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General Comment

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comments attached

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Attachments

Comments Regarding DTE Electric Company Relicense Application For Fermi 2 copy2

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August 18, 2014

Comments Regarding DTE Electric Company Relicense Application For Fermi 2 Nuclear Reactor near Monroe, MI:
License Renewal Application; Fermi 2; Docket ID: NRC-2014-0109-0003

Submission to:
U.S. Nuclear Regulator Commission
http://www.regulations.gov/#!submitComment;D=NRC-2014-0109-0003

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Thermal loading of the Great Lakes by nuclear Reactors

The Nuclear Regulatory Commission (NRC) has stated in Draft NUREG-2105, volume 1, October 2011, page 2-228: "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels."

There are 48 nuclear reactors in the Great Lakes basin. Each one has added to the thermal load on the Lakes in addition to designed and non-designed radioactive releases. The water usage from Lake Erie is 56,024 million gallons per day (Draft NUREG-2105, volume 1, p. 2-24). Of that, 50,518 million gallons per day are used by power plants. Nuclear power plants release some of that in water vapor and the rest goes back into Lake Erie heated. Without water cooling, reactors would melt their cores and explode as happened to three at Dai-ichi.

Toxic plumes on Lake Erie were a repeat occurrence in August 2014, shutting down water to Toledo and surrounding areas. The only allowable water use was to flush a toilet. We cannot live with safe water being made unavailable from multiple causes and most significantly, in this instance, from Fermi 2 and Davis Bessie, near Toledo, on Lake Erie.

50 Mile Fermi Evacuation Plan

The Fermi site must have a 50 mile evacuation plan that can be implemented instantly and effectively in a nuclear accident that exposes the public to radioactive releases. We need an evacuation plan with routes, destinations, immediate notification, long term housing facilities, competent medical care for radiation exposures, funding for large displaced populations and full disclosure of real time radioactive release measurements. There must be no suppression of information and no delay. To meet this standard, major infrastructure changes must be implemented immediately. We do not accept that we be effectively told to shelter in place and suck it up.

When the three GE Mark 1 reactors exploded and damaged a fourth reactor on March 11, 2011 at Dai-ichi, Fukushima Prefecture, Japan, the U.S. advised Americans within 50 miles to leave.

Statement by U.S. Ambassador John V. Roos on March 16, 2011:
"The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical."
http://www.whitehouse.gov/issues/foreign-policy/japan-earthquake-tsunami

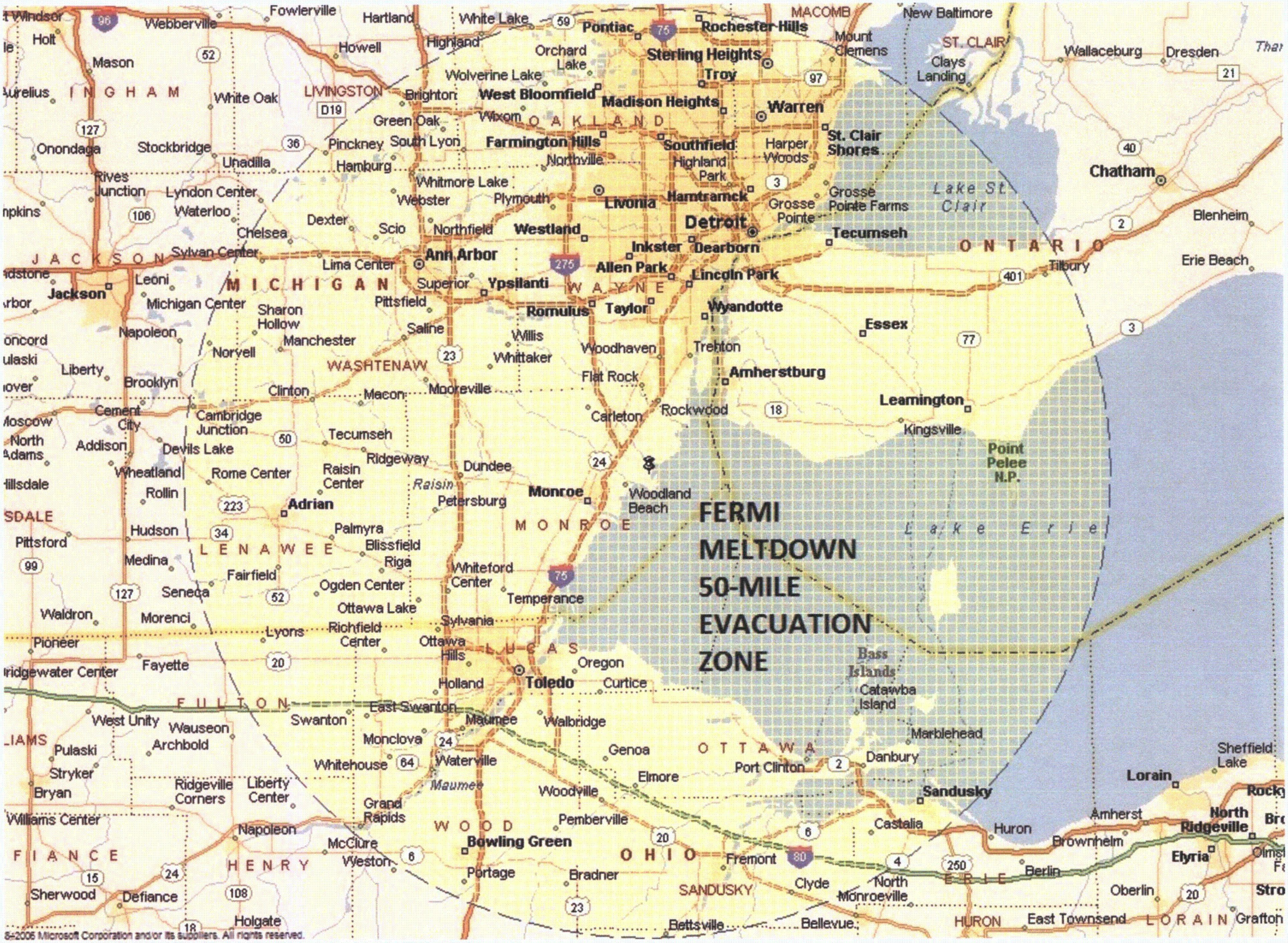
We recognize that a 50 mile evacuation zone could be insufficient and is only a starting point in addressing risk to the public. At Dai-ichi "....What if the already severely- damaged (and, as it seems, slightly leaning) reactor building collapses and the spent fuel pool {no. 4} crashes down, perhaps triggering a spent fuel fire? This could lead to a worst case scenario that was drawn up in March 2011 by Prof. Kondo, Chairman of the Japan Atomic Energy Commission (JAEC), would still apply. Evacuation of over 10 million residents in the wider Tokyo megalopolis within a 250-km radius of Fukushima Daiichi, depending on wind direction, may be required." page 62. http://www.worldnuclearreport.org .

Like Dai-ichi reactors, there are 23 GE Mark 1 reactors in the U.S. including Fermi 2, Monroe, MI. It has a problematic history and the same highly criticized weak containment design. It has a cooling pool 4 stories up outside the containment that is overcrowded with highly radioactive withdrawn fuel rods. Fermi 2 has the same risk of loss of coolant accident from weather related damage or terrorist attack as the Dai-ichi reactors. DTE's proposed unsafe reactor, Fermi 3, offers additional serious risk.

