1957: Fateful Year for the Nuclear Weapons Industry

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The year 1957 was a bad one for the nuclear industry. On September 29, 1957, a cataclysmic explosion occurred at the Chelyabinsk 40 complex (now called Mayak) near the small city of Khystym on the Siberian side of the Ural Mountains in Russia. Just eighteen days previous, on September 11, a disastrous fire erupted half-a-world away in the USA, at the Rocky Flats nuclear bomb factory near Denver, Colorado. Nine days following the Khystym blast, on October 8, a major fire broke out in a reactor at England's Windscale nuclear facility in Cumbria on the Irish Sea.

My presentation describes briefly what happened in each of these incidents. The conclusion refers to common elements and their implications for citizen action.

Rocky Flats Fire

The Rocky Flats plant is located about 25 kilometers upwind of the city of Denver. Today the Denver area population exceeds 1.5 million; in 1957 the population was about half this amount. Until production was halted at Rocky Flats in January 1992, the mission of the plant was to manufacture the fissile plutonium "pit" for every nuclear warhead in the US arsenal. A plutonium pit resembles the bomb that destroyed Nagasaki. In thermonuclear weapons the pit is a bomb within a bomb. When detonated, it creates the fission explosion that triggers the far more powerful fusion explosion of a hydrogen bomb.

Plutonium is exceedingly rare in nature. It is created in reactors like the one that burned at Windscale, or like those at Chelyabinsk 40 in Russia or at Hanford, Washington, in the USA. Plutonium-239, the main ingredient of a plutonium bomb, has a half-life of 24,110 years; it remains radioactive for more than a quarter of a million years. It emits alpha radiation that cannot penetrate the skin. But a tiny speck inhaled or ingested can do great

harm once inside the body. Negative effects in the form of cancer may not be manifest until 20 to 40 years after exposure. Specifying the exact source of a plutonium-induced sickness or death, therefore, is very difficult, unless the health of exposed individuals is closely monitored over decades.

The September 11, 1957, fire at Rocky Flats exposed an unknown number of people in and around Denver to plutonium. The fire erupted in a production area, then spread via the venting system to the flammable filters that supposedly protect the public. An explosion and fire destroyed most of the main bank of filters, sending a plutonium-laden cloud over the Denver area and beyond.

In the history of Rocky Flats, there have been three major accidents: the 1957 fire, a second fire in 1969, and windblown particles released from corroded radioactive waste drums stored outdoors from 1954 till 1968. Rocky Flats officials say that the third of these is the greatest source of offsite contamination from the plant. But in fact the 1957 fire may have been the largest single radiation release in the plant's history. The amount released is uncertain, since the smokestack monitors were destroyed in the fire. The filters had not been changed since the plant went into operation in 1953. Destruction of the filters alone may have released 10 to 225 kilograms of plutonium. An additional 14.3 kilograms of plutonium could not be accounted for after the fire.

At the time of the 1957 fire no warning was given to health agencies, schools, or local and regional government bodies. No steps were taken to protect the public. No warning was given to employees at the plant (workers in the industry lack access to their personal workplace health records). A local health officer, Dr. Carl Johnson of the Jefferson County Health Department, later studied the statistics of cancer incidence in the Denver area. He concluded that there was a marked increase in the incidence of cancer after the 1957 fire. Rocky Flats authorities tried to refute Johnson. This demonstrates the need for independent studies to show the effect of Rocky Flats on the health of nearby populations. To this day, such studies have not been performed.

On May 11, 1969, a second major fire occurred at Rocky Flats. Smoke billowing from the facility was observed by many people, including radiochemist Edward Martell. He and other scientists asked Rocky Flats officials to test the soil around Rocky Flats for radiation. When Rocky Flats officials refused, Martell and his associates took their own soil samples. They found unusually high deposits of plutonium east of the plant, toward central Denver.

In February 1970 Martell and his associates called a meeting with the Colorado Department of Health and Rocky Flats personnel to report their findings. At this meeting, Rocky Flats officials seemingly wanted to prove that the plutonium found by Martell did not come from the 1969 fire. Therefore, for the first time Rocky Flats personnel revealed two other main sources of offsite radiation, namely, the 1957 fire and windblown particles that had leaked into the soil in the drum storage area. This is how the public learned about the 1957 fire, twelve-and-a-half years after it happened.

Windscale Fire

Great Britain, reduced to the rank of a second-rank power after World War II, wanted its own nuclear bomb program. Two reactors to produce plutonium for bombs were built in Cumbria, just east of the Lake District, at Windscale near the coast of the Irish Sea (this facility is now called Sellafield). On October 8, 1957, a uranium fire erupted in the core of one of the Windscale reactors. For three days large quantities of iodine-131 and other radionuclides were released into the atmosphere, contaminating a 200-square-mile, mainly agricultural region inhabited by 80,000 people. Before the 1986 Chernobyl disaster, the Windscale accident was the most serious anywhere in a nuclear reactor.

Realizing that grazing lands over a wide region were badly contaminated, British authorities banned milk production in the area. They confiscated thousands of gallons of milk from dairy farms and later dumped the contaminated milk into the Irish Sea (the British have dumped radioactive waste into the Irish Sea ever since the Windscale reactors became operational in 1951). Because radioactive iodine settles in the thyroid gland, thyroids were removed from cattle slaughtered in the area.

