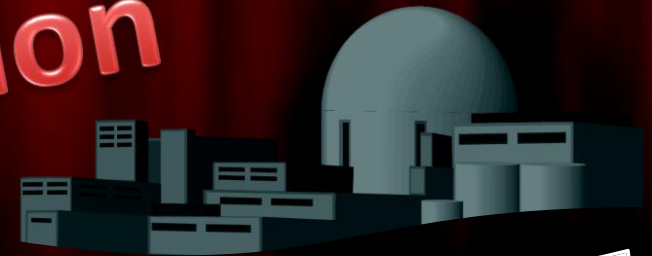


Criminal Falsification

TMI falsified reactor leak rates to avoid the financial losses of shutting down for repairs.

**GPU pleads guilty to
felony falsification**

February 1984



General Public Utilities



Criminal Falsification

TMI falsified reactor leak rates to avoid the financial losses of shutting down for repairs.

The NRC was aware of the leak rate falsifications practice at TMI.

United States Court of Appeals,
Third Circuit



5 troubling facts about operator errors

1

The Head of TMI's Training Department did not have a reactor operator's license.



5 troubling facts about operator errors

2

After his appointment he spent half of his time, and later all of his time, studying for his license.



In November 1978, he took the examination and failed.

5 troubling facts about operator errors



**The Head of Operations
at TMI-2 did not go to training
classes.**



5 troubling facts about operator errors

4

He had someone else take half
of the requalification examination
for his license renewal.

FALSIFICATION
FALSIFICATION

5 troubling facts about operator errors

5

TMI employee attendance for training classes had declined to 30%.



The Blame Game



Three Mile Island accident lawsuit

By JAMES H. RUBIN
Associated Press

WASHINGTON — The Supreme Court today refused to force the government to pay \$4-billion to the company that owns the closed-down Three Mile Island nuclear power plant in Pennsylvania.

The court, without comment, killed a lawsuit aimed at pinning the blame for a 1979 accident at the plant on federal regulatory laziness. The justices let stand a ruling that the Nuclear Regulatory Commission is immune from such a suit.

General Public Utilities Corp., owner of the Three Mile Island facility, sought \$4-billion in property damage, clean-up costs and other losses.

The reactor near Harrisburg, Pa., overheated on March 28, 1979, when a valve failed to close properly. Instruments failed to show that the valve was open. The accident caused major

damage to the reactor's core and

General Public Utilities said the Nuclear Regulatory Commission is at fault because it failed to warn the company that its equipment might be defective.

ment should have been on alert because of a similar accident in the Davis-Besse nuclear plant in Ohio 18 months before the Three

The company also said that federal regulators were too easy on the Pennsylvania plant when issuing its operating license in 1978. The commission should

inspection, the company said.

In February 1984, the 3rd U.S. Circuit Court of Appeals threw out the suit. It said the commission's alleged failure to warn about the incident at the Ohio plant was a matter of the agency's discretion — and such decisions are exempt from challenge in private lawsuits.

GPU said the NRC is at fault because it failed to warn the company that its equipment might be defective.

GPU also said that federal regulators were too easy on the plant when issuing its operating license in 1978.

In Feb. 1984, the 3rd Circuit US Court of Appeals threw out the suit.... It said the Commission's alleged failure to warn about [a similar defect and incident at the Davis Besse] plant was a "matter of the agency's discretion."

Associated
Press
2/19/1985

Believe it or Not

TMI

Transcripts show that during the height of the emergency, the NRC Commissioners wished they had “a good pipe break” to trigger backup systems and get into a mode that they understood.

The staff discussed starting a fire in a control drive motor so that it would fall off of the reactor head leaving a 6 inch hole.

Believe it or Not



TMI

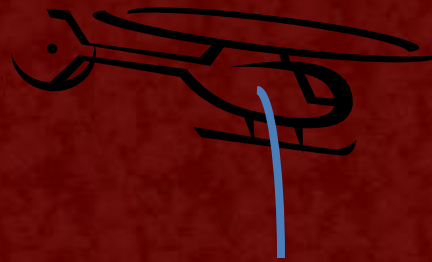
Another idea from Babcock & Wilcox, the designer and manufacturer of the reactor, was to **start up all of the reactor pumps, burn them out and blow the seals** in hope to cause a loss of coolant accident to depressurize the reactor rapidly.