Our present unacceptable situation:

- Can millions of people be quickly evacuated from the proposed 50 mile zone around Fermi? No.
- What provision or plan is there for you and others if you must be evacuated, can't return to your home or your job and have no assets to turn to? None.
- Will the reactor owner or a governmental entity notify the public of an accident in a timely manner? No. That hasn't happened around the world in the 28 reactor accidents on record.
- Would the U.S. government license, finance (federal loan guarantees), and indemnify (Price-Anderson Act) a reactor knowing it is unsafe? Yes. Fermi 1, 23 GE Mark 1 reactors, and NRC's positive appraisal of Fermi 3. Other documented problematic reactors are allowed to continue operating. Unsafe reactors have been documented by Beyond Nuclear http: www.beyondnuclear.org and Nuclear Information and Resource Service http://www.nirs.org/reactorwatch/aging/aginghome.htm

Alliance to Halt Fermi 3 P.O. Box 511001, Livonia, MI 48151 AFTH3.ORG
Vic Macks vicmacks3@gmail.com 586-779-1782 Map created by Art Myatt, Sierra Club



FERMI
MELTDOWN
50-MILE
EVACUATION
ZONE
Fowlerville
Hartland
White Lake
Pontiac
Rochester Hills
MACOMB
New Baltimore
Mount Clemens
ST. CLAIR
Clays Landing
Wallaceburg
Dresden
Webberville
Holt
Mason
Howell
Highland
Orchard Lake
Sterling Heights
Troy
Wolverine Lake
Aurelius
I N G H A M
White Oak
LIVINGSTON
Brighton
West Bloomfield
Madison Heights
Warren
Green Oak
Wixom
O A K L A N D
St. Clair Shores
Onondaga
Stockbridge
Unadilla
Pinckney
South Lyon
Farmington Hills
Southfield
Harper Woods
Hamburg
Northville
Highland Park
Rives Junction
Lyndon Center
Whitmore Lake
Webster
Plymouth
Livonia
Hamtramck
Grosse Pointe
Grosse Pointe Farms
Lake St. Clair
Chatham
Waterloo
Dexter
Scio
Northfield
Westland
Detroit
Chelsea
Tecumseh
Blenheim
Sylvan Center
Ann Arbor
Inkster
Dearborn
J A C K S O N
Lima Center
Allen Park
O N T A R I O
Tilbury
Erie Beach
Leoni
M I C H I G A N
Superior
Ypsilanti
W A Y N E
Lincoln Park
Jackson
Michigan Center
Pittsfield
Romulus
Taylor
Wyandotte
Sharon Hollow
Essex
Napoleon
Saline
Willis
Norvell
Manchester
Whittaker
Woodhaven
Trenton
Liberty
WASHTENAW
Amherstburg
Brooklyn
Flat Rock
Clinton
Macon
Mooreville
Leamington
Cement City
Carleton
Rockwood
Cambridge Junction
Kingsville
North Adams
Addison
Tecumseh
Devils Lake
Dundee
Point Pelee N.P.
Ridgeway
Wheatland
Rome Center
Raisin Center
Raisin
Monroe
Woodland Beach
Hillsdale
Rollin
Petersburg
Adrian
M O N R O E
Lake Erie
Hudson
Palmyra
Pittsford
L E N A W E E
Blissfield
Medina
Riga
Whiteford Center
Fairfield
Ogden Center
Seneca
Temperance
Waldron
Morenci
Ottawa Lake
Sylvania
Richfield Center
Lyons
Pioneer
Ottawa Hills
L U C A S
Bass Islands
Fayette
Oregon
Holland
Toledo
Curtice
Catawba Island
F U L T O N
East Swanton
West Unity
Swanton
Maumee
Walbridge
Wauseon
Marblehead
Archbold
Monclova
Pulaski
Genoa
O T T A W A
Sheffield Lake
Whitehouse
Waterville
Port Clinton
Danbury
Stryker
Elmore
Lorain
Ridgeville Corners
Liberty Center
Bryan
Maumee
Woodville
Sandusky
Grand Rapids
Williams Center
Pemberville
Castalia
Amherst
North Ridgeville
Napoleon
Huron
Brownhelm
W O O D
McClure
Bowling Green
Weston
O H I O
Fremont
Elyria
H E N R Y
Berlin
Portage
Bradner
E R I E
North Monroeville
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Bellevue
HURON
East Townsend
L O R A I N
Grafton
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Radiation Releases From Nuclear Reactors

National Academy of Sciences, Committee on the Biological Effects of Ionizing Radiation (BEIR) has stated that all ionizing radiation including low levels can produce broad spectrum non-malignant illnesses and cancer, morbidity, as well as genetic mutations. The BEIR report defines low level radiation as near zero to 100 millisieverts (mSv).
http://www8.nationalacademies.org/onpinews/newsitem.aspxRecordID=11340
See also: http://www.radiation.org/about/index.html

This is ignored, dismissed, and trivialized by the NRC recurrently over decades of statements. Fermi 2, like all reactors has stipulated designed radiation releases into the biosphere continuously. Degraded equipment, operator error, and accidents expand the public exposure to ionizing radiation. The public is not provided with actual real time measurements and is misled by NRC/industry statements conflating "allowable" limits with "safe" or "legal" limits. "Legal limit" is also misleading in that there is no punishment, sanction, or penalty for exceeding it. The cumulative effect of release exposures, varying in dose, experienced over time, are addressed by the NRC as though each release were one time only in impact on human cell tissue and the rest of the biosphere. The reality ignored by the NRC is that years or a lifetime of exposure to releases from nuclear reactors, added to the fallout from nuclear weapons production and testing, nuclear medicine, X rays, (all man made sources) have been producing illness, morbidity, and genetic mutations. It is convenient for the NRC, the National Nuclear Security Administration(NNSA) and the nuclear industry to address a given ionizing radiation exposure as though it existed in isolation and is not additive to all of the rest of releases and ongoing exposures around the region, the nation, and the world currently and historically and to behave as though once forgotten, ionizing radiation ceases to exist.

There is a cynicism in the NRC, the NNSA, and the nuclear industry not being upfront in stating clearly to the public that the decision was made in the 1940s, and continuing in the present, that there will be man made ionizing radiation releases into the biosphere, that those releases will be whatever the nuclear regulators/industry decides and that the exposures will increase. Indeed, they have increased. Ionizing radiation and radionuclide particles move about the world, are ingested and breathed in and bioaccumulate up the food chain. They assault human cell tissue and the rest of the biosphere, in accord with their dose and half lives. A problematic issue, obfuscated, unmeasured, unstudied——to that extent and intentional——doesn't exist in the public mind. A result desired and intended by nuclear advocates beginning with the Manhattan Project.

Cancer Deaths from Fermi 2

Center for Disease Control statistical analysis shows that there is a significantly higher incidence of cancer deaths for Monroe, MI residents compared with incidences for the U.S. as a whole. This increase in Monroe cancer deaths correlates with the Fermi 2 going to full power. This is ignored by the NRC and Detroit Edison:

RPHP

Radiation and Public Health Project
Joseph J. Mangano, MPH, MBA, Executive Director
716 Simpson Avenue, Ocean City NJ 08226
odiejoe@aol.com
www.radiation.org
609-399-4343

Joseph J. Mangano, MPH, MBA, is Director, Secretary, and the Executive Director of the Radiation and Public Health Project.

Mr. Mangano is a public health administrator and researcher who has studied the connection between low-dose radiation exposure and subsequent risk of diseases such as cancer and damage to newborns.
He has published numerous articles and letters in medical and other journals in addition to books, including Low Level Radiation and Immune System Disorders: An Atomic Era Legacy. There he examines the connection between radiation exposure and current widespread health problems.
RISING LOCAL CANCER RATE SUGGESTS LINK WITH FERMI REACTOR
January 14, 2009 - The cancer death rate in Monroe County has been rising since the late 1980s, when the Fermi 2 nuclear reactor began operating, according to a new analysis.

