TMI: A Legacy of Lies

Penn State Harrisburg, PA

March 27, 2019

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Arnie and Maggie Gundersen

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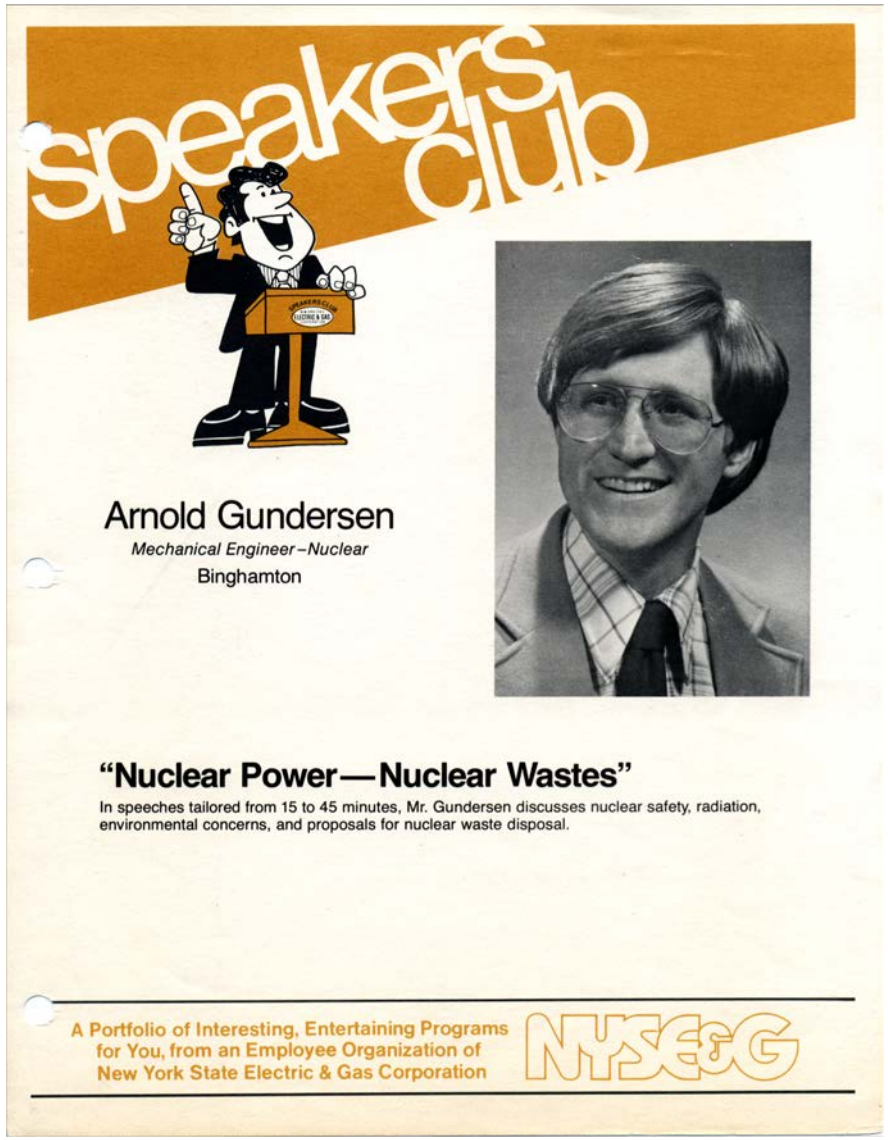
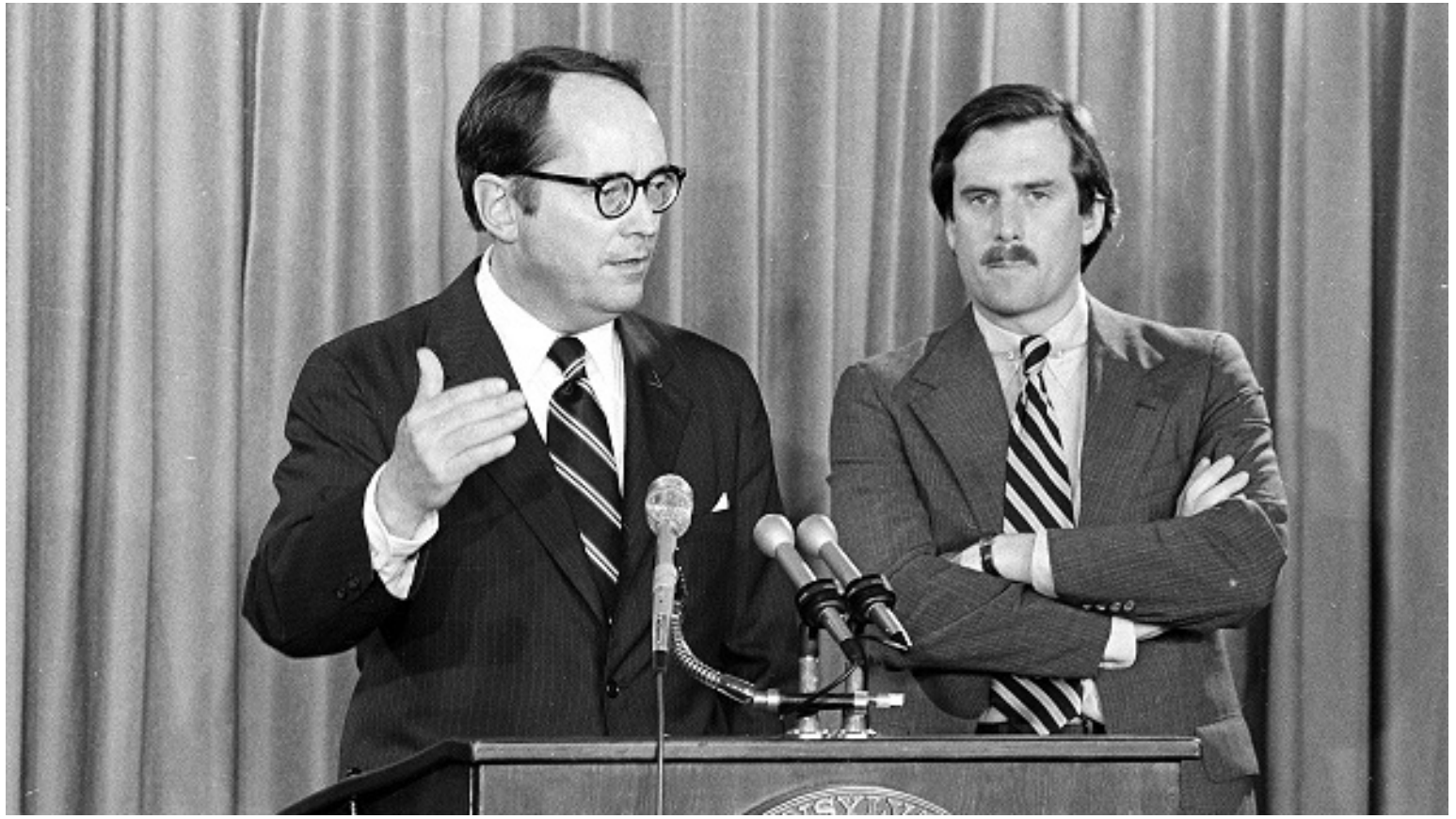
1979: Speaking About Three Mile Island



Three Mile Island Meltdown

Governor Thornburgh



AG: Governor, you were lied to on March 28, 1979
Thornburgh: "Yes, I was lied to."

