The Decade of Despair

By DAVID R. MARPLES

After the explosion, Soviet authorities established an Exclusion Zone around the plant. Most residents left; some did not, and a few others returned. At 58, Nina Adamovna Franko, is a “young” resident of the zone.

The Chernobyl accident on April 26, 1986, was the world’s worst disaster at a civilian nuclear power plant. It is also one of the most widely known and controversial industrial disasters of all time. Wildly exaggerated claims have been made about the accident’s impact; equally wild assertions have been made in dismissing its effects. Objective assessments are few. The truth about Chernobyl has been bent from the start—the Soviet Union wanted to protect the reputation of its ambitious nuclear power program, and the nuclear industry everywhere wanted the public to believe that a similar disaster “could not happen here.”

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In the Soviet Union, “Chernobyl” became a battle cry for anti-Moscow protest, and for an assault on an industry with a poor record. (Ironically, its record was no poorer than that of other Soviet energy industries; both the coal and oil industries had suffered higher casualty rates, and the coal industry had caused terrible air pollution for years.)

Scientists have attempted definitive studies of the effects of Chernobyl, but they have invariably fallen short of the mark, mainly because of the lack of adequate or reliable data.

In August 1986, when the Soviet delegation to the International Atomic Energy Agency (IAEA) in Vienna reported its findings on the accident, there was a widespread tendency to praise the new openness of Mikhail Gorbachev’s presidency. The Soviets emphasized that the disaster was caused by “human error,” and a show trial was staged the following July in the contaminated town. The hapless plant director, absent at the time of the experiment that caused the accident, received a ten-year sentence. His colleagues got lesser penalties (two to five years). Repudiating this staged nonsense, Valery Legasov, the leader of the Soviet delegation to the IAEA, hanged himself nine months later, on the second anniversary of the accident. By all accounts, Legasov was plagued with guilt about the design faults and technical shortcomings of the Soviet-made reactor.

Ten years later, there is no consensus on the number of victims or the overall health impact of Chernobyl, nor has the accident engendered a new safety consciousness at the nuclear plants in the newly independent states. In the meantime, the Soviet Union has collapsed, replaced by 15 new republics, most of which are waging a battle for economic survival, with an inadequate supply of energy as a critical element in the struggle. Under these circumstances, the importance of nuclear power, even in Ukraine, the site of the Chernobyl station, has increased.

Still, after a decade, it should be possible to view the event without the emotions that have shaped many earlier discussions. In reviewing various aspects of the disaster, I will try to provide a reasoned discussion of the number of the accident’s direct casualties, its long-term health effects, and its meaning to an industry that relies on Soviet-made nuclear power reactors.

Direct casualties

One of the most controversial arguments about the accident concerns the number of direct casualties. The official Soviet toll rose from two to 31 during the summer of 1986, where it remained thereafter. Several West-

ern scientists have adhered to that number, and it is a staple of Chernobyl stories in the Western press. The “official” casualty report has developed into something of a truism—if something is repeated often enough, people begin to accept it.

But the figure of 31 direct fatalities at Chernobyl is as mythic today as it was in 1986. During the early cleanup phase, it was clear there would be many more victims, particularly among the crews decontaminating the plant, those flying helicopter sorties over the roof of the gaping reactor in a flawed attempt to stop radiation from leaking into the atmosphere, and those working at the reactor scene at a variety of other hazardous tasks.

By 1990, at least 5,000 decontamination workers had died, although not all their deaths can be attributed to Chernobyl.

For the most part, these people were not volunteers. They were military reservists, brought in from various parts of the Soviet Union. Most were in their 20s and 30s, but some were older. One of their missions was to fill in the great hole in the reactor roof—workers on the roof flung shovelfuls of radioactive graphite into the hole and, wearing heavy shielding, made their way as quickly as possible to safety. Radiation levels were so high that geiger counters, which were in inadequate supply, went off the scale.

Contrary to regulations, some of the workers remained in the “Exclusion Zone,” an area around the damaged reactor with a 30-kilometer radius, for six months or longer, accumulating potentially fatal doses of radiation. Many were cavalier about safety. When I traveled by car to the Chernobyl plant in the summer of 1989, I saw reservists sitting in ditches above which had been posted signs declaring, “Danger! Radiation!” Wearing only overalls, they were evidently taking a smoke break. A friend at the German magazine Stern showed me one of his prize photographs: it was of cleanup crews taking a lunch break at the site of the damaged reactor. They wore no protective headgear or clothing as they sat on the ground eating their sandwiches, with the roofless reactor looming behind them.