The rise in cancer has been sharpest among children and adolescents, who are most susceptible to the harmful effects of radiation exposure. The analysis uses official data from the U.S. Centers for Disease Control and Prevention.

"The increasing cancer death rate among Monroe County residents, especially young people, suggests a link with the radioactive chemicals emitted from the Fermi reactor," says Joseph J. Mangano MPH MBA, Executive Director of the Radiation and Public Health Project research group. "Because Monroe County has a low risk population that is well educated, high income, and has few language barriers, rising cancer rates are unexpected, and all potential causes should be investigated by health officials."

Fermi 2 reactor began "operating" June 21, 1985. However, it ran very little after the initial low-power start-up until a warranty run in January of 1988, marking the commercial start-up of the reactor. In the early 1980s, the Monroe County cancer death rate was 36th highest of 83 Michigan counties, but by the early 2000s, it had moved up to 13th highest. *From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S.*

All nuclear reactors produce electricity by splitting uranium atoms, which creates high energy needed to heat water. This process also creates over 100 radioactive chemicals, not found in nature, including Strontium-90, Cesium-137, and Iodine-131.

While most of these chemicals are retained in reactors and stored as waste, a portion is routinely released into the local air and water. They enter human bodies through breathing and the food chain, and raise cancer risk by killing and injuring cells in various parts of the body. They are especially harmful to children.

The findings come at a time when a new nuclear reactor has been proposed at the Fermi plant. The original Fermi 1 reactor, which was the site of a "Partial Core-Melt Accident" in 1966, shut permanently in 1972.

DATA ON CANCER RISK FROM FERMI 2 RADIOACTIVE EMISSIONS

- The Fermi 2 reactor is located in Monroe County, and started on June 21, 1985, not becoming fully operational until January 1988.
- Fermi 2 came close to a meltdown on March 28, 2001 and August 14, 2003. (1)
- Fermi 2, like all reactors, routinely emits over 100 radioactive chemicals into air and water.
-Each of these chemicals causes cancer, and is most harmful to infants and children.
- For cancer deaths for all ages (whites only), Monroe County ranked
  36th highest of 83 Michigan counties in 1979-1983 (before startup)
  13th highest of 83 Michigan counties in 2000-2005 (latest data) (2)
- The Monroe County cancer death rate age 0-24
  was 21.1% below the U.S. in 1979-1988 (before/during startup)
  was 45.5% above the U.S. in 1989-2005 (after startup) (3)

Monroe County has no obvious cancer risk. It has a high income, low poverty, well educated population with few language barriers and access to excellent medical care in nearby Detroit. (4) Thus, an increase in cancer (especially to children) is unexpected. This change should be investigated, and one potential cause should be radioactive emissions from Fermi.

Sources:

1. Fermi 2 incurred "near miss" accidents on March 28, 2001 (emergency diesel generator was inoperable for over 7 days) and August 14, 2003 (loss of offsite power due to northeast blackout). Source: Greenpeace USA. An American Chernobyl: Nuclear "Near Misses" at U.S. Reactors Since 1986. www.greenpeace.org, April 26, 2006.

2. U.S. Centers for Disease Control and Prevention, http://cdc.wonder.gov, underlying cause of death. Death rates are adjusted to 2000 U.S. standard population. Includes ICD-9 codes 140.0-239.9 (1979-1983) and ICD-10 codes C00-D48.9 (2000-2005). Whites account for over 95% of Monroe residents.

3. Cancer Death Rates, Monroe County vs. U.S.
1979-1988 and 1989-2005, age 0-24

	Monroe County		Deaths/100,000 Pop.		
Period	Cancer Deaths	Avg. Pop.	Monroe	U.S.	%vs. US
1979-1988	22	56,234	3.91	4.96	- 21.2%
1989-2005	42	51,407	4.86	3.79	+45.5%

Source: U.S. Centers for Disease Control and Prevention, http://cdc.wonder.gov, underlying cause of death.
Includes ICD-9 codes 140.0-239.9 (1979-1983) and ICD-10 codes C00-D48.9 (2000-2005). Increase in rate significant at p<.05.

4. Demographic Comparison, Monroe County vs. U.S.

Indicator	Monroe	U.S.
2006 Population	155,035	299,398,484
2000 % Foreign Born	1.9	11.1
2000 % Language other than English spoken at home, age 5+	4.0	17.9
2000 % High School graduates, age 25+	83.1	80.4

2000 % Homeownership	81.0	66.2
2004 Median Household Income	$53,838	$44,344
2004 % Below Poverty	8.7	12.7

Source: U.S. Census Bureau, www.census.gov, 2000 population, State and County Quick facts

Nuclear Accidents, Explosions and Meltdowns Are Not Only Historical But Also Current Events In Accord With The Dose and Half Lives of The Radionuclides Released

Kyshtym: Deaths occurred in the Soviet Union From this Nuclear Reactor Explosion.
"...Catastrophe at Kyshtym Soviet Union Ural Mountains 1957 a massive explosion at radioactive dump site: "There was an enormous explosion, like a violent volcano," Medvedev explained. "The nuclear reactions had led to an over-heating in the underground burial grounds. The explosion poured radioactive dust and materials high up into the sky." The human fallout was "terrible. . . . Tens of thousands of people were affected, hundreds dying, though the real figures have never been made public. The large area, where the accident happened, is still considered dangerous and is closed to the public." p.166 http://www.ratical.org/radiation/KillingOurOwn/KOO.pdf
This is rated 6 (scale 1 to 7) on the International Nuclear Events Scale.

Deaths at Three Mile Island March 28, 1979 http://www.ratical.org/radiation/KillingOurOwn/KOO.pdf
"... Radiation escaped through the containment. Radioactive water leaked into the Susquehanna River. Finally, a hydrogen bubble developed in the core, apparently threatening an explosion. ....unknown quantities of radiation escaped into the air of central Pennsylvania." (p.186)

"....It was impossible to tell how much radiation really escaped. The monitors merely recorded a minimum amount..." according to NRC " ....Inside the building readings showed a minimum of a million millirems per hour, a lethal dose. On site, the day of the accident, monitors 1000 feet from the vent stack showed levels of 365 millirems of beta and gamma rays per hour. A helicopter directly over the vent stack measured emissions three times as high. Even those measurements were "very inconclusive," said Gibson. They showed dose rates "only at the moments the measurements were made." Without full knowledge of weather patterns, he admitted, "we don't know if they were made at the appropriate locations." Thus Gibson had told his NRC superiors that one of the key methods of measuring emissions—the stack monitors—had been essentially useless during and after the accident." p. 188 This is rated 5 on the International Nuclear Events Scale.