Believe it or Not

The NRC's lead man in Fukushima had a radical idea on how to vent Unit #2 to avoid a hydrogen explosion.

"I would go to the opposite side of the building [from] where the spent fuel is, and I would take a helicopter, and I would drop something right through the roof, you know, and just cave in the roof."



from NRC transcripts

Believe it or Not

Now that man is head of NRC Region III.



Seven points to set the record straight.

Three Mile Island

1. No one knows exactly how the accident began.
2. Control room operators were making plans to evacuate the control room. They planned to leave behind cameras to record the control panel to see what happens during a meltdown.

Seven points to set the record straight.

Three Mile Island

3. **TMI has not been cleaned up.** The radioactive content of the reactor building immediately after the accident had been estimated at 10 billion curies. The “Clean Up Program” has ended, but there remains lethal amounts of radioactivity inside Unit #2. The basement levels are still very, very high.
4. **TMI did not end new orders for nuclear plants.** In actuality, new orders stopped the year before TMI.

Seven points to set the record straight.

Three Mile Island

Point **4**
continued

The cause: A lawsuit was filed by State Attorneys General against General Electric (GE) for knowingly hiding safety defects. Utilities were reluctant to order new plants until the lawsuit was settled. The estimated cost to correct the defects was billions of dollars.



Seven points to set the record straight.

Three Mile Island

Point **4**
continued

What was one of the safety defects hidden by GE?

The Mark 1 containment building had a 90% chance of failing during accident conditions.



a 100%
failure rate

It happened 3 times at Fukushima.

Seven points to set the record straight.

Three Mile Island

5. No one knows how much radiation was released. All published amounts are only estimates.

- The health studies used estimates of 13 million curies – mostly noble gases.
- Later reassessments estimated releases of 30 million curies.
- No one has accurately accounted for radiation released from the turbine building when the steam generator tube barriers failed.

Seven points to set the record straight.

Three Mile Island

6. Radioactive noble gases are hazardous.

Published accounts state that the vast majority of radiation released from TMI (13 million curies) was in the form of noble gases (inert) and therefore pose little threat to health.

However, Radon, a noble gas, is responsible for 9% of fatal lung cancers in the US.



a hazardous noble gas

Seven points to set the record straight.

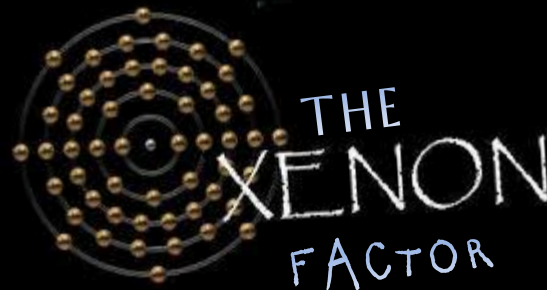
Three Mile Island

Point **6**
continued

Since it was assumed that noble gases are not absorbed by the body unless inhaled, only a miniscule amount of the 13 million curies was calculated into the population dose (uptake).

But like radon, the radioactive gases from TMI's took its toll on some people, causing cellular damage in the lungs, and then the bloodstream.

This is just one example of many miscalculations on the health effects from TMI.



Seven points to set the record straight.

Three Mile Island

Point **6**
continued

A reassessment of the noble gas uptake in 1990 stated,

“Our estimates are consistent with the conclusion which was reached by government reports regarding the accident, there would be **no observable health effects** in the general population around TMI.

However higher rates of lung cancers and leukemia were observed in clusters as reported in that same 1990 reassessment.



Seven points to set the record straight.

Three Mile Island

Point **6**
continued

The assessment continued:

“Epidemiology does not have an adequate model to verify the effects came from TMI gases as stated by the assessment.”

Correct!
Dose assessments for specific individuals do lack accuracy.

Seven points to set the record straight.

Three Mile Island

Point **6**
continued

The observations of lung cancer clusters **are also consistent** with the inhalation of radioactive gases.

The observations of leukemia (blood cancer) clusters **are also consistent** with the inhalation of radioactive gases being absorbed by the bloodstream.

This data matches the findings of Dr. Steven Wing.

Seven points to set the record straight.

Three Mile Island

Point **6**
continued

In Fact !

The conclusions of the other health studies are inconsistent with the observable health effects.

The old model is incorrect.

Seven points to set the record straight.

Three Mile Island

History will prove that to be the case.

Because we were the human
dosimeters with observable
health effects.