Any estimate of direct casualties involves supposition and guesswork. I have encountered totally undocumented estimates as high as 125,000. Even “official” sources are wildly inconsistent—how can one reconcile statements from Ukraine’s health ministry and the Chernobyl Union that thousands of union members have died—with an official report from Belarus that only 150 of the 66,000 decontamination workers from that republic have died? A decade after Unit 4 exploded, there is no consensus on the number of victims, nor are Soviet-style reactors any safer.
have died? In Belarus, the names of the workers are known and their records have been preserved.

Is it possible to make a reasonable estimate of the number of direct casualties of Chernobyl? The National Committee for Radiation Protection of the Ukrainian Population recently issued what appear to be far more reliable figures, indicating that 5,722 cleanup workers, or "liquidators" have died. To this total must be added approximately 100 plant personnel, Pripyat residents, local farmers, coal miners, and officials who died in the immediate aftermath of the disaster. This number may be low, because it is very difficult to obtain accurate information about those who were evacuated. Still, total deaths directly related to the Chernobyl accident must be in the region of 6,000. To say more is to enter the realm of the unknown. Nevertheless, I believe that 6,000 represents the minimum possible number.

**Fallout**

The Chernobyl reactor spewed highly radioactive fallout over a vast area, but only in the spring of 1989 was detailed information about fallout made available to the public. The accident contaminated an area of more than 100,000 square kilometers (about the size of the state of Kentucky), and lower levels of contamination affected many parts of Europe, particularly eastern Poland, southern Germany, and Scandinavia. The worst hit regions were in the then-Soviet republics of Belarus, Ukraine, and Russia.

Of the radionuclides released, the most harmful were iodine 131, cesium 137, and strontium 90. Because the latter two have much longer half-lives than iodine, they received most of the initial attention. The iodine, however, appears to have traveled the farthest and to have had the most severe repercussions in terms of health.

Scientists disagree about the effects of low-level radiation on humans. In Ukraine, claims made by scientists affiliated with the newly established Center for Radiation Medicine (administered at first by the Academy of Medical Sciences in Moscow) varied widely from statements made by environmentalists, political figures, doctors, local scientists, and journalists. While visiting Chernobyl and Kiev in 1989, I was told by specialists at the center that none of the thyroid problems of Ukrainian children were a result of the release of radioactive iodine. They attributed all sicknesses to "radiophobia" or to sensational journalism. On the other hand, the film Mi-kro-fon!, co-produced by journalist V. Kolinko, claimed that birth defects found in livestock 300 miles away were caused by fallout. Both sides seem to have indulged in gross distortion.

A similar debate arose over the amount of radiation the human body could tolerate. On one occasion, a prominent Ukrainian politician remarked that one week after the accident radiation levels in the city of Kiev were 100 times above the maximum permissible. What he probably meant to say was that levels were 100 times above natural, or background, radiation. After the accident—and with the approval of international authorities—the Soviet medical authorities declared that the population could tolerate a level of 35 rem above background over a natural life span of 70 years. This decision was immediately attacked by Ukraine's Green World environmentalists because it ignored the amount of radiation that evacuees and cleanup crews had already received. In 1991, the level was lowered from 35 to 7 rem, or 0.1 rem (1 millisievert) per year. (The background level in Ukraine is considerably lower than in Finland, which is generally about 6 millisieverts per year.)

The area hit hardest is a zone that embraces about 20 percent of Belarusian territory, from the Brest region in the southwest, to the Mogilev and Gomel regions in the east and southeast; a large portion of north-central Ukraine, including the Kiev, Zhitomir, and Chernigov regions; and in southern Russia, the Bryansk and adjoining areas. Cesium contamination is widespread. An estimated four million people live in areas where the soil is contaminated with more than 1 curie per square kilometer, which could result in additional radiation to the human body of 1 mil-
lisievert per year. Approximately 60 percent of this territory is in Belarus, 30 percent in Ukraine, and 10 percent in Russia. Because the region is predominantly agricultural, most families continue to rely on the food they produce on their private plots. Most of the local population has been consuming contaminated food for nearly a decade.