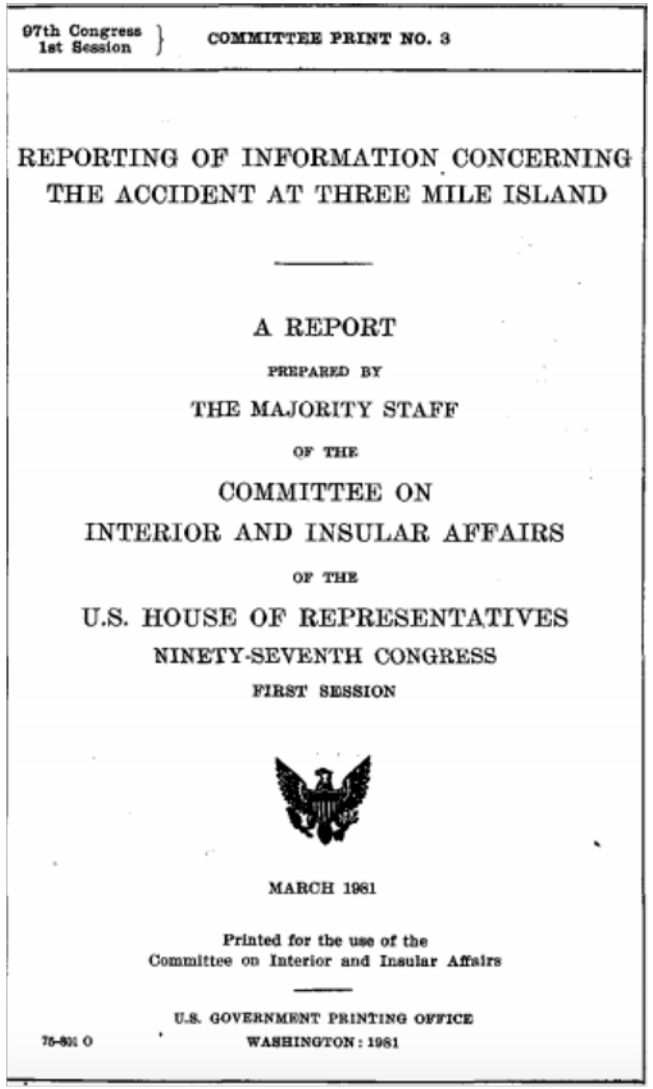
Peter Bradford

Former NRC Commissioner during TMI

“I believe Thornburg would have ordered an evacuation if we had told him to. But we didn’t have accurate information either.”

“I never had the sense that Met Ed had the capability to devise a corporate conspiracy in real time. I'm less certain as to whether individuals deliberately understated at least the uncertainties of the situation, if not the specifics… I remember thinking that Henry (Meyers) made a pretty convincing case as to a couple of individuals…”

Dr. Henry Meyers, Science Advisor to Senator Mo Udall



97th Congress
1st Session

COMMITTEE PRINT NO. 3

REPORTING OF INFORMATION CONCERNING THE ACCIDENT AT THREE MILE ISLAND

A REPORT

PREPARED BY

THE MAJORITY STAFF

OF THE

COMMITTEE ON

INTERIOR AND INSULAR AFFAIRS

OF THE

U.S. HOUSE OF REPRESENTATIVES

NINETY-SEVENTH CONGRESS

FIRST SESSION

MARCH 1981

Printed for the use of the
Committee on Interior and Insular Affairs

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1981

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Gundersen Expert Report on TMI

EXPERT WITNESS REPORT

THREE MILE ISLAND LITIGATION

FOR HEPFORD, SWARTZ, AND MORGAN
— REPRESENTING PLAINTIFFS

Table of Contents

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FINDING 1 — Minimizing Exposure to the Public

Prior to the accident at Three Mile Island (TMI) Nuclear Power Station, the Defendant clearly understood its legal responsibility for operating a safe nuclear power plant and for protecting the health and safety of the general public, in the event of a nuclear accident.

- The Defendant specifically said, "A high degree of protection against the occurrence of postulated accidents... is provided through correct... operation..."[1]
- Additionally, the Defendant acknowledges its responsibility for "Protection of the health and safety of the Public" and to make "... every reasonable effort to minimize exposure... even in emergencies."[2]

FINDING 2 — Providing Information to the State of Pennsylvania

Prior to the accident, the Defendant understood its legal responsibility for prompt and accurate information and notification to limit exposure to the general public. Specifically,

- The Defendant acknowledged it was "... responsible for prompt notification of appropriate Pennsylvania State Authorities if an accident is causing or is threatening to cause significant off-site exposure."[3]
- The Defendant also acknowledged that "... early information [is] needed to decide what action must be taken to limit radiation exposure to the general public in the event of a site or general emergency."[4]

FINDING 3 — Accident Damage Indications

During the first several hours (i.e. by no later than 10 a.m.) following the accident, the Defendant had accurate information from multiple, independent sources which indicated severe core damage, release of lethal concentrations of radioactive material into the containment, and hydrogen generation from a zircromium-water reaction. Specifically:

Should an evacuation have been ordered?

Before 7am

1. Engineer and supervisor using approved emergency procedure calculate exposure in Goldsboro at 10R/hr.

2. By this emergency procedure, an evacuation was required.

3. At 7:30 TMI called the State and told them 10R/hour seemed too conservative.

Should an evacuation have been ordered?

Before 7am

4. TMI did not tell the State that employees already received significant radiation exposure.

5. TMI did not tell the State that almost every radiation monitor was already off scale.

6. The State was informed that a helicopter flew to Goldsboro at 7:30am and found no radiation. In fact, a helicopter never arrived on-site until 8:30am.

Should an evacuation have been ordered?

Before 10am

1. Core thermal couples indicate temperatures in excess of 2100 F.

2. Hot leg thermal couples indicated super heated steam or hot gases in excess of 700 F.

3. Reactor coolant pump amperage indicates steam, not water, being pumped.

4. Neutron detectors outside vessel indicate excess neutrons.

Should an evacuation have been ordered?

Before 10am

5. Reactor building dome radiation monitors indicate lethal radiation..

6. Reactor coolant samples indicate extensive fuel failures (200R/hr).

7. Health Physics informs management to evacuate Auxiliary Building.

Should an evacuation have been ordered?

Before 2pm

1. Based on core temperature, it's clear that Hydrogen is being generated by 10am.

2. 12:20 - NRC asks '*what is core temperature?*'

3. TMI responds '*computer is printing question marks*', '*that means the computer is messed up*'. In fact, the computer was working and the question marks indicated that the temperature had exceeded 700 F.

Should an evacuation have been ordered?

Before 2pm

4. Hydrogen Explosion. TMI informed NRC two days later.

5. Plant manager in control room, when detonation occurred, four operator affidavits confirmed his awareness of the explosion.

6. Control room shook.

Should an evacuation have been ordered?

Quotes from Plant Manager Miller.

referring to in-core temperature.

“They were hot enough that they scared you.”

“Pretty early we were scared... radiation was all over the place. Everything was off scale”.

-in phone call to corporate requesting a General Emergency.

“We don't know where the hell the plant was going”

“We were not, in our minds, convinced the core was totally covered.”

The TMI Class Action Trial

Defendant attorney Chub Wilcox, while deposing me for the TMI trial, asked me, “You mean that in the midst of all this confusion, you expected us to tell the governor?”

I replied and said, “That’s exactly my point, your client was confused and did not convey that to the Governor.”

How much Radiation Escaped?

How Much Radiation Escaped?