Seven points to set the record straight.

Three Mile Island

7. All of the original health studies found increased cancers.

However, the studies did not scientifically link those cancers to TMI because of the accepted belief that not enough radiation had been released to cause any health effects.

100%
found increased
cancers

Seven points to set the record straight.

Three Mile Island

Point **7**
continued

**100% found
increased cancers**

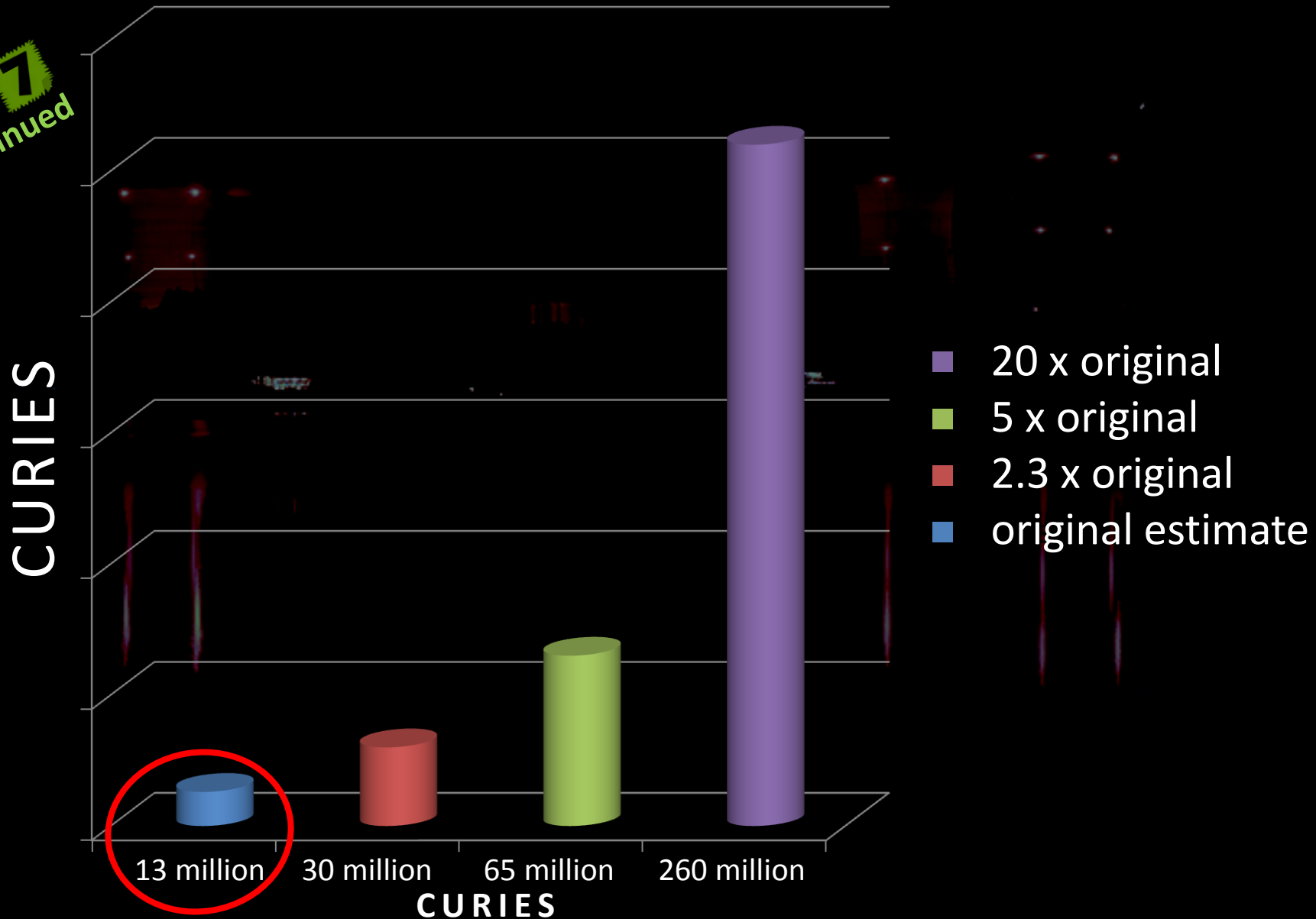
In effect, there was no need to do any epidemiology studies if the possible conclusions were already limited to one choice of outcomes – “no one was harmed.”