I visited the Chaussy district in Belarus in spring 1995. This region, which is 250 miles north of Chernobyl, has not received much public attention. Radiation levels range from 1 to 15 curies per square kilometer. Contaminated wells have been boarded up and local factories have closed down. The local economy is depressed and the local stores stock little food. Families must provide for themselves. In one house, an elderly man was even raising pigs in his kitchen.

Is the health of the local population at risk? The opinion of the villagers was mixed, but most were fatalistic. Children from local villages were being sent by a Minsk charitable organization to Europe and North America for summer vacations, in the hope that it might improve their generally poor health.

Evacuation is a controversial and much debated affair. About 116,000 people were evacuated immediately after the accident, all from the Exclusion Zone. In addition, both the Soviet and post-Soviet authorities have had a policy of immediately evacuating residents in other areas with cesium contamination of 15 or more curies per square kilometer.

Less urgent evacuation is based on 5–15 curies, and those living in areas with 1–5 curies—especially families with children—are considered eligible for evacuation if it should become impossible to obtain uncontaminated supplies of food and water. A much wider area than the original 30-kilometer zone was evacuated in 1989. There was a great clamor for evacuation between 1986 and 1990, but this sentiment has been less in evidence since then.

The declining interest in evacuation may be a reflection of the plight of evacuees in their new surroundings. The Belarusian press is filled with evacuee complaints—they are often unable to find employment and their new housing is shoddy, often lacking hot water (or just water). Sewerage is often inadequate. Many would-be evacuees prefer to wait in the zone, hoping to be moved to Kiev or Minsk. In some cases, though, the authorities have simply failed to act: A recent Ukrainian report noted that 2,000 families had been waiting to be evacuated from the Poliske district, just west of Chernobyl, for more than five years.

One family moved from the contaminated zone in Belarus to a “clean” area in Ukraine. At their new destination they were shunned by their neighbors, who feared the newcomers would contaminate them. Their children were ostracized at school for the same reason. The situation became so intolerable that the family decided to return to Belarus.

In Minsk, a group of newly constructed apartment blocks at the far north of the city is occupied almost exclusively by evacuees, who sit outside the apartments in rural style, conversing, smoking, and drinking. It has been difficult for the evacuees to adjust suddenly to

The sarcophagus—shown here as it neared completion—was finished by late 1986. Today it is not expected to last more than another decade.
their new environment. As one reporter said, "There is a lot of drinking there," and people are nostalgic for their native villages.

Many elderly people chose to remain in the zone. A 1991 study commissioned by the IAEA notes the strains caused by evacuation, but my visits to the zone suggest that staying behind is also a strain—few of those who remained receive an adequate or nutritious food supply.

Both Ukraine and Belarus have had to make deep cuts in spending for post-Chernobyl problems. Before 1994, Chernobyl-related expenditures—mainly for evacuating and providing housing and amenities for the resettled—swallowed 13 percent of the Ukrainian government's budget. Severe cost-cutting began in 1994 and 1995, and funding was cut to 3.4 percent. The chairman of the parliamentary committee that deals with Chernobyl-related problems states that this amount is totally inadequate. In Belarus, funding has been cut from a high of more than 20 percent of the budget to about 10 percent. Neither republic can afford to provide adequate funding on a long-term basis.

Both Ukraine and Belarus have depended on international aid, and on charitable assistance in particular. In Minsk Hospital No. 3, I saw testing equipment for diabetes and other items that had been sent from Germany to the Belarusian Charitable Fund's "For the Children of Chernobyl." At one time, 38 charitable organizations were devoted to assisting children in Belarus who were affected by Chernobyl. But it would be a mistake to think that these organizations are generously supported. Most are struggling for survival. As time passes, it becomes more difficult to raise funds.

Long-term health consequences

Few questions have been debated more heatedly than the effect of Chernobyl on the long-term health of the population. At one end of the spectrum is Anatoli Romanenko, the Ukrainian health minister, who announced in June 1986: "Medical services are keeping a close eye on health protection of everyone involved in relief work at Chernobyl.... The main thing is to preserve people's health. There is no cause for alarm whatsoever in the rest of Ukraine's territory [outside the 30-kilometer zone]. ... Doctors have checked tens of thousands of people, and thousands of tests have been carried out in the laboratories. Their results give us grounds to say that there is no danger to people's health."