Early on in the accident, the NRC estimated that 10,000,000 Curies of radiation were released.

This value for radiation release is still quoted on the NRC's website today

One Curie is 37,000,000,000 (37 Billion) disintegrations per second.

How Much Radiation Escaped?

Because all on-site radiation monitors were off scale, it was impossible to measure the radiation released from TMI.

All analysis of radiation releases are based upon estimates are based upon off-site dose readings to which mathematical corrections were applied.

How Much Radiation Escaped?

Here's what the NRC's John Collins had to say about off-site measuring of dose.

"My problem... the concern I have about aerial monitoring was that for the first three days we were pretty much into a very static air condition. There was very little dispersion. When you were flying your helicopter and taking your aerial measurements, you were actually reading erroneous readings... ***I really doubt some of the measurements that were made****."*

How Much Radiation Escaped?

Here's what the NRC's John Collins had to say about off-site measuring of dose.

"...not only should we have good monitors but also people who understand how to use them. That was a problem here since day one. They get data and nobody sits down and evaluates the data to try and understand what it means."

"Going out in an automobile and chasing a plume with a meter is a very difficult job. You never know the width of the plume, you never know whether you are in the center or on the edge of it. At best, it gives you a rough idea."

How Much Radiation Escaped?

The NRC estimate is based on a report by NRC manager, Mr. Lake Barrett. NUREG-0637, Appendix C.

Barrett uses time averaged plume dispersion (Chi/Q).

Barrett assumes the center (highest concentration) of the plume hits the detector.

Barrett then averages many days of releases.

How Much Radiation Escaped?

Barrett	Table #	Dates	Maximum Curies
	2	3/28 – 3/29	14,000,000
	3	3/29 – 3/31	5,600,000
	4	3/31 – 4/1	9,800,000
	5	4/1 – 4/2	1,100,000
	6	4/2 – 4/3	4,300,000
	7	4/3 – 4/4	162,000
	8	4/4 – 4/5	1,100,000
TOTAL			**36,062,000**

How Much Radiation Escaped?

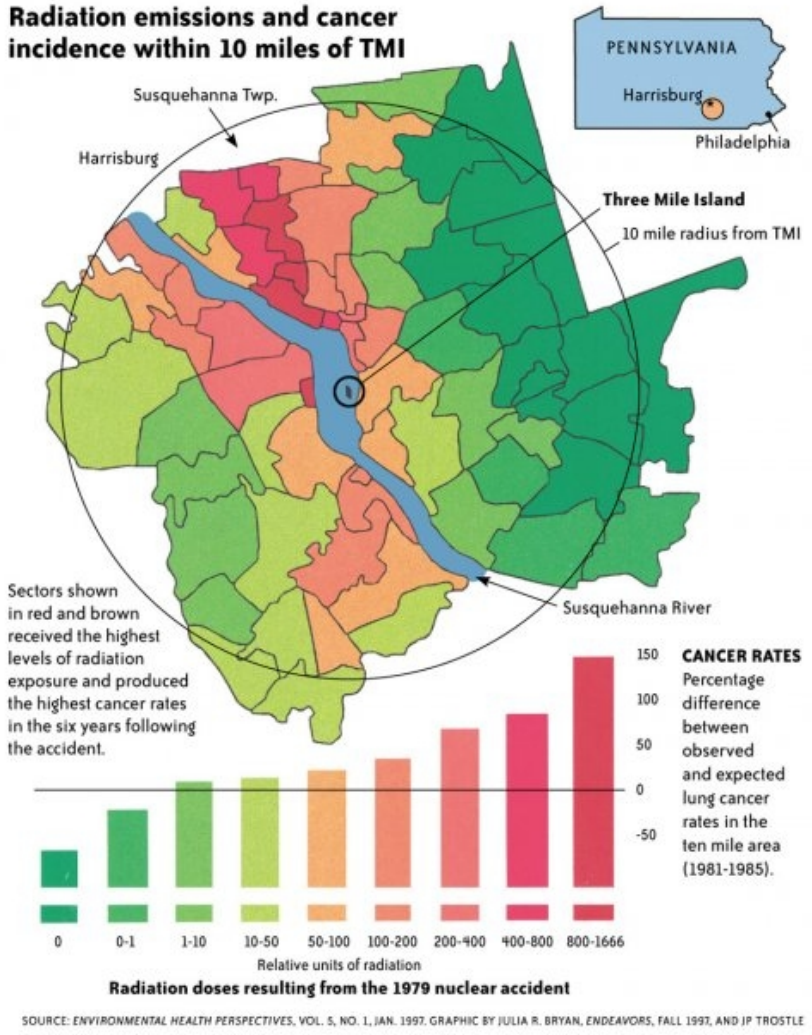
During the TMI class action trial, nuclear industry witness John Daniel tried to prove that 10,000,000 Curies were released. He attempted to calculate this release differently than the NRC by estimating what radiation was in the core and in the containment.

Gundersen analyzed Daniel's report and showed that using Daniel's assumptions, the actual release was at least 150,000,000 Curies.

Daniel then refuted his initial report and changed his assumptions to show that 17,000,000 Curies were released.

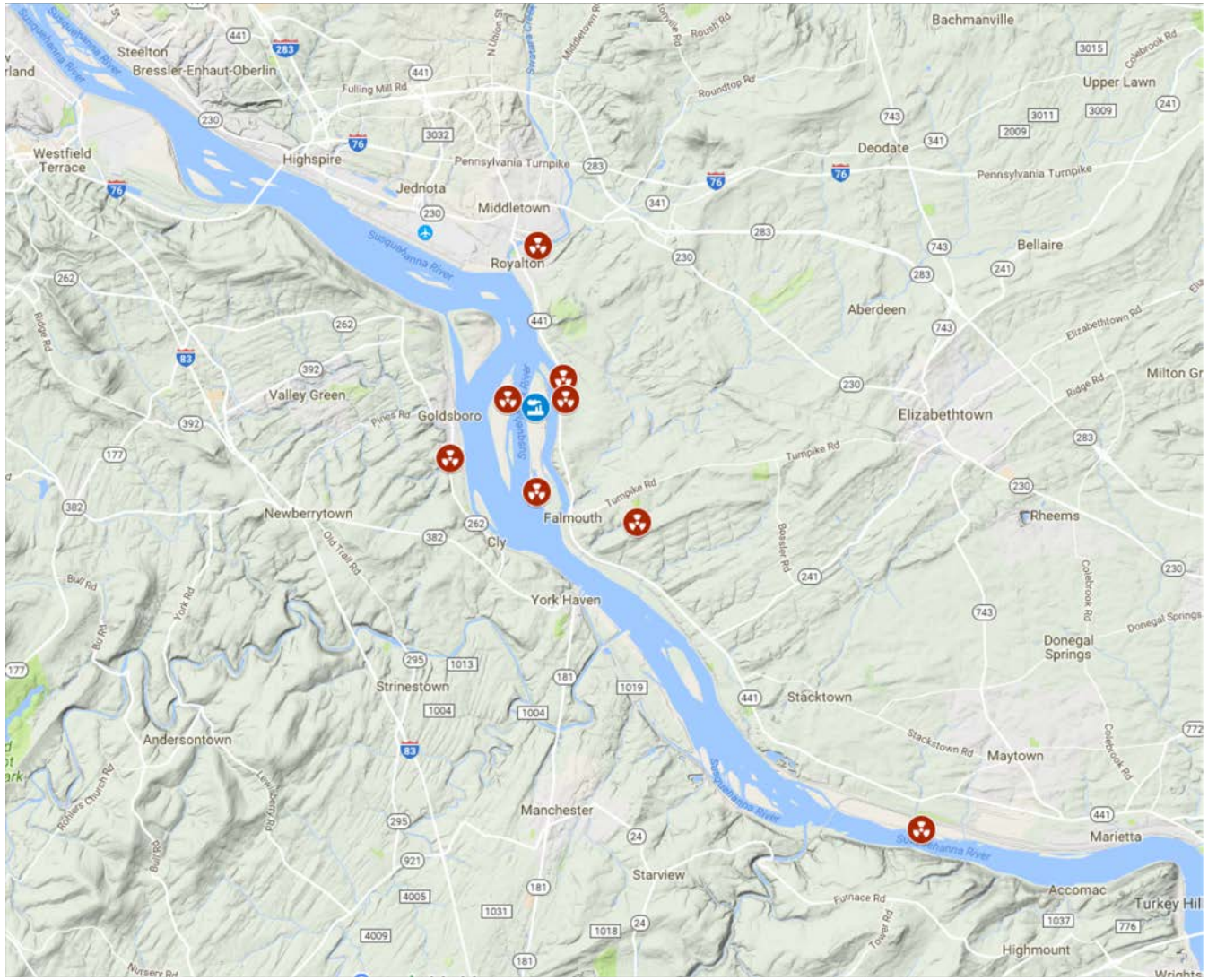
The nuclear industry's own witness estimated more radiation was released at TMI than the NRC estimated.