The fact is, no one knows how much radiation was released. There are scientists who **calculate** 5 to 20 times the amount released as previously estimated. Some **estimate** 100 times greater release amounts than previously estimated.

Seven points to set the record straight.

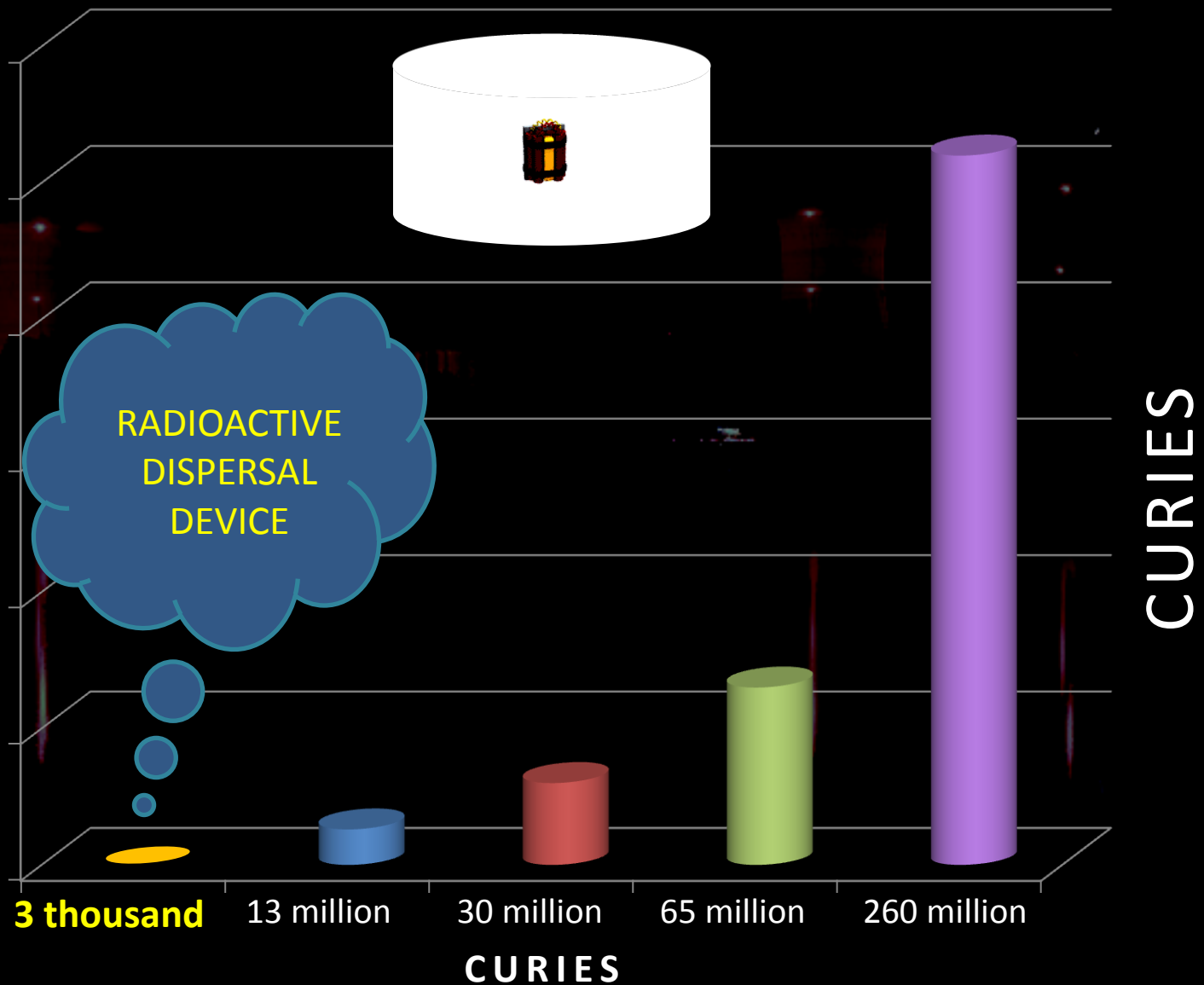
Three Mile Island radioactive release estimates