At the other end of the spectrum is the current Ukrainian health ministry, which issues statements that require careful analysis. One communiqué noted that the health of those in the contaminated zones was deteriorating. By 1991, only 28–32 percent of adults and 27–31 percent of children were said to be in good health. Such astonishing figures reflect mainly heightened rates of respiratory diseases and diseases of the blood and nervous system.

These conflicting statements show how variable a single institution has been throughout the course of the disaster. The later claim—surely exaggerated—is the antithesis of the
attempt to cover up in the first months after the accident.

Health information was classified during the Soviet period, and apart from a single and nearly unreadable volume issued by the Soviet Academy of Medical Sciences in 1989, little was forthcoming other than the proceedings of scientific conferences. Before Chernobyl, little research was conducted on the kinds of problems a Chernobyl-type accident would produce.

In 1992, the Institute of Psychology of the Russian Academy of Sciences produced a major psychological study, noting that the field was new and little researched. Dr. A. Guskova of the Russian Institute of Biophysics observed: "The psychological damage is clearly the most important. . . . [T]he conviction that danger exists or does not exist, but rather to an uncertainty, a lack of constructive plans for the future."^ During a tour of hospitals and clinics in Minsk in December 1992, I was told that, before Chernobyl, diseases of the blood received little attention in the medical community in Belarus. A study of the incidence of leukemia was undertaken after Chernobyl, but a dispute was evident between the director of the Institute of Hematology and several of his leading researchers over the validity of reports of pre-Chernobyl rates. Today's numbers might be reliable, but statistics from the 1970s were probably the result of guesswork. Some researchers are now using European incidence as a baseline.

We do know that in general health and health care is problematic in both Belarus and Ukraine, and that in recent years, health statistics have taken an alarming turn. (In part, that may reflect a notable improvement in disease detection.) The infant mortality rate is more than double that for Europe as a whole, and cases of infectious diseases have risen markedly over the past four years. Both Ukraine and Belarus have experienced negative population growth in recent years. Diseases like tuberculosis and diphtheria, once thought to be under control, are back; vaccination rates have dropped. In southern Ukraine, 400 cases of cholera occurred last summer as a result of polluted water.

U.S. bone marrow specialist Robert Gale, speaking at the Eurochernobyl-2 conference in Kiev in 1991, remarked that although Kiev's hospital beds were full, he doubted that the occupancy rate was specifically related to Chernobyl. More recently, the deputy chief of Minsk's Children's Hospital No. 3 told me that there has been a dramatic increase in congenital diabetes. "Before Chernobyl," he added, "we had no such problems." By 1995, according to the Belarusian State Information Agency, the lung cancer rate among the 32,000 evacuees was four times the average of the rest of the capital's population.10

These reports present the observer with a predicament: Which current health problems are related specifically to fallout? There is no known or previously suggested link between congenital diabetes and radiation or the consumption of irradiated products. Yet the largest number of cases of childhood diabetes emanate from Gomel province, the most heavily contaminated region.

As a group, the cleanup crews, or liquidators, have clearly been affected the most. They suffer from a variety of diseases, particularly skin ailments. But not all liquidators have been monitored on a regular basis, and information from official Ukrainian sources is unreliable. Even the number of those who took part in cleanup is uncertain, with reports varying from 600,000 to 660,000. But the number seeking aid from the government has declined.

One reads indifferent and even callous statements denying that the accident has caused major health problems, even as more deaths are reported.11 But exaggerated statements from ostensibly responsible bodies like the Ukrainian Health Ministry mean that reality is often overlooked, especially in the skeptical international community.

Not all liquidators have been monitored on a regular basis, and information from official Ukrainian sources is unreliable.
In 1991, some reliable data were provided by V. G. Baryakhtar, the vice president of the Ukrainian Academy of Sciences. He reported that about 129,000 cleanup workers were living in Ukraine, but precise data were available for only 56,000 who had received radiation doses of 100–200 millisieverts. This number excluded 187 local residents who suffered from acute radiation sickness, and another 1,000 who had radiation burns as a result of the accident. About 80 percent of those examined had an impaired immune response. The rate of thrombosis was increased in cleanup crews, and about one-third of this group had experienced a loss of libido. About 40 percent of those studied had marked hearing impairments. Medical authorities in Minsk also report that people in areas where the radiation dose is estimated at 10–30 rem have an impaired immune response. Significant chromosomal aberrations are found in the population in all affected areas.¹⁰

Has Chernobyl had adverse genetic consequences for the human population? Of the three republics most affected, only Belarus has a program that monitors the incidence of congenital deformities. Using the period 1982 to 1985 as a baseline, the overall rate of congenital defects rose 24 percent from 1987 to 1992; in areas where the cesium contamination of the soil was 1–5 curies per square kilometer, the increase was 30 percent; and in areas with more than 15 curies per square kilometer, the increase was 83 percent. On February 1, 1991, the Belarusian parliament established the “National Preventive Program of Genetic Consequences of the Chernobyl Accident.”¹¹ Unfortunately, this study, like many others, has been plagued by a shortage of funds.