When news of the Windscale fire first broke in the press, authorities reported that all radiation released had blown out to sea. Their own action banning milk sales forced them to change this story. Various people demanded an investigation of what had happened and why the public was not warned of danger. Eventually, an investigation was conducted, but it was not independent of the nuclear industry, and the findings were never made public.

Prime Minister Harold Macmillan himself explained that an independent inquiry could not occur because "all the people who are really expert in this area are, in one way or another, in the employ of the Atomic Energy Authority," the agency that operated Windscale. He dismissed demands that their report be made public with the remark: "It [the official report] is a technical document dealing with design and operation of a defense installation. It would not be in the national interest to publish the report." When an abridged version of the report finally was published in a showpiece press conference, all difficulties were glossed over. The media were shortly assuring the public that it had no worries regarding the Windscale accident.

Handling of the Windscale accident revealed a pattern used repeatedly by various governments faced with problems in the nuclear industry. Virtually all scientists trained in nuclear physics and related subjects are made economically dependent on the industry they might otherwise criticize. Then, when the need arises, these scientists who are bought and paid for by agencies harming the public get presented as objective, unbiased experts. Those like Ed Martell and Carl Johnson at Rocky Flats who dare to question the official line then get ridiculed as biased and unscientific. And citizens in general who cannot claim the mantel of scientific expertise get dismissed as ignorant and uninformed.

Chelyabinsk or Khystym Explosion

When the Soviets embarked upon their own nuclear bomb program, reactors and plutonium processing facilities were built in the Ural Mountains north of the city of Chelyabinsk near Khystym at an area called Chelyabinsk 40. The area around this facility is now

probably the most contaminated place on the planet. People of the area have been exposed cumulatively to more radiation than the much more studied, better-known victims of Chernobyl. The largest releases of radiation at Chelyabinsk all came from waste. Nuclear bombs cannot be made and nuclear energy cannot be generated without producing large amounts of radioactive waste, and no one has yet solved the problem of what to do with this waste.

One of several waste treatment methods at Chelyabinsk was to place the waste underground in large tanks. On September 29, 1957, one of these tanks erupted in a horrendous explosion, releasing 20 million curies (one-fourth the Chernobyl release). An area of several hundred square miles containing 217 towns and villages inhabited by 270,000 people was contaminated. A trail of radioactive debris extended eastward for 1,000 kilometers.

Within ten days 1,100 people were evacuated, within eighteen months another 10 to 20,000 more. Most of these people were resettled elsewhere and their belongings, animals, and the villages in which they had lived were burned and buried. More than 500 square miles of land was taken out of production and plowed under (80% of this land was restored to some use by 1978, mainly for cattle and pigs). By the fall of 1959 all the pine trees in a 20 square kilometer area perished.

No one really knows the health and environmental costs of the 1957 explosion at Chelyabinsk 40 (often referred to as the Khystym explosion). After the accident, Soviet scientists conducted numerous radioecological and health studies in the area. Published reports of this research, however, hid the nature of the disaster as well as its location (such reports became the basis of Zhores Medvedev's *Nuclear Disaster in the Urals* [1976]). Medical personnel in the region say that over the years they were aware of treating people with severe problems resulting from radiation exposure. But they were forbidden to mention radiation. The Soviet government officially acknowledged the 1957 explosion in July 1989, almost 22 years after the event.

Conclusion

Of the three 1957 accidents referred to above, the Windscale fire occurred in a plutonium-production reactor, the Rocky Flats blaze in a factory where bomb parts were made, and the Chelyabinsk explosion in a waste-storage tank. Together these incidents reveal early in the history of nuclear bomb production that the industry is unsafe at each of three distinct stages in the nuclear cycle: creating fissile material in a reactor, fabricating bomb parts, handling waste. These three areas remain problematic. Bomb-makers seem slow to learn the lessons of 1957.

There are crucial parallels between what happened in 1957 at Rocky Flats, Chelyabinsk and Windscale:

1. Each accident endangered the downwind human population and contaminated the nearby environment, affecting all life forms for generations to come.
2. Official secrecy ruled the day at each location.
3. In each case, official secrecy gave way to official deceit. Dangers associated with radiation releases were minimized and local people were told they had nothing to fear and that, not being experts, they should keep quiet.
4. In all three settings local populations were forced to live with consequences of decisions made not by themselves but by others.

What has just been said underscores a fundamental truth. The primary problem with the production of nuclear bombs is not contamination of the environment. Nor is it the threat of nuclear holocaust. The primary problem is the lack of democracy. Democracy means rule by the people. If the people ruled, would they poison themselves? If the people ruled, would they contaminate the air, soil and water?

Official secrecy of the sort present at Chelyabinsk, Rocky Flats, and Windscale is the enemy of democracy. For democracy relies on full access to information and free expression of all points of view. Nuclear bomb production, on the other hand, requires secrecy and centralized control. In order not to alarm a threatened public and to harness the energy of an endangered workforce, the truth about the dangers of the whole enterprise must remain secret. During the Cold War this secrecy was justified ideologically as necessary, on the one

side, for an anti-Communist crusade, on the other, for an anti-Imperialist one. But in reality governments were warring against their own people.

The challenge for all of us, in the US as well as in Britain and the former Soviet Union, is to strengthen democracy in the sense of self-rule so that the harm of nuclear bomb production will not be repeated. This means, at minimum, opening the record to the public so that the truth is fully known, and, second, providing for greater citizen participation in all decisions about closing and cleaning facilities where bombs have been produced.