The Chernobyl Disaster

“Moments in Time”
The Chernobyl Disaster

The settlement of Chernobyl was first officially recorded in 1193. And from that time on, it has become a town – and then a city – and has changed hands from the Grand Duchy of Lithuania, to Poland, on to the Russian Tsar, and then part of the Soviet Union, and is now – after the dissolution of the USSR – within the bounds of the Ukraine.

In its earlier years, the people of Chernobyl had jobs mainly in iron smelting, some agriculture, arts and crafts, and shipping on the Dnepr River. However, in the 70’s, a nuclear power plant was built 20 kilometres from the town, bordering the Pripyat River. The first reactor started operations in 1977; and by 1983, three more followed – with a total of 4 gigawatts, producing approximately 10 percent of the Ukraine’s electricity. It was one of the largest nuclear power plants in the USSR.

It wasn’t until April 26th, 1986, however, that Chernobyl became recognized, throughout the world…

> *“In the early morning hours of April 26, 1986, reactor No. 4 was operating at very low capacity (6 to 7 percent) during a planned shutdown. Plant personnel intended to monitor the performance of turbine generators, which supplied electric power for the plant’s own operation, during a changeover from standard to a backup source of power. The reactor’s design made it unstable at low power, and the operators were careless about safety precautions during the test. After a sudden power surge, two explosions destroyed the reactor core and blasted a large hole in the roof of the reactor building.*

> *Radioactive debris moved up through this hole to heights of 1 km (0.6 mi), carried by a strong updraft. Fires caused by the explosion and the heat of the reactor core fed the updraft" ('Chernobyl' Accident – MSN Encarta).*

Before the fires were under control, a massive amount of radioactive fallout had escaped into the atmosphere – more than 30 to 40 times more than the atomic bombs had created at Hiroshima and Nagasaki during WWll. Natural drifting, helped by winds, caused the radiation to move over the western Soviet Union; Eastern, Western, and Northern Europe; and eastern North America.

Unfortunately, it wasn't until 24+ hours, following the explosion, that the Russian government ordered the evacuation of Pripyat – telling its citizens that it was merely 'temporary', and concealing the actual severity of the situation.

Not until April 28th, however, when the high radiation levels set off alarms at the Forsmark Nuclear Power Plant in Sweden, did the Chernobyl disaster became known throughout the world. And even then, although the Soviet Union was forced to admit there had been an accident, its enormity was suppressed. Their veil of secrecy didn't last for long, however.

Clean up began immediately, and one of the first concerns was the possibility of a steam explosion in the 'bubbler pool', underneath the reactor. The basement area had been flooded by broken water pipes and fire water; and they feared that the molten radio-active 'soup' might melt through the floor – and into the bubbler pool – causing a blast. Consequently, the bubble pool needed to be emptied; and that required opening the sluice gates. Three men volunteered – and dressed in diving suits – went bravely into the dark, radioactive water. Fortunately, they managed to find and open the gates – but they never reappeared.

Another precautionary measure, to prevent a steam explosion, was the decision to freeze the earth below the reactor, and keep it at a temperature of -100°. And with the use of drilling equipment, crews began injecting about 25 tonnes of liquid nitrogen per day, while firemen pumped out the radioactive water in the basement.
In addition, the reactor was deluged with 5,000 metric tons of buffering material – lead, boron, sand, and clay – and, later, a second foundation was built beneath the reactor to prevent groundwater contamination. Meantime, all the radioactive debris was collected and deposited in the destroyed reactor.

What was left of the reactor, and the debris inside, was then covered by a temporary sarcophagus – built with steel and concrete – to prevent any of the radiation from escaping. However, due to natural forces, the sarcophagus is crumbling; and a second replacement shelter is due to be built by the end of 2011. According the World Nuclear Association, it will be an 18,000 tonne metal arch – 105 metres high, 200 metres long and spanning 257 metres – and will cover both reactor 4 and the 1986 sarcophagus. Meantime, the old sarcophagus has been stabilized, and it undergoes regular maintenance.

As for the remaining three reactors, they were temporarily put back into operation after the clean-up. Reactor 2 was again closed after a fire in 1991; reactor 1 was shut off in 1997; and finally, reactor 3 – and the power station itself – was officially closed down December 15, 2000.

In excess of 200,000 people were relocated due to the Chernobyl blast. And although there have been many illnesses since then, there are no definite figures, as to how many of these are a direct result of the radiation. Additional factors – such as poor nutrition, a poor general level of health, and stress – have made the numbers very difficult to establish. A rise in thyroid cancer seems to be the only exception:

"However, at least one type of cancer can be attributed

> *directly to Chernobyl. There has been a significant rise in the incidence of thyroid cancer among children in the areas where radiation levels are the highest. Thyroid cancer rates in Homyel' Oblast, for example, increased 22-fold from 1986 through 1990, compared to the period from 1981 through 1985". (MSN Encarta)*

As for the surrounding area, a 'Zone of Exclusion' was created in 1986 – and still remains to this day. This zone is the 30 km/19 mile exclusion zone around the site of the Chernobyl nuclear plant, itself. Residential, civil, or business activities in the zone are prohibited and punishable by law. Only those who actually work at the nuclear plant are exempt.

Mother Nature, however, is slowly starting to reclaim the zone. Many types of birds, wildflowers, plus small and large animals, have reappeared quite successfully – although scientists still disagree about the actual numbers and what the future will hold. Still other scientists believe that the abundance of flora and fauna living there, is due to the fact that humans aren't.

In conclusion, the Chernobyl nuclear explosion was very devastating, and I can only hope that something was learned from it. However, I have my doubts, as our own British government has given formal backing for private companies to build nuclear power stations, here in the UK.

Jody Anderson

References:
Discovery Channel, MSN Encarta, BBC.co.uk, Wikipedia, and The Independent.

Coming up in our next 'Moments in Time' (January issue), is a reminder of the
Love Canal

The Love Canal is a neighborhood in Niagara Falls, New York, (USA), which became infamous – and with much controversy – when it was discovered there was 21,000 tons of toxic waste buried beneath it.

(***there are two sets of falls, very close together. One is on the American, New York side of the border – while the other Niagara Falls, is on the Canadian side.)