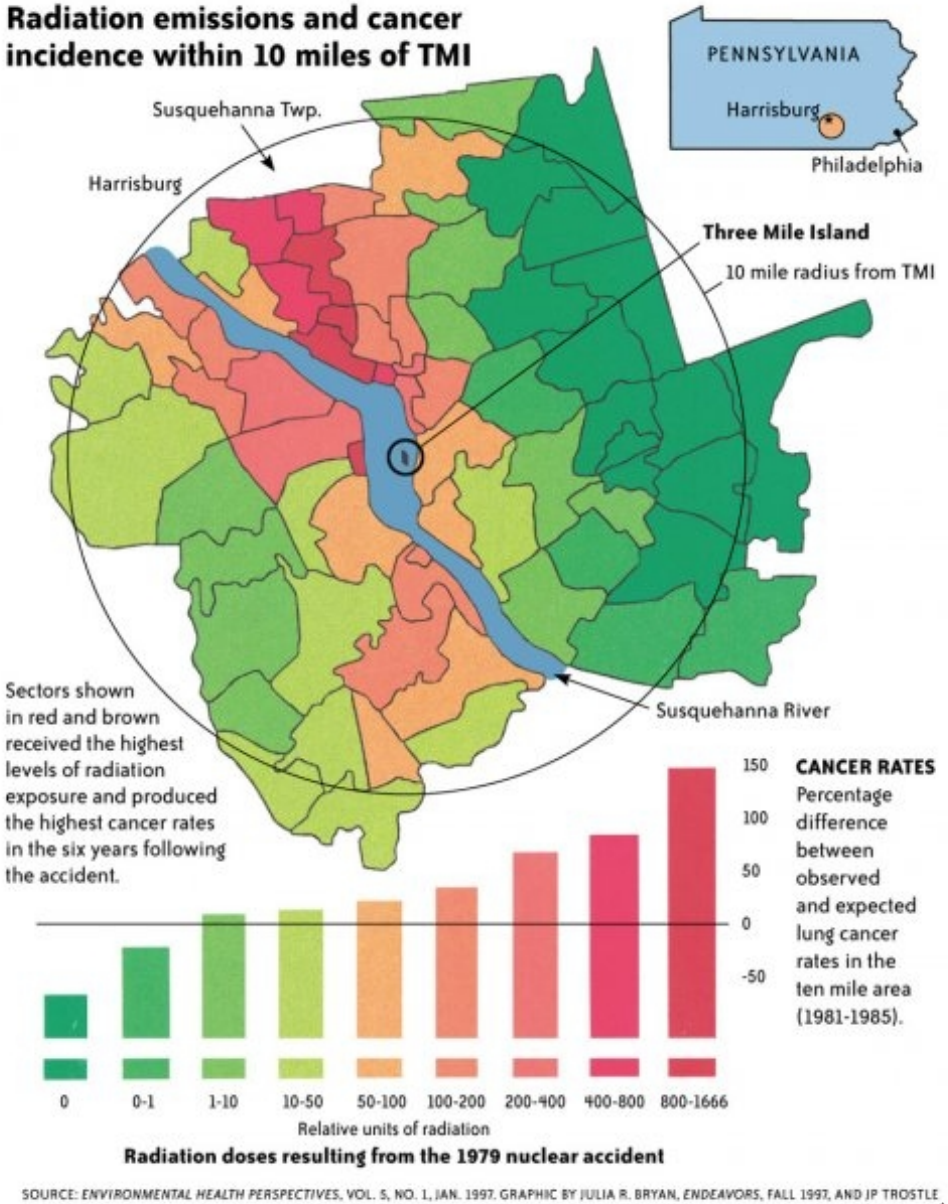
Three Mile Island: Dr. Steve Wing



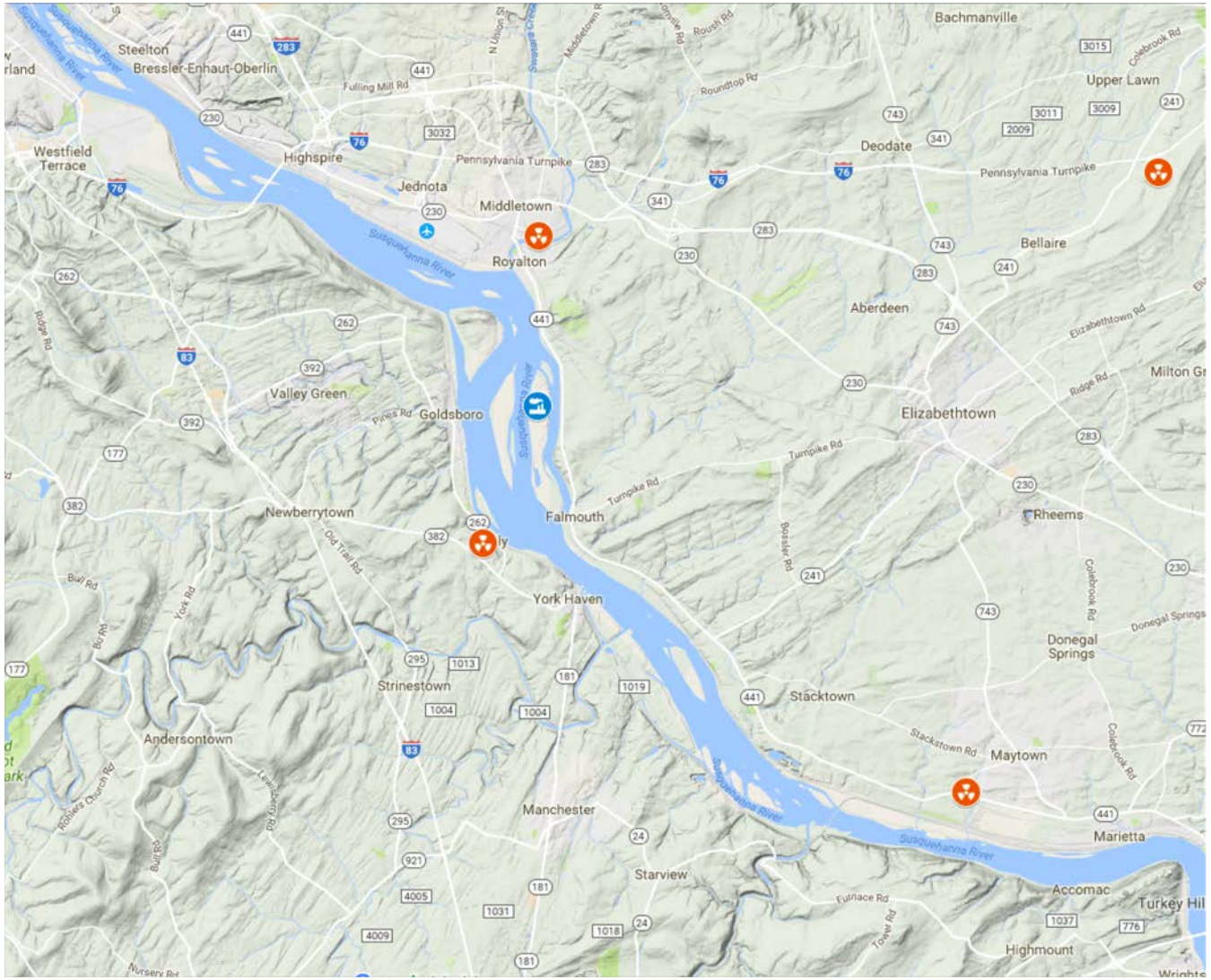
New York Academy of Medicine – March 2013