After the atomic bomb was dropped on Hiroshima in 1945, the rate of leukemia increased within 18 months, and the number of cases peaked within four to five years. Given the Japanese experience, it was anticipated that an increase in the rate of leukemia would be a major consequence of the Chernobyl accident.

Although it may take as long as 15 years after exposure to develop the disorder, there has not been a significant increase in leukemia in the Chernobyl-affected areas so far. Levels have risen somewhat in Ukraine and Belarus generally, and the leukemia rate is at the upper end of the European average. But the rate of leukemia seems to be lower than it was in the 1970s. In Minsk, which has the highest incidence of leukemia, there were 48 cases per million children from 1986 to 1991, compared to the reported 72.5 cases per million in 1979.¹²

Evgeni Ivanov, the chief hematologist in Belarus, asserts that the main cause of leukemia in that republic is industrial pollution, not radiation from the Chernobyl accident. His position is disputed by some of his own colleagues, who argue that it is not backed by scientific data; they add that Novopolotsk and Svetlagorsk, for example, are more heavily polluted than Minsk but have a lower incidence of leukemia.¹³ It may be premature to say that the Chernobyl accident has not resulted in increased cases of leukemia, but one can say that original predictions have not materialized.

In contrast, the rate of thyroid cancers in children has increased dramatically, and the increases appear to correlate closely with the areas that received the most radioactive fallout. These cancers may be attributed to the radioactive iodine in the atmosphere in the first days after the accident, or to the consumption of contaminated milk, which affects infants far more than adults.

One 1993 Ukrainian study predicted that, of the 89,000 people exposed to radioactive iodine in Pripyat and other heavily contaminated regions, there would be a maximum of 530 cases of thyroid cancer in children, of which 50 would be incurable; and 290 cases in adults, of which 30 would be incurable.¹⁴ In a letter to the author, John Jagger, a retired U.S. radiation expert, predicted that from 1989 to 2000 the number of cases of childhood thyroid cancers would be double the number recorded between 1989 and 1994, and would decline thereafter, with the rate of incidence following a bell-shaped curve. According to Jagger, a total of 932 cases could be expected.¹⁵ There is no evidence, however, that the disease has reached its peak, or that its appearance in the population follows Jagger’s model or the mathematical model adopted by the Ukrainian scientific team.
According to an October 1994 article in *Nature*, 527 cases of thyroid cancer had appeared in children in Belarus, Ukraine, and Russia; more than 65 percent were in Belarus. At a November 1995 meeting of radiation scientists sponsored by the World Health Organization, these cases were directly attributed to fallout from Chernobyl. One expert who has written widely on the subject, Dillwyn Williams of Cambridge University's Addenbrooke's Hospital, stated that in heavily contaminated regions one in every 10 children could conceivably develop thyroid cancer. Some cases have occurred as far as 300 miles away from Chernobyl.\(^{26}\)

Evgeni Demidchik, head of the Minsk Thyroid Tumor Clinic, has monitored the incidence of the disease in Belarusian children since 1966. Before the Chernobyl disaster, he saw an average of one case per year. “Excess” cases began to appear in 1990, and from 1993 to 1995, the number of new cases rose from 79 to 91 per year. By 1994, Belarus alone had reported that 424 children had thyroid cancer. Contrary to expectations, the number of cases has continued to rise each year.

Somewhat more than half of all cases came from the heavily contaminated Gomel province, and another 23 percent were reported in eastern areas of Brest province, near Pinsk; 11 percent occurred in Minsk. According to Demidehik, only seven cases have been reported in northern Vitebsk province, the only region of Belarus not affected by fallout.