Animals died at Three Mile Island. People Died at Three Mile Island. See Chapters 13 and 14.
"In December of 1979, Sternglass carried his conclusions much further. In a paper delivered to the Fifth World Congress of Engineers and Architects at Tel Aviv, he said that data from the U.S. Bureau of Vital Statistics showed that there were "242 [infant] deaths (from TMI) above the normally expected number in Pennsylvania and a total of 430 in the entire northeastern area of the United States," a rise of clear statistical significance. The linkage with TMI was clear because "large amounts of radioactive Iodine-131 were released from the plant" and the peak of infant mortality came within a matter of months thereafter. The greatest rises took place near the plant, with effects decreasing as a function of distance away from Harrisburg."
".....But I-131 was not the only radioactive element released from TMI—nor were infants the only humans likely to be harmed. Strontium 90, cesium 137, noble gases, and other disease-causing isotopes may also have escaped. Overall, said Sternglass, increases in cancers, leukemia, and a wide range of other diseases were "likely to occur.....many thousands over the next 10 to 20 years."
Additional Health studies at Three Mile Island: http://www.tmia.com/taxonomy/term/12

Chernobyl 1986: meltdown with multiple explosions and release of radioactive material. 100,000 people evacuated from the immediate area and 300,000 from areas of heavy fallout in Ukraine, Belarus, and Russia. Exclusion zone of approximately 1,000 square miles indefinitely off limits for human habitation.
Excerpts from: CHERNOBYL Consequences of the Catastrophe for People and the Environment Yablokov, Vassily Nesterenko, and Alexey Nesterenko published by license from New York Academy of Sciences March 15, 2011 http://www.strahlentelex.de/Yablokov%20Chernobyl%20book.pdf

"Emissions from this one reactor exceeded by hundredfold the radioactive contamination of the bombs dropped on Hiroshima and Nagasaki. No citizen of any country can be assured that he or she can be protected from radioactive contamination. One nuclear reactor can pollute half the globe. Chernobyl fallout covered the entire Northern Hemisphere..." page 2

Thousands of reports and studies in Russia, Belarus, and Ukraine document a wide range of illness and death from the Chernobyl explosion. Excerpts below are marked with page notation where the subject addressed is found in the book:

p. 27 "....contamination not less than 300 years for Cs-137 and Sr-90, more than 200,000 years for Pu, and several thousand years for Am-241.....tens of millions of people will live under measurable chronic radioactive contamination for decades to come...."
p. 32 "....nearly 400 million human beings have been exposed to Chernobyl's radioactive fallout and for many generations, they and their descendants will suffer the devastating consequences...."
42-50 ".... comparing heavily contaminated with less contaminated areas: general morbidity increased significantly....range of illness increased: Weakness, dizziness, headache, fainting, nose bleeds, fatigue, heart arrhythmia's, stomach pain, vomiting, heartburn, loss of appetite, allergy, chronic gastroenteric pathology, dodentitis, gallbladder inflammation, vascular and heart syndromes, low birth weight...."

p. 55 ".... Chernobyl catastrophe produced accelerated aging. multiple illnesses characteristic of aging were seen many years sooner...."

p. 58 ".... there is a high incidence of non-malignant diseases in people heavily contaminated including: brain damage, premature cataracts, tooth and mouth abnormalities, blood, lymphetic, heart, lung, gastrointestinal, urologic, bone, and skin diseases. endocrine dysfunction, thyroid disease including cancer, genetic damage and birth defects, immunological abnormalities and increases in viral, bacterial and parasitic disease...."

p. 65 ".... a common reason for functional impairment of blood, blood forming organs, and circulatory system is radioactive destruction of the endothelium, the covering surface of vessels...."
"....incidence of chromosomal aberrations is significantly higher in all the territories contaminated by Chernobyl...."

p. 71 ".... there is a high increases of Down Syndrome, 30-49%..."

p.75 "....the 2nd and 3rd generations of children whose parents were irradiated by the atomic bomb explosion in Japan in 1945 suffered 10 fold more circulatory system diseases and impaired liver function and 3.3 fold more respiratory system illness than a control group...."

p. 76 "The overwhelming majority of Chernobyl induced genetic changes will not become apparent for several generations."

p. 77 "The Chernobyl radiation is genetically much more dangerous than that released in Hiroshima and Nagasaki as the quantity of radionuclides emitted from the chernobyl meltdown was several hundred fold higher and there were more different kinds of radionuclides."

"The genetic consequences of the Chernobyl catastrophe will impact hundreds of millions of people, including:(a)those who were exposed to the first release of short-lived radionuclides in 1986, which spread worldwide...(b) those who live and will continue to live in the territories contaminated by Sr-90 (strontium)and Cs-137 (cesium), as it will take no fewer than 300 years for the radioactive level to decrease to background; (c) those who will live in the territories contaminated by Pu (plutonium) and Am (Americum) as millennia will pass before that deadly radioactivity decays; and (d)children of irradiated parents for as many as seven generations (even if they live in areas free from Chernobyl radionuclide fallout)...."

83 "In all of the contaminated territories, there is a marked increase in nonmalignant thyroid diseases....delayed healing of wounds and ulcers, delay in growth of hair, dryness, fragility, hair loss, increased susceptibility to respiratory infections, night blindness, ringing in the ears, headaches, fatigue and lack of energy, lack of appetite (anorexia) delayed growth in children, male impotence, increased bleeding...."

p. 87 ".... Chernobyl radiation suppresses immunity..."

p. 92 "....marked increase in respiratory system morbidity everywhere in the territories contaminated by Chernobyl."

p. 96 "For children of the hibakusha who were not irradiated directly, the incidence of respiratory system illnesses was higher compared to controls some decades after the bombardment."

p. 102 "Urogenital tract diseases and reproductive disorder: abnormalities in spermatozoa, reproductive failures, birth abnormalities in children... '

p. 102 ".... bone and muscle diseases: cases of children born practically without bones ("jelly fish-children"), a condition seen previously only in the Marshall Islands after the nuclear tests of the 1950s"

p. 105 "....diseases of the nervous system and sense organs and their impact on mental health: low levels of ionizing radiation changes in both central and autonomic nervous systems and can cause encephalopathy.....significant morbidity was documented in contaminated territories...."

p.112 "...45% of children born to mothers who went through Hiroshima and Nagasaki nuclear bombardment were diagnosed with intellectual retardation...."

p. 133 "The occurrence of congenital malformations continues to increase in several of the contaminated territories and correlates with the level of irradiation..."

p. 162 "There are 2 ways to define the scale of cancer morbidity associated with the Chernobyl catastrophe: (1) on the basis of calculated received doses (with application of appropriate risk factors) and (2) by direct comparison of cancer morbidity in the heavily and less contaminated territories."

p.174 "In Connecticut there were two separate fallouts of Chernobyl radionuclides (in the middle of May and the second half of June, 1986), resulting in a 7 to 28-fold increased level of I-131 in milk.

The rate of thyroid cancer among Connecticut children under the age of 15 years rose sharply (from 0.16 to 0.31 per 100,000) from 1985-1989 to 1990-1992. During the same period rates of thyroid cancer for all age groups jumped to 23% (from 3.46 to 4.29 per 100,000), after 10 previous years without change."

p.174 "The added risk of thyroid cancer after Hiroshima and Nagasaki radiation was highest 10-15 years later, with cases appearing 40-50 years afterward."

p. 192 " Mortality after Chernobyl: "A detailed study reveals that 3.8-4% of all deaths in the contaminated territories of Ukraine and Russia from 1990 to 2004 were caused by the Chernobyl catastrophe. The lack of evidence of increased mortality in other affected countries is not proof of the absence of effects from the radioactive fallout. Since 1990, mortality among liquidators (mitigation workers) has exceeded the mortality rate in corresponding populations groups. From 112,000 to 125,000 liquidators died before 2005---that is, some 15% of the 830,000 members of the Chernobyl cleanup teams. The calculations suggest that the Chernobyl catastrophe has already killed several hundred thousand human beings in a population of several hundred million that was unfortunate enough to live in territories affected by the fallout. The number of Chernobyl victims will continue to grow over many future generations."