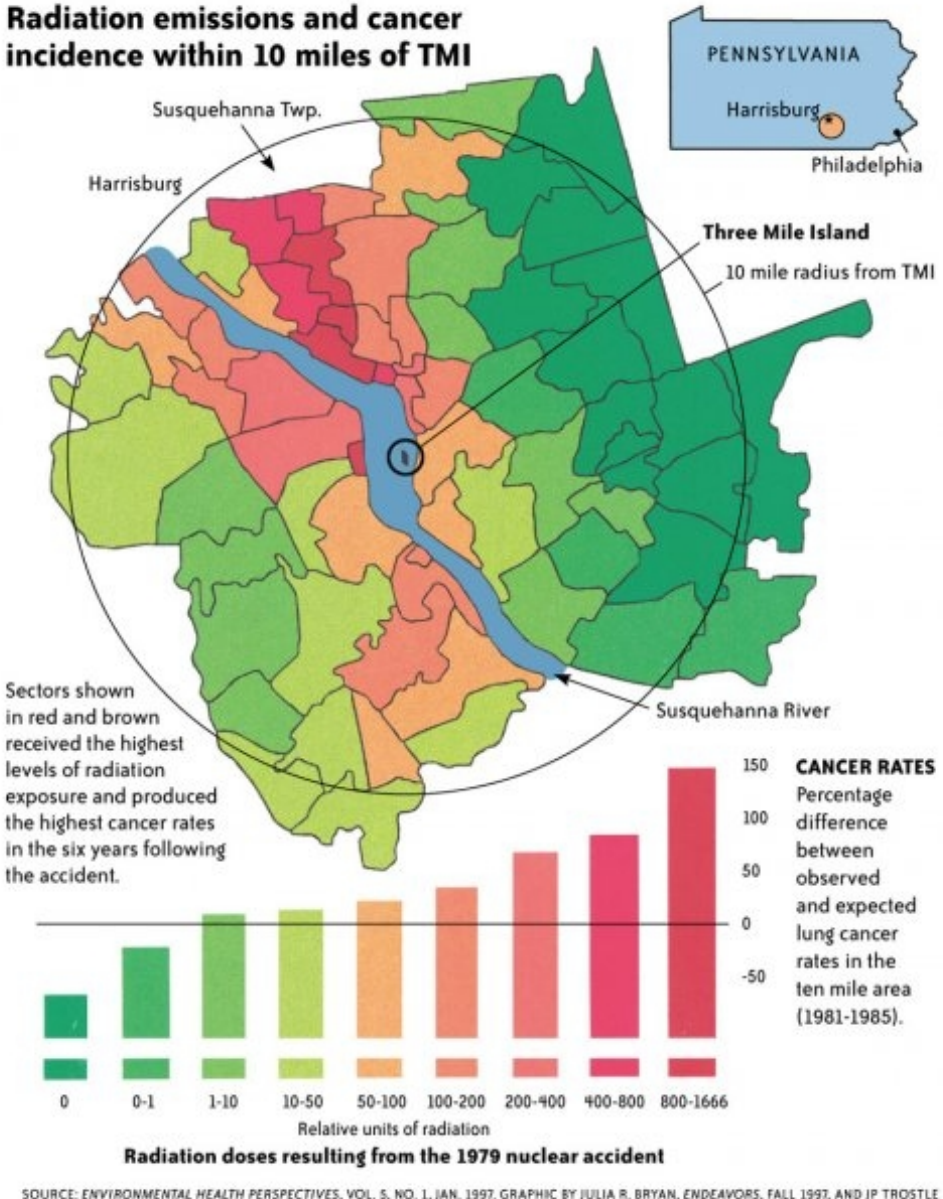
NRC Radiation Detectors: Day 1



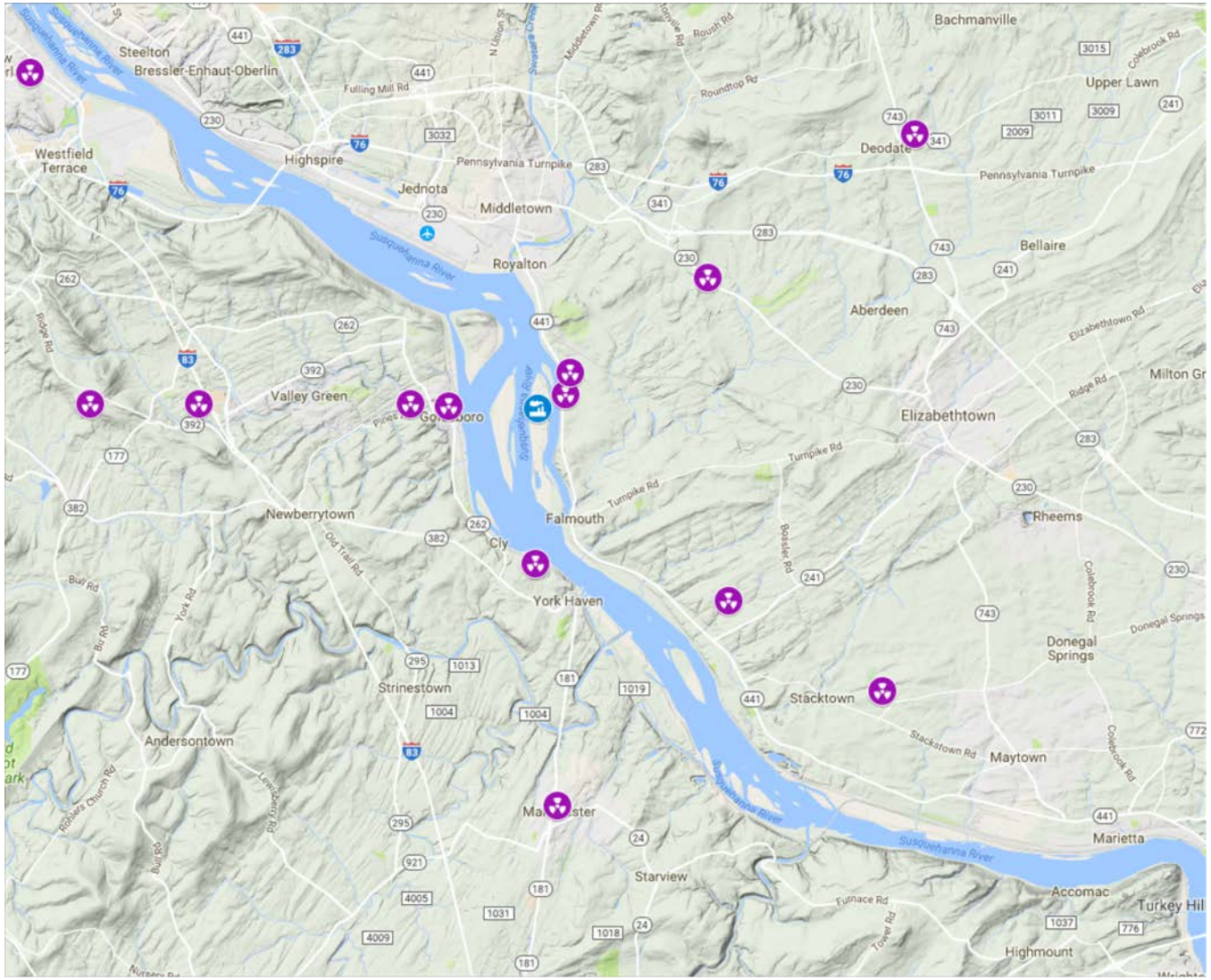


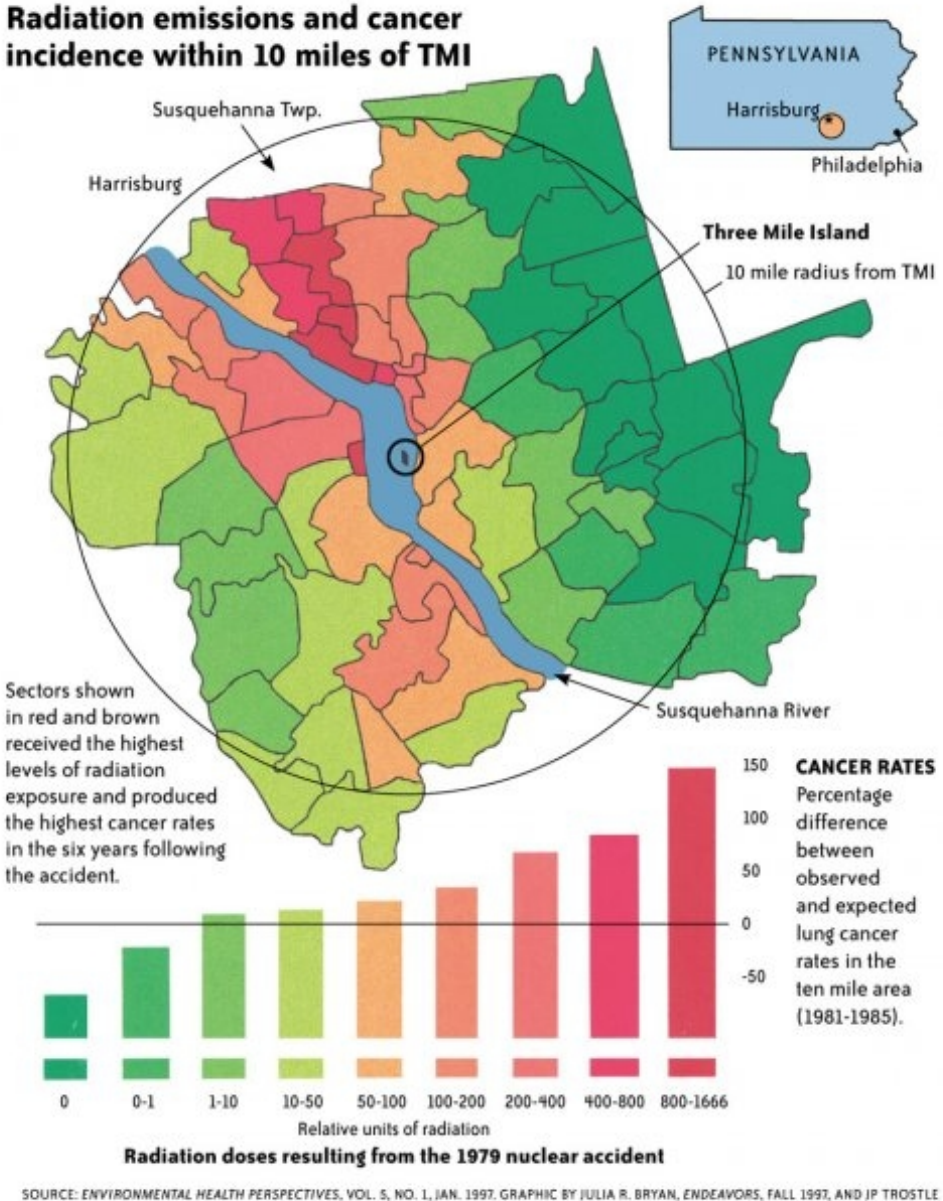
NRC Radiation Detectors: Day 2



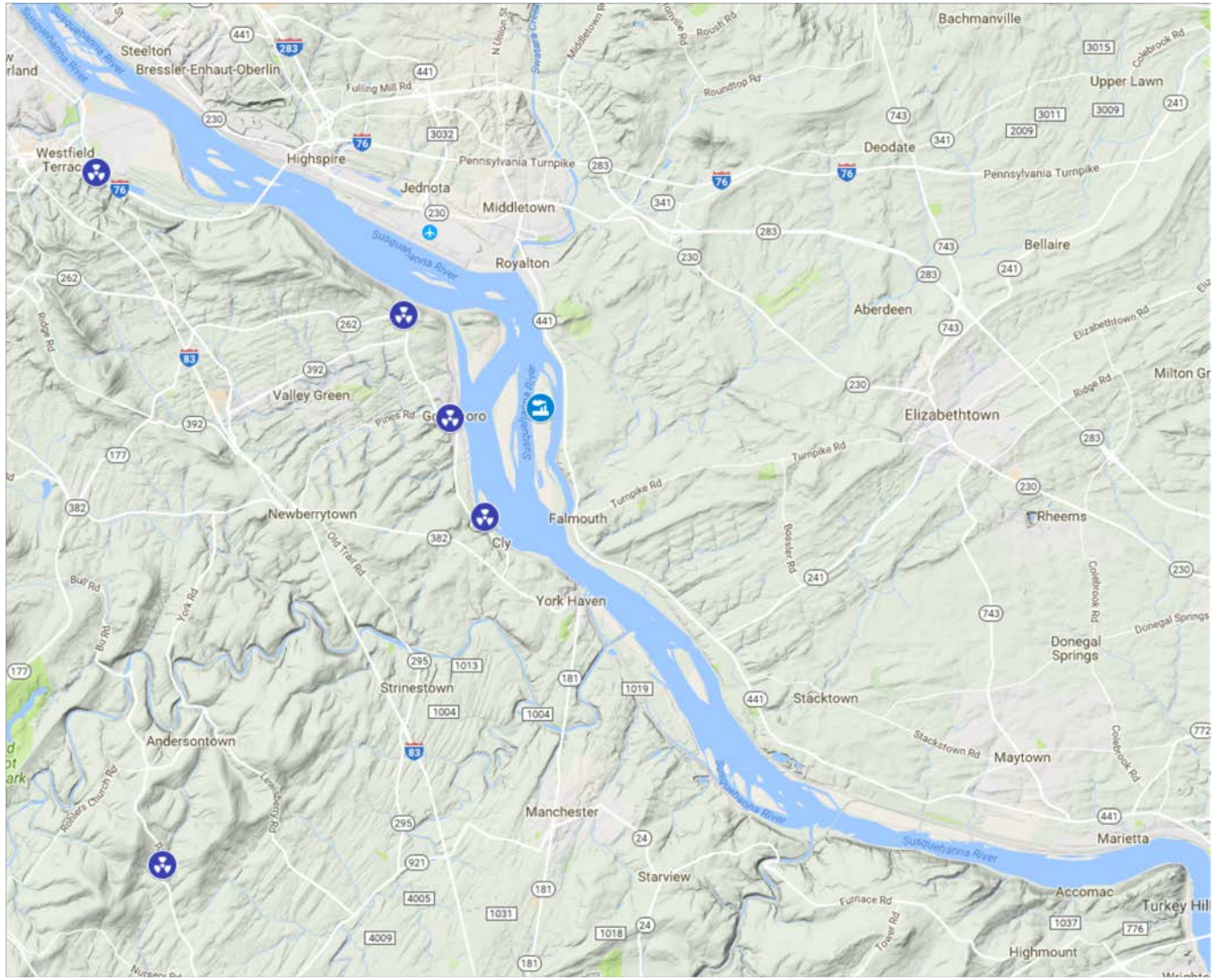