Almost all of the afflicted children were born or conceived before the Chernobyl accident.\(^{19}\) Because of the close correlation of cases with the pattern of fallout and the ingestion of radioactive iodine, it seems probable that, of the 91 cases of thyroid cancer in Belarusian children in 1994, some 90 percent were radiation-induced.

Belarus also reports an increase in the rate of non-cancerous tumors in children. Before the Chernobyl accident, the average rate was one a year; now the annual rate exceeds 60.\(^{29}\) The increased incidence of both benign and cancerous tumors is a discernible and disturbing consequence of the Chernobyl accident. It is reasonable to conclude that Ukraine and Belarus had serious pre-existing health problems and that those problems have been exacerbated by the Chernobyl accident.

**Nuclear power**

The disaster at Chernobyl caused many countries, and most particularly the Soviet Union, to review the status of their nuclear power plants. On the surface, the newly independent republics have made notable improvements, and information about the operation of the nuclear power industry is more available. The IAEA visits the most potentially problematic plants. International attention has focused on other Chernobyl-type reactors, graphite-moderated RBMKs. RBMK plants include the reactors at Sosnovi Bor (St. Petersburg), Kursk, and Smolensk, in Russia; and the Ignalina plant in Lithuania.\(^{23}\)

The Chernobyl reactor that was destroyed was a second-generation RBMK-1000. Although little could be done to improve the other reactors on the site—to eliminate their instability if operated at low power or to fortify their inadequate containment—some improvements were implemented: Shutdown time was reduced; uranium enrichment was increased; and strict rules were introduced regarding the disabling of safety mechanisms and the conduct of experiments.

Nonetheless, the state of the nuclear power industry in the newly independent states is a cause for concern, if not alarm. Several first-generation units are considered obsolete and unsafe. An Armenian reactor, now re-started, is located in an earthquake-prone area. In addition, there are concerns about technical aspects of later generations of reactors. And despite its problems, Russia has announced an ambitious reactor-building program that would expand its nuclear power industry greatly.

Cost overruns and financial shortages have also contributed to problems in the nuclear in-
dustry. In 1994, it was reported at an international conference in Monterey, California, that safety regulators in Ukraine were not being paid on a regular basis, and that nuclear industry personnel were generally dissatisfied.™

Overriding this disturbing picture is the protracted debate between the G7 industrial nations and Ukraine over setting a date for the closure of the Chernobyl station and the construction of a new iron and concrete shell to cover the now-decaying sarcophagus in which Chernobyl’s Unit 4 is encased.

The Chernobyl station’s future

The Ukrainian government maintains that international concern about safety at Chernobyl is unwarranted; that the complex is safer than other RBMKs, and safer than plants with the other major Soviet reactor type, the VVER (water-water-pressurized reactor). Ukraine’s VVERs have a poor safety record; incidents occur regularly at the giant station near Zaporozhe.™

Ukraine and the G7 countries finally agreed in December 1995 to set the target date for the shutdown of Chernobyl as the year 2000.™ Ukraine was basically forced to accept this agreement by the G7’s threat to withhold future credits. Ukraine was also formally accepted into the Council of Europe in November 1995 and it did not wish to endanger this hard-won status. In exchange for the shutdown, Ukraine will receive $500 million in grants and $1.8 billion in loans—just over half of what the government estimates is needed.

Left hanging is the funding needed to place a new shell, sometimes called the Sarkofag-2, over the sarcophagus in which Unit 4 was encased in December 1986. The first sarcophagus was visibly deteriorating by the late 1980s, and it is not expected to last more than another decade. It cannot be repaired from inside because of dangerously high radiation levels—10,000 roentgens per hour, according to one source.™ After the new cover is in place—a yet-unfunded project that would cost upwards of a billion dollars—technicians could conceivably begin to disassemble the fragmenting first cover. Because Chernobyl Unit 3 will have to be shut down during construction of the new sarcophagus, Ukrainian authorities would like to delay the process as long as possible.™

G7 loans will be used to help Slavutich, a new town of about 28,000 that was built about 45 miles east of the Chernobyl station to house plant employees and their families, and to purchase a new source of energy to compensate for the loss of Chernobyl. Within Ukraine, there is a debate about whether it would be better to build a gas- or a coal-fired plant, or to commission two new reactor units at Rovno and Khmelnitsky.™

The Slavutich region is constantly monitored because the soil was contaminated by Chernobyl’s fallout. The choice of coal would simply compound the area’s environmental problems. On the other hand, neither Rovno nor Khmelnitsky has a particularly good safety record.