210 "The overall mortality for the period april 1986 to 2004....estimated at 985,000 deaths....Given the half-life of the two main radionuclides (Cs-137 {Cesium} and Sr-90 {Strontium}),of approximately 30 years each, the radioactive load in the contaminated territories will decrease about 50% for each human generation. The concentration of Pu {Plutonium},Cl-36 {Chlorine}, and Tc-99 {Technetium} will remain practically the same forever (half-lives consequently more than 20,000 and 200,000 years), and the concentration of Am-241 {Americum} which is a decay product of Pu-241, will increase over several generations."

p. 223 "Air particulate activity over all of the Northern Hemisphere reached its highest levels since the termination of nuclear weapons testing---sometimes up to 1 million times higher than before the chernobyl contamination. There were essential changes in the ....structure of the surface air in heavily contaminated territories....Many years after the catastrophe aerosols from forest fires have dispersed hundreds of kilometers away...."

p. 225 "Three Chernobyl clouds entered eastern Canada...(in 1986). The fallout included..."(15 radionuclides).

p. 226 3 radionuclides from Chernobyl reached the U.S. and were measured and recorded by the U.S. EPA.

p. 232 "Levels of radioactive contamination even in North America and Asia are above the maximun levels that were found in the wake of weapons testing in the 1960s"

p. 237 "Chernobyl irradiation has caused structural anomalies and tumor like changes in many plant species. Unique pathological complexes are seen...."

p. 255 "Radioactive shock when the Chernobyl reactor exploded in 1986 combined with chronic low dose contamination has resulted in morphologic, physiologic, and genetic disorders in every animal species that has been studied----mammals, birds, amphibians, fish, and invertebrates."

p. 273 "...an enormous amount of many different radionuclides was absorbed by animals through food, water and air. Levels were sometimes hundreds of times higher than precatastrophe ones....The levels of incorporated radionuclides in some areas of Europe remain dangerous for mammals, birds, amphibians, and fish."

287 "The reluctance on the part of officialdom to acknowledge the truth about Chernobyl's consequences has led to concerned citizens organizing to find additional sources of information to help those who are suffering. Hundreds of such public local, national, and international organizations have been created,,,"

p. 287 Andrei Sakharov and 2 others "....in 1987 initiated the Belorussian Institute for Radiation Safety (BELRAD), an independent public organization devoted to helping Belorussian children---those suffering most from the catastrophic contamination. BELRAD has collected an extensive database for 24 years and is unique as a center for scientific and practical information."

p .289 "In many European countries level of I-131,Cs-134/137, Sr-90 and other radionuclides in milk, dairy products, vegetables, grains, meat, and fish increased dramatically (sometimes as much as 1,000 fold) immediately after the catastrophe. Up until 1991, the United States imported food products with measurable amounts of Chernobyl radioactive contamination, mostly from Turkey, Italy, Austria, West Germany, Greece, Yugoslavia, Hungary, Sweden, and Denmark....Given that more than 90% of the current radiation fallout is due to Cs-137, with a half-life of about 30 years, we know that the contaminated areas will be dangerously radioactive for roughly the next three centuries."

311 "Owing to internally absorbed radionuclides, radiation levels for individuals living in the contaminated territories of Belarus, Ukraine, and Russia hae been increasing steadily since 1994."

p. 316 "Today the most serious contaminating agents are Cs-137 and Sr-90. In coming years the situation will change and Am-241 will present a serious problem....constant monitoring and control (will be) required for Cs-137 and Sr-90 for at least 150-300 years....The contamination from the wider spectrum of radioisotopes is dynamic and will require constant monitoring and control essentially forever."

p. 318 "More than 50% of Chernobyl's radionuclides were dispersed outside of Belarus, Ukraine, and European Russia.....nearly 5 million people are still being exposed to dangerous contamination. The increase in morbidity, premature aging, and mutations is seen in all the contaminated territories that have been studied. The increase in the rates of total mortality for the first 17 years in European Russia was up to 3.75% and in Ukraine is was up to 4.0% Levels of internal irradiation are increasing owing to plants absorbing and recycling Cs-137, Sr-90, Pu, and Am.

p. 319 The claim by the International Atomic Energy Agency (IAEA), the united Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and several other groups that the Chernobyl radioactive fallout adds "only" 2% to the natural radioactive background ignores several facts: First, many territories continue to have dangerously high levels of radiation. Second, high levels of radiation were spread far and wide in the first weeks after the catastrophe. Third, there will be decades of chronic low-level contamination after the catastrophe. Fourth, every increase in nuclear radiation has an effect on both somatic and reproductive cells of all living things....There is no justification for the fact that specialists from IAEA and the World Health Organization (WHO) (Chernobyl Forum, 2005) completely neglected to cite the extensive data on the negative consequences of radioactive contamination in areas other than Belarus, Ukraine, and European Russia, where about 57% of the Chernobyl radionuclides were deposited."

50% of Chernobyl's fallout was outside of European Russia, Belarus, and the Ukraine. Heavily contaminated agricultural land taken out of use: Belarus, 265,000 hectares (654,550 acres); Ukraine, 130,000 hectares (321,100 acres); Russia, 17,000 hectares (41,990 acres) total equals 1,017,640 acres withdrawn (page 312)

Chernobyl: Consequences of the catastrophe 25 years later
by Janette D. Sherman, M.D., and Alexey V. Yablokov, Ph.D.
published April 26, 2011 article and interview by Democracy Now at
http://sfbayview.com/2011/chernobyl-consequences-of-the-catastrophe-25-years-later/print/

In the first 25 years after the multiple Chernobyl explosions, mitigating costs reached 500 billion dollars and Belarus spends 20% of its national annual budget to mitigate some of the consequences.

"Data from multiple scientists estimate the overall mortality from the Chernobyl catastrophe, for the period from April 1986 to the end of 2004, to be 985,000, similar to those of Gofman (1994a) and Bertell (2006) and a hundred times more than the WHO/IAEA estimate."

An agreement signed on May 28, 1959, at the 12th World Health Assembly obligates the World Health Organization (WHO) to submit public releases bearing on nuclear energy to the International Atomic Energy Agency (IAEA) for approval. The IAEA's mandate is to promote nuclear energy. Chernobyl is rated 7 on the International Nuclear Events Scale.

Dai-ichi, Fukushima
Three GE Mark 1 reactors exploded and damaged a fourth reactor and 2 cooling pools holding withdrawn fuel rods on March 11, 2011. Fatal doses of radiation have been acknowledged near reactors 1 and 2 and measuring devices gave their maximum possible reading (off scale) of 10 sieverts per hour. This followed crippling explosions that destroyed the reactor buildings. The reactors have continued to spew radiation since the disaster. Food and agricultural land contamination prevents use of land and food crops and one group of 1000 children were found to have radioactive iodine thyroid contamination. Evidence shows that cooling pipes were known to be deteriorated, and that the earth quake caused loss of cooling and the melt down before the tsunami hit which in turn knocked out the back-up generators. This puts at risk all of the other aging reactors of this same design in Tokyo as well as here in the U.S---including Fermi 2---., especially those on earth quake faults. Fall out from Dai-ichi reactors has been measured across the U.S.
The Japanese government and the IAEA are protecting the nuclear industry and not the people of Japan by claiming that Fukushima is stable when it is not; by substantially raising the "allowable limit" of radiation for the people; by allowing return to evacuated areas; and by planning on incinerating radioactive material and dumping the radioactive ash into Tokyo Bay. The U.S. State Department exuded support stating that Japan had made "the right decision". The Japanese people will now be "allowed" to experience up to 20 millisieverts. This is 10 times higher than allowable dose for U.S. nuclear workers. The claim that a "cold shut down" has been achieved is misleading. The jury rigged piping cooling the damaged reactors is not earth quake safe and there is a high likelihood of an earth quake that would return the reactors to meltdown again. The IAEA is not a UN agency as is often claimed. It's purpose as expressed in article 2 of its mission statement is to "...seek to accelerate and enlarge atomic energy..." around the world. The current head of the IAEA is a former Japanese nuclear regulator. Japan has and continues to put large amounts of radiated water into the ocean. The assault on people and the rest of the biosphere represented by the Fukushima catastrophe is a current reality that will be played out into the indefinite future. This is rated 7 on the International Nuclear Events Scale.
http://fairewinds.com/content/tepco-believes-mission-accomplished-regulators-allow-radioactive-dumping-tokyo-bay