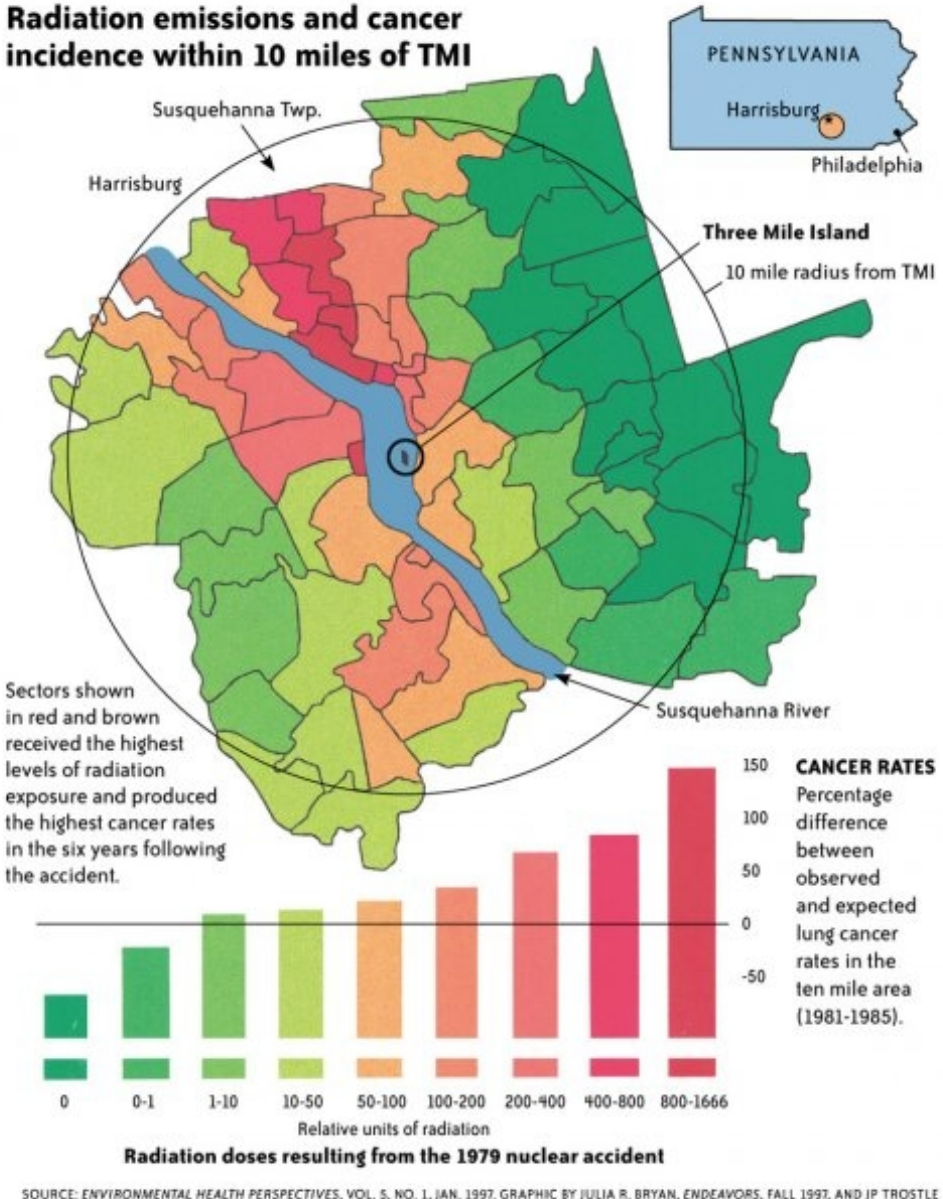
NRC Radiation Detectors: Day 3





NRC Radiation Detectors: Day 4





How Much Radiation Escaped?

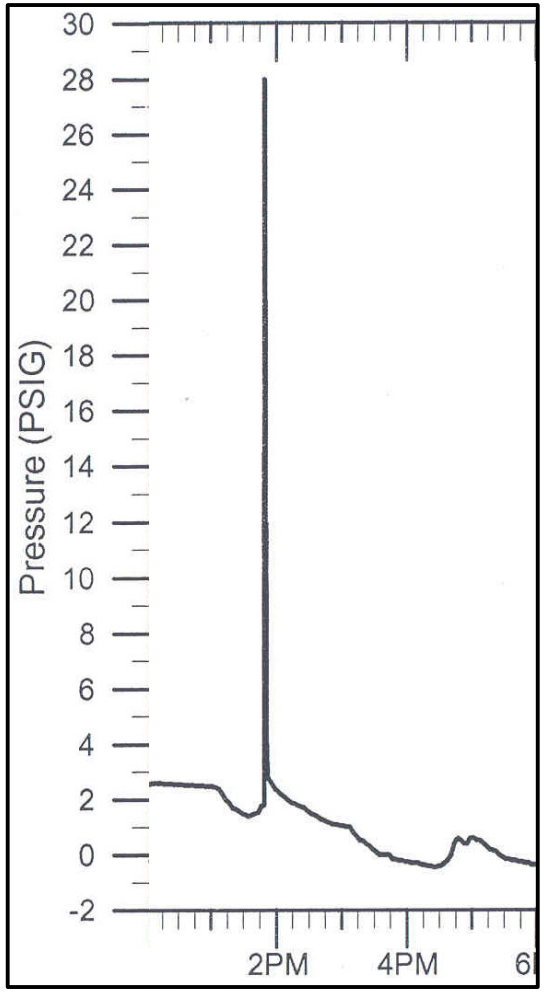
Recently released records from Hershey Chocolate, as quoted by Dr. Hellen Caldicott, in her book, “Nuclear Power is Not the Answer”, shows that Iodine-131 was measured in milk as far as 150 miles away from TMI in the several days immediately after the disaster. This proves that the NRC’s assumed radiation releases are wrong.