Point 7
continued



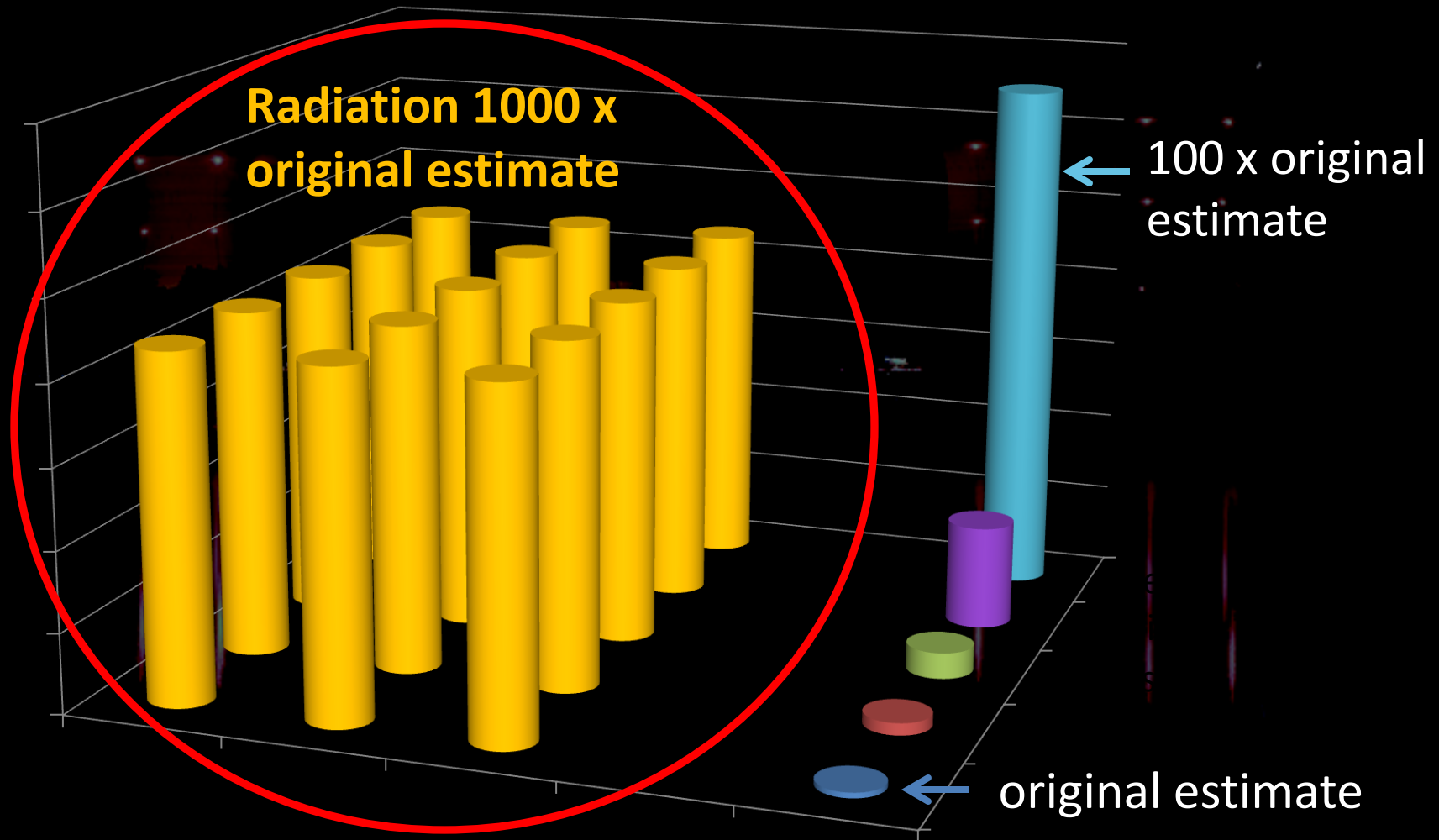
How many curies does it take to be charged with radioactive terrorism?

The stolen
Cobalt-60
event in Mexico
last year was
approximately
3000 Curies.



Seven points to set the record straight.

Three Mile Island radioactive release estimates





online opportunities for anti-nuclear folks



Nuclear Hotseat

weekly podcasts,
news updates,
entertaining



NIRS.org

webinars,
updates, conferences,
informative website



Nukenet

email group on
nuclear matters

Beyond Nuclear



informative website,
weekly updates

Fairewinds.org



Arnie Gundersen's
weekly podcasts,
Fukushima updates

Union of Concerned Scientists



important safety analysis
and reports