"...Both short-lived radioactive elements, such as iodine-131, and longer-lived elements — such as cesium-137, with a half-life of 30 years — can be absorbed by phytoplankton, zooplankton, kelp, and other marine life and then be transmitted up the food chain, to fish, marine mammals, and humans. Other radioactive elements — including plutonium, which has been detected outside the Fukushima plant — also pose a threat to marine life....The Tokyo Electric Power Company (TEPCO) has reported that seawater containing radioactive iodine-131 at 5 million times the legal limit has been detected near the plant. According to the Japanese news service, NHK, a recent sample also contained 1.1 million times the legal level of radioactive cesium-137. Studies from previous releases of nuclear material in the Irish, Kara and Barents Seas, as well as in the Pacific Ocean, show that such radioactive material does travel with ocean currents, is deposited in marine sediment, and does climb the marine food web. In the Irish Sea — where the British Nuclear Fuels plant at Sellafield in the northwestern United Kingdom released radioactive material over many decades, beginning in the 1950s — studies have found radioactive cesium and plutonium concentrating significantly in seals and porpoises that ate contaminated fish. Other studies have shown that radioactive material from Sellafield and from the nuclear reprocessing plant at Cap de la Hague in France have been transported to the North Atlantic and Arctic Oceans. A study published in 2003 found that a substantial part of the world's radioactive contamination is in the marine environment....So far, the Japanese government and TEPCO have provided only limited data on marine contamination from the Fukushima plant. Given the emergency situation, independent monitoring along the coast is difficult, said Jan Beránek, director of Greenpeace International's nuclear energy project. On April 5, the Japanese government set its first standards for allowable levels of radioactive material in seafood. A number of countries have banned seafood imports from Japan. The U.S. has barred food imports from the prefectures closest to Fukushima and the Food and Drug Administration says it is closely monitoring imported food products, including seafood, for radiation contamination....
http://e360.yale.edu/feature/radioactivity_in_the_ocean_diluted_but_far_from_harmless/2391/

The New York Times reported on 8-8-11: "....In interviews and public statements, some current and former government officials have admitted that Japanese authorities engaged in a pattern of withholding damaging information and denying facts of the nuclear disaster — in order, some of them said, to limit the size of costly and disruptive evacuations in land-scarce Japan and to avoid public questioning of the politically powerful nuclear industry. As the nuclear plant continues to release radiation, some of which has slipped into the nation's food supply, public anger is growing at what many here see as an official campaign to play down the scope of the accident and the potential health risks....Meltdowns at three of Fukushima Daiichi's six reactors went officially unacknowledged for months. In one of the most damning admissions, nuclear regulators said in early June that inspectors had found tellurium 132, which experts call telltale evidence of reactor meltdowns, a day after the tsunami — but did not tell the public for nearly three months. For months after the disaster, the government flip-flopped on the level of radiation permissible on school grounds, causing continuing confusion and anguish about the safety of schoolchildren here in Fukushima...On July 4, the Atomic Energy Society of Japan, a group of nuclear scholars and industry executives, said, "It is extremely regrettable that this sort of important information was not released to the public until three months after the fact, and only then in materials for a conference overseas."
http://www.nytimes.com/2011/08/09/world/asia/09japan.html?_r=1&sq=japan%20radiation&st=cse&scp=1&pagewanted=print#
Japan, in response to the Dai-ichi reactor explosions, has raised the civilian exposure to nuclear radiation 20 times higher to 20 millisieverts per year to allow habitation of contaminated areas. At that rate, one young girl in every 100 would develop cancer for every year they are exposed. However, examining BEIR VII, National Academies of Science, Committee on the Biological Effects of Ionizing

Radiation, in relation to 20 millisieverts yearly exposure, at least one out of 20 girls with that exposure for 5 years will develop cancer. http://www.fairewinds.org/?s=Cancer+Risk+To+Young+Children+Near+Fukushima+Daiichi+Underestimated

"Total atmospheric releases from Fukushima so far are between 5.6 and 8.1 times that of Chernobyl, according to the 2013 World Nuclear Industry Status Report. Prof. Komei Hosokawa, who wrote the Fukushima section, (said)....Japan has decided that fish contaminated with fewer than 100 Becquerels per kilogram (Bq/kg) of cesium-137 is good enough to eat. Some local officials have set a stricter bar of 50 Bq/kg.
In the U.S. the permissible level of cesium in food is 1,200 Bq/kg. Canada allows 1,000 Bq/kg. The difference is startling. The huge discrepancy allows importation by the U.S. and Canada of what Japan considers highly contaminated fish, vegetables and meat. Rice, fish, beef and other Japanese exports poisoned by nuclear power's single worst nightmare is doubtless being consumed in the United States....The Seattle Times reported last October that researchers found small amounts of Fukushima's cesium in albacore tuna caught off the coasts of Washington and Oregon. The albacore warning followed the May 2012 and Feb. 2013 findings of cesium-contamination in Blue fin tuna caught off California.
The Huffington Post said Aug. 28 that out of 170 types of fish tested in the Fukushima area, 42 species were put off limits. CBS News put it a little differently Aug. 20, noting that in the same region only 16 types of fish are considered safe to catch, compared with 150 types before the catastrophe. Japanese public television reported July 11 that sea bass were found with 1,037 Bq/kg, or ten times the allowed contamination. The Tokyo daily Asahi Shimbun noted Aug. 29, 2013 that a greeling had 25,800 Bq/kg cesium, an all-time record in the 2 ½ years since the radiation gusher began. Pacific cod and black sea bream had 3,300 Bq/kg...." http://www.counterpunch.org/2013/10/23/fukushimas-radiation-gusher/print

7-24-14 "TEPCO has announced that they estimate some 1.1 trillion becquerels of radiation was released during debris cleanup operations at the Fukushima Dai-ichi Unit 3 reactor. According to TEPCO's estimates the removal work generated 280 billion becquerel per hour releases.
Some of the radioactive cesium which was released during the debris removal operations was found over 12 miles away in Minami Soma rice fields..."
http://enformable.com/2014/07/fukushima-daiichi-unit-3-debris-removal-operations-released-280-billion-becquerels-per-hour/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+Enformable+%28Enformable%29

Seventy-nine U.S. sailors or their relatives sued the plant operator, Tokyo Electric Power Co., for $1 billion in medical costs and damages this week, alleging that the sailors were exposed to dangerous levels of radiation when the aircraft carrier USS Ronald Reagan was diverted to Japan to help with evacuation and rescue efforts. http://www.nbcnews.com/news/world/two-quakes-strike-near-fukushima-us-sailors-sue-over-cleanup-n25271

"Fukushima Meltdown Driving Increased Abnormalities Among US Infants....According to a new study (.pdf) published in the Open Journal of Pediatrics, children born in Alaska, California, Hawaii, Oregon and Washington between one week and 16 weeks after the meltdown began are 28 percent more likely to suffer from congenital hypothyroidism (CH) than were kids born in those states during the same period one year earlier...."
http://www.commondreams.org/search/site/Fukushima%20Meltdown%20Driving%20Increased%20Abnormalities%20Among%20US%20Infants

Other reactor incidents, malfunctions and accidents:

Chalk River, Ontario: 1952 and 1958: 1000 rads per hour exposure to a large number of people and area for days as a fuel rod had burned. 300 Canadian Armed Forces personnel were brought in for the clean up effort. This is rated 5 on the International Nuclear Events Scale (INES).