Did the Containment Leak?

The pressure spike is for the whole containment; sub-compartments are higher.

Before detonation, pressure is 3 pounds higher then outside air pressure.

After detonation, pressure remains at or near outside air pressure, which means the last remaining barrier containing the radiation was breached.



Did the Containment Leak?

Expert report of Dr. Sinovy V. Reytblatt at TMI Class Action Trial *(12/17/2005)*, p19

"A plausible release of up to 8 to 10% of the volatiles may have occurred due to the unavailability of the containment system at the time of the accident."

Did the Containment Leak?

Industry witness John Daniel reported that immediately after the detonation:

Radiation monitor HP-R-234 recorded a five-fold increase in radiation.

Radiation monitor HP-R-3240 recorded a ten-fold increase, and then went off scale.

Radiation monitor MU-R-720H doubled in detected radiation. This monitor was protected by 4 inches of lead, meaning that it only measured powerful gamma rays and not any beta or alpha isotopes.

Did the Containment Leak?

Time averaged plume dispersion can be wrong on the low side by a factor of 10.

Center line Chi/Q can be wrong on the low side by a factor of a 1000.

Averaging the data is wrong on the low side by a factor of 3.4.

THE NET EFFECT IS THAT THE NRC'S 10,000,000 CURIES IS DEFINATELY LOW. THE ACTUAL RELEASES COULD BE 10 TIMES HIGHER THAN THE NRC'S ESTIMATE.

How much Radiation Was Released?

Organization	Release (Curies)
Industry Witness John Daniel	150 Million Initial
NRC Lake Barret	34 Million
Industry Witness John Daniel	17 Million Revised
NRC Website	10 Million

In an Email to Fairewinds, a Former High School Student at Middletown HS Shared Her Account of the Morning of the Accident

“Our chemistry teacher had taught the whole semester on nuclear power and waste storage, and so he had run a Geiger counter out side the window for the entire semester. The morning of the accident, my chem class started at around 10am. As we entered the classroom the Geiger counter went haywire from the normal clicking to a solid buzz sound. He immediately picked up the phone and called Governor Thornburg's office and reported the readings. The response was "We know, and don't do anything." By 11 am, parents were coming to the school and pulling out their children. Of course, many people in town worked at the plant or had relatives who did, and they did not wait for a formal evacuation call.”

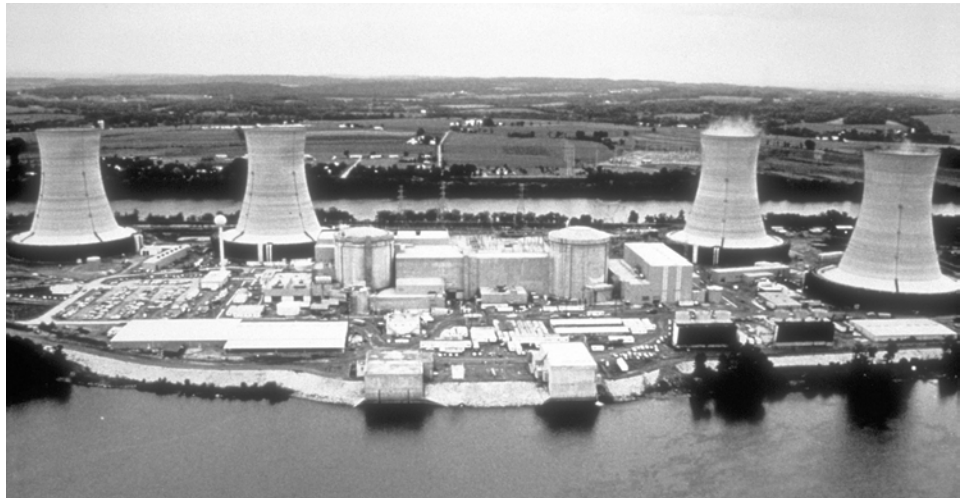
Conclusions

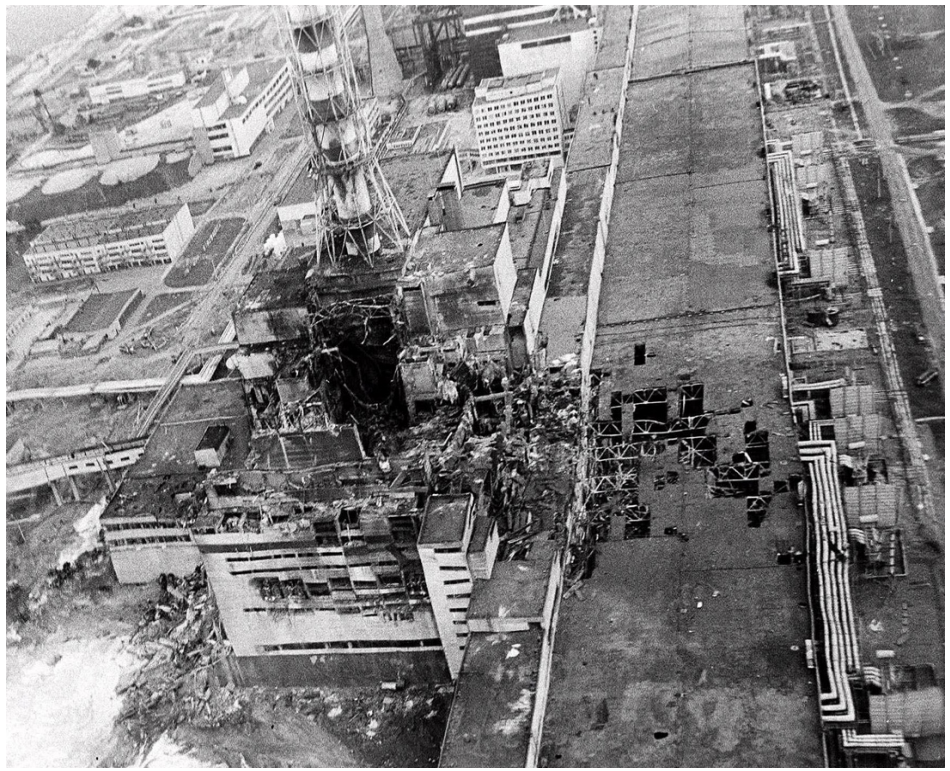
1. Evacuation should have been ordered by 10 am
2. The containment failed after the hydrogen detonation
3. Radiation releases were at least 100 million curries, 10x higher than the NRC estimate

TMI + Minimize = TMInimize

TMInimize (Verb): The actions of regulators and the nuclear industry claiming Minimal health impacts to citizens from radioactive releases after a nuclear meltdown

Later Nuclear Disasters Used the Same Playbook- TMInimize!





Manual for Survival, Kate Brown

Her heroes are not first responders but brave citizen-scientists, independent-minded doctors and health officials, journalists, and activists who fought doggedly to uncover the truth about the long-term damage caused by Chernobyl. Her villains include not only the lying, negligent Soviet authorities, but also the Western governments and international agencies that, in her account, have worked for decades to downplay or actually conceal the human and ecological cost of nuclear war, nuclear tests, and nuclear accidents. Rather than attributing Chernobyl to authoritarianism, she points to similarities in the willingness of Soviets and capitalists to sacrifice the health of workers, the public, and the environment to production goals and geopolitical rivalries.

-The Chernobyl Syndrome, NYBooks.com

The Cover Up

“The information I received was neither timely nor accurate” -
Naoto Kan, former Prime Minister of Japan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