Idaho Falls, Idaho 1955; 1961 An explosion occurred and worker radiation meters read 1000 rads. Three workers were dead, one impaled on a fuel rod stuck to the ceiling. Even those well suited in protective clothing and limited to 60 seconds time of exposure in addressing the crisis absorbed 30 rads of radiation.

1957 Windscale, England: Information withheld from the public. The public lied to. Contaminated food, animals and agricultural land. A cover up occurred and fallout reached London, 300 miles away. This is rated 5 on the International Nuclear Events Scale.

1958 Vinca, Serbia A criticality excursion radiated 6 scientists with doses of 2-4 Sv This was rated 5 on the International Nuclear Events Scale.

1959 Santa Susana, CA Partial core meltdown resulting in release of radioactive gases.

1960 Westmoreland County, Pennsylvania A core meltdown resulted in release of 2 million gallons of contaminated water, some of which resulted in Sr-90 detected in ground water and soil contamination.

1964 Charlestown, Rhode Island A criticality accident in which one worker was exposed to 10,000 rad of radiation and two others 100 rad.

1966 The Soviet ship Lenin experienced a (likely) meltdown resulting in the death of at least 30 crew and the dumping of the reactor and fuel into the Kara Sea.

1967 Dumfries and Galloway, Scotland Fuel meltdown and fire.

1969 Lecens, Switzerland Power excursion contaminated containment area resulting in it being permanently sealed off.

1975 Greifswald, Germany Excessive heating damaged 10 fuel rods, attributed to poor construction. INES level 3.

1977 Jaslovske Bohunice, Slovakial Accident damaged fuel integrity and resulted in reactor decommissioning. INES Level 4.

1980 Orleans, France Rupture of fuel bundles resulted in a release of nuclear materials. Rated level 4 on INES.

1981 Tsuruga, Japan Radioactive materials released into the Sea of Japan. More than 100 workers exposed to doses of up to 155 millirems per day of radiation during repairs. Level 2 on the INES.

1983 Buenos Aires, Argentina Accidental criticality resulting in fatal 2000 rad of gamma and 1700 rad of neutron radiation to one worker and up to 35 rad to 17 people outside the reactor. INES level 4.

1986 Hamm-Uentrop, Germany Reactor malfunction resulted in radioactive release detected two kilometers away.

1993 Tomsk, Russia Explosion at this plutonium reprocessing facility caused release of Pu 239 and other radionuclides 20 km beyond the facility property exposing the village of Georgievka and 160 on-site workers and 2,000 cleanup workers to doses of up to 50 mSv. INES level 4.

1999 Ishikawa Prefecture, Japan Uncontroled sustained reaction due to operator error. Reactor owner did not report this incident and falsified records, covering it up until 2007. INES level 2.

1999 Ibaraki Prefecture, Japan Accidental criticality due to operator error resulting in neutron exposure to 3 workers. Two died. 16 other workers received lesser doses of 1 mSv or greater. INES level 4.

2003 Paks, Hungary Rupture of fuel rods releasing radionuclides. INES level 3.

2005 Sellafield, England Twenty metric tons of uranium and 160 kilograms of plutonium disolved in 83,000 litres of nitric acid leaked over several months from a cracked pipe into a stainless steel sump chamber at this reprocessing plant. INES level 3.

2005 Braidwood, Illinois Tritium contamination of groundwater at Exelon reactor.
2006 Erwin, TN Thirty-five litres of highly enriched uranium solution leaked during transfer into a lab at Nuclear Furl Services Plant. INES level 2.

Fermi 1: On October 5, 1966, "when Fermi 1 over heated and released radiation into and out side of the containment building operators were uncertain of what to do. Fuel had melted. Fuel distribution had shifted which could threaten a secondary major explosion. This was already beyond designed parameters and predictions that it was impossible for this to happen. The reactor had not shut down automatically. It had to be shut down manually. Operators were in a quandary as to what to do next to stave off a larger catastrophe. They did not know the cause of the problem or how to fix it. The best nuclear experts from around the country and the world were called and consulted. In 1968, a year and a half after the meltdown, after tedious efforts to examine the core of the reactor, with the risk of a severe explosion at each step and the prospect of hundreds of thousands of deaths, the piece of zirconium metal that had blocked coolant was retrieved from the bottom of the reactor. It had broken off from its installation. Its presence did not appear on the blueprints of the reactor design. In May of 1970, Fermi 1 was allowed to resume operation when 200 pounds of radioactive sodium burst out of the pipes and was doused with water causing it to flash and burn. It was doused with argon gas. Fermi 1 was closed forever on August 27, 1972. The AEC (Atomic Energy Commission) was building a new breeder reactor at Oak Ridge, TN as though Fermi 1 had never existed." Fermi 1 sits radioactive and needing to be monitored indefinitely with no resolution possible. See We Almost Lost Detroit by John Fuller 1975 Readers Digest Press. Crowell Company New York.

Unsafe 23 GE Mark 1 and 8 GE Mark II Reactors
On March 21, 2013, Beyond Nuclear with 27 co-signers addressed a PETITION TO REVOKE THE OPERATING LICENSES AT GE MARK I & II BOILING WATER REACTORS IN VIOLATION OF LICENSED CONDITIONS FOR SAFE OPERATION AND RELIABLE CONTAINMENT to the Nuclear Regulatory Commission (NRC). It contained 25 petitioner concerns asserting that 23 GE Mark I and 8 GE Mark II reactors do not meet requirements for loss of offsite power, reactor cooling systems, and other events leading to nuclear fuel damage, overpressure and over-operating events challenging the containment system. Additional concerns specified were fuel pool risks, seismic risks, and unacceptable evacuation plans for accident situations.

Excerpts from the Petition:
"Whereas, all Mark I and Mark II reactor containment structures do not comply with NRC General Design Criteria 16 "Containment Design" which requires "an essentially leak tight containment against uncontrolled releases of radioactivity to the environment," as the result of a to-be anticipated accident involving reactor core fuel damage and the overpressure and over-temperature events of the Mark I and Mark II containment system.
Whereas, the NRC currently intends to mitigate by a severe accident capable containment vent the release of high pressure, high temperature, non- compressible gases including explosive hydrogen gas generated by an accident stemming from reactor core fuel damage and overheated zircoloy [zircalloy] fuel cladding interaction with water, the Commission is diversely divided by professional opinion and has by majority vote unduly and significantly delayed so as to effectively reject the timely implementation of the professional judgment of the agency's Japan Lessons Learned Project Directorate and Nuclear Reactor Regulation staff on the value to public health and safety to simultaneous vent radiation from fuel damage to the atmosphere without effective filtration by deliberately and principally defeating the conceptually flawed and structurally vulnerable Mk I and II containment system to preserve it from permanent failure;...."

The NRC response: "It was determined that the proposed order requiring engineered filters was not a matter of assuring adequate protection of the public, but instead addressed very low-probability, beyond-design-basis events."

More excerpts from the Petition:
"Whereas, the Petitioners raise an issue of the undue risk to public health and safety introduced by the lack of timeliness on the part of NRC and industry as evident by Order (EA 2012-050) which requires no action on an enhanced reliable vent (specifically excluding any service for enhancing containment reliability for post-fuel damage events) before December 31, 2016, SECY 2012- 0157 for containment upgrades with no requirement for action for Options 2 through 4 before December 31, 2017, and now the undue and indeterminate delay introduced by majority the Commission Notation Vote announced March 19, 2013, with no effective Orders with deadlines specified for reliably operable containment strategies and therefore extended non-compliance with the licensed agreements established under General Design Criteria 10 and General Design Criteria 16.

Therefore, the Petitioners call for the revocation of the operating licenses for boiling water reactors with the Mark I and Mark II containment systems.
The Commission is making decisions based on financial burden to licensees that overshadows public safety.
The evacuation plan, at Limerick Generating Station, will not work.
Various plants with GE Mark I & II BWRs cannot withstand potential flooding hazards."

The NRC Petition Review Board (PRB) issued a response on 3-26-14 rejecting the petition: The NRC stated: "The petition is rejected, because the concerns raised did not reveal that the licensees of the Mark I and II BWRs are in violation of their current licensing basis nor warrant that the licenses need to be revoked."
http://www.beyondnuclear.org/storage/kk-links/3%2027%2014%20ML13338A612-1.pdf

The nature of this petition was to specify failures of the GE Mark I demonstrated at Dai-ichi and to raise the human consequences and the long term impacts to the rest of the biosphere. To read this response by the Petition Review Board is to see that the NRC ignores the fact that we have the potential for a Level 7 (on a scale of 1 to 7) or greater nuclear disaster here. The NRC response is very telling in that, if it wants to say these reactors are in compliance with licensing requirements, then those requirements are meaningless for human survival. To assert, as the NRC does, that what happened at Dai-ichi can't happen here is provocative and terrifying. It lets us know that we are profoundly vulnerable not only due to nuclear reactors but also because the NRC and the nuclear industry stand in the way of our safety.

Withdrawn Nuclear Reactor Fuel Rods
"Spent" fuel is highly flammable as well as radioactive, yet is primarily stored in densely packed pools of water that contain several times more fuel than the nuclear reactor itself. If a fuel pool is damaged or loses its cooling system, fuel rods could be exposed, overheat, and catch fire, releasing massive quantities of radioactive material. NRC refuses to address the incredible risks these facilities pose, pretending the low likelihood of an accident makes the extreme consequences irrelevant. Hardened On-Site Storage systems (HOSS) should be used to store spent fuel more safely and securely at or near nuclear plants. HOSS reduces the immediate dangers spent fuel poses, without creating unnecessary risks. http://ieer.org/wp/wp-content/uploads/2010/03/HOSS_PRINCIPLES_3-23-10x.pdf

75% of the total (72,000 metric tons, plus 2,000 tons more per year) of spent fuel is in fuel pools and allowed to remain there for as much as 60 years beyond licensed life of reactor operations.

The Generic Environmental Impact Statement (GEIS) on Waste Confidence, NUREG 2157 http://pbadupws.nrc.gov/docs/ML1322/ML13224A106.pdf underestimates the risk of fuel pool fires and ignores the safer alternative of hardened on site storage at the nuclear plant sites. Dry cast storage at Dai-ichi survived the number 9 earth quake, tsunami, loss of the electrical grid, and loss of back up diesel generators much better than the reactors themselves and their fuel pools.

There is a consensus among the U.S. government and the nuclear industry for more than 60 years that withdrawn spent fuel rods are lethal in minutes unless shielded. To continue to produce them and intend to abandon them into the biosphere (deep underground dump) is profoundly immoral and a burden and a curse on future generations into eternity. It is premeditated murder.

There is no basis in science, engineering, the behavior of the nuclear industry and the Nuclear Regulatory Commission (NRC) for confidence that high level radioactive withdrawn fuel rods ("spent fuel") can or will be managed with no risk to the biosphere for as long as the radioactivity last . For the NRC and the nuclear industry to assert probabilistic assessments of what will happen to radioactive material over 240,000 (plutonium) to a billion years for some radionuclides, is a fraud and a con game. There is insufficient data for such probabilistic assessments to have validity. Apart from that, even a small likelihood of the risk of a serious untoward event involving spent fuel could be catastrophic for all life forms, air, water and land. Nuclear accidents cannot be undone.

NRC's Waste Confidence policy assumes that all nuclear spent fuel is the same. This is far from the truth. The industry is moving toward new fuel types, such as MOX (mixed oxide) and high-burnup fuels, which are more radioactive, dangerous, thermally hot and difficult to store and transport safely.

Fermi 2 has an over crowded fuel pool with 600 tons of spent fuel. It is the largest GE Mark 1 reactor. It is at risk for weather events, loss of coolant, or terrorist attack. Like Dai-ichi reactors and all 23 GE Mark 1 reactors in the U.S., it's cooling pool does not have back up cooling. It has no diesel generators for cooling pool water circulation to rely on in loss of electrical grid emergency. There are 1,331 highly radioactive irradiated spent nuclear fuel assemblies in Fukushima Dai-ichi Unit 4's storage pool. Fermi 2's high-level radioactive waste storage pool contained 2,898 irradiated nuclear fuel assemblies by spring 2010, according to U.S. Department of Energy projections documented in the Yucca Mountain Final Environmental Impact Statement (Feb. 2002, Table A-7, Proposed Action spent nuclear fuel inventory). Fermi 2 could generate another 443 irradiated nuclear fuel assemblies between spring 2010 and spring 2014, meaning by then, a total of 2,898 + 443 = 3,341 irradiated nuclear fuel assemblies. So, Fermi 2's storage pool would hold 2.5 times as much high-level radioactive withdrawn fuel rods than Fukushima Dai-ichi Unit 4's pool! A cooling pool fire at Fermi 2 would be worse than a meltdown of the Fermi 2 reactor itself in its release of a larger dose of radiation into the environment, resulting in widespread illness, deaths, and genetic mutations. If the radioactivity releases from either location (the reactor, or the irradiated nuclear fuel storage pool) are bad enough, the entire site might have to be evacuated. No intervention would then be possible. Not only could reactor meltdowns proceed out of control, but high-level radioactive spent fuel storage pool fires could result -- emitting orders of magnitude more hazardous radioactivity into the environment than even a reactor meltdown, as the pools are not contained within a radiological containment structure. Fermi 2 is lacking hundreds of structural welds on various floors of the reactor building, never put in place like they were supposed to have been some 40 years ago. This has meant that it could not safely withstand the weight of the crane and cask necessary to move the sufficiently cooled spent fuel to Hardened Onsite Storage (HOSS).

Conclusions

Nuclear Reactors came into being and exist because they were the route to nuclear weapons material. The two are joined at the hip, spawning each other. The U.S. will continue producing nuclear weapons material at the Watts Bar commercial nuclear reactor and downplays the release of thousands of curies of tritium into the Tennessee River. http://orepa.org/public-comment-period-on-nnsa-tritium-plan-open-now/ Commercial reactors and nuclear weapons depend on ***two lies successfully told*** for their shared vitality:

First, that nuclear weapons are useable. They combine homicide and suicide in one act.

Second, that nuclear reactors are safe, clean, and carbon free. They are profoundly dangerous. Their damage is permanent into eternity and an immoral burden on future generations. Their carbon foot print is visible beginning with uranium mining. The cost of nuclear power exceeds the value of the electricity produced. And that is without calculating the cost of monitoring the radioactive materials produced and shielding the biosphere through every generation into eternity. Without federal loan guarantees, outright gifts of taxpayer dollars, higher utility rates to pay for construction in progress, and indemnification provided to reactor owners by the Price-Anderson Act, amended in 2005, the nuclear power industry would not have come into being and continue to exist. The American nuclear industry has done great damage to the biosphere which we are a part of and on which we all depend. And we weren't asked for our permission, in the beginning or now. Reading the NRC response to the Petition to Revoke the Operating Licenses of GE Mark I and II reactors cited above, one sees that the Petition Review Board accurately states that the NRC is the creation of and supported by the U.S. Congress. That takes the problem back to the citizens of the country who are, understandably, uninformed, misinformed, lied to, systematically, but also the potential voice saying, "We're not having it!"

Vic Macks Gail Macks