Greenpeace has proposed an alternative solution that would involve a stringent program of conservation. Primarily by reducing the activities of its machine-building and metallurgical industries, Ukraine might be able to reduce its energy use by as much as 65 percent.™ This plan would be unpopular because it would increase unemployment. However, the Greenpeace suggestion was highlighted in the parliamentary newspaper, suggesting that it is being taken seriously.

Statements from the Ukrainian nuclear industry and the Chernobyl plant suggest that the lessons of Chernobyl have been forgotten in some quarters. Sergei Parashin, the plant director, has frequently said that Chernobyl is much safer than other RBMK stations. His remarks were echoed in late November by Chernobyl press officer Valeri Idelson, who declared that the station was “the safest nuclear plant in Ukraine and one of the best among the [former Soviet] countries.”™ The Chernobyl plant sponsored the publication of a book claiming that the station could operate effectively and safely far into the future.™

After the accident, this statue of Prometheus—the giver of fire—was moved to the Chernobyl plant.
Facing the future

Daunting problems await. The roof over the destroyed reactor is cracked and its longevity is doubted. The situation has been aptly described by a Ukrainian expert who stated that virtually all the problems engendered by Chernobyl still remain, including the destroyed reactor and over 100 radioactive burial sites nearby. In spite of their financial and safety problems, both Ukraine and Russia have decided to continue to commission new nuclear power plants. Ukraine cannot afford to finance a new sarcophagus, and the aid the G7 group has proposed will cover only a small part of the expense.

In retrospect, the one major international study of the health consequences of the accident, the International Chernobyl Project, was inaccurate. Its conclusions have been contradicted as better information became available about thyroid cancer, casualties among liquidators, the incidence of congenital defects, and the general rise in morbidity that is sometimes termed “Chernobyl AIDS.” Few long-term safety lessons appear to have been learned. If anything, the chance of a major nuclear accident in the region is greater today than in 1986.

Several recent nuclear incidents could, potentially, have been serious, and one resulted in the loss of life. Of most immediate concern is the giant nuclear edifice on the Dnieper River at Enerhodar, near the industrial city of Zaporozhe, where there were two incidents in the first week of December 1995. Ironically, every accident there or at another VVER station bolsters the case for keeping Chernobyl open, on the theory that since 1986 it has been relatively accident-free.

Meanwhile, the Ukrainian nuclear industry has lost a number of specialists to Russia, where wages are higher and economic conditions are somewhat better. Over 8,000 nuclear workers left Ukraine between 1993 and 1995 alone, and the economic crisis has meant that many employees in the industry have worked for extensive periods without receiving wages. Small wonder that nuclear workers are described as “demoralized.”

Ukraine’s situation is not unique. The collapse of the Soviet Union created an energy-rich Russia and Turkmenistan, and energy-hungry countries everywhere else. With an urgent need for energy, the basic rules of safety have been pushed into the background. On one occasion I heard a Ukrainian nuclear official being lectured by a U.S. specialist about this sorry state of affairs. The response was angry, and can be paraphrased as follows: “It’s all very well for you energy-rich capitalists to sit in your armchairs and lecture our people, who shiver in frozen apartments. But if you were in our position, what would you do?”

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11. For example, see the account of a visit to the Chernobyl zone by Sir Bernard Ingham (Margaret Thatcher’s press secretary) in Nuclear Forum, Autumn 1994, pp. 4–9.
12. The ICP, pp. 41–44; interview with Evgeni Konoptya, Director, Institute of Radiobiology, Belarusian Academy of Sciences, Minsk, April 1995.
15. Ibid.
16. I. A. Likhtarev et al., “Ukrainian Thyroid Doses After the Chernobyl Accident,” Health Physics, vol. 64, no. 6 (June 1993): p. 598.
17. John Jagger, letters to author, Jan. 4 and 11, 1996.
21. The U.S. Energy Department lists Ignalina as one of the ten most dangerous nuclear power plants in the world.
22. Nikolay Steinberg, former chief engineer at Chernobyl and chief of safety operations for Ukrainian nuclear power stations.
25. Mikhail Umanets (former Chernobyl plant director and until recently chairman of the State Committee for the Use of Nuclear Energy), cited in Holos Ukrainy, April 1, 1995, p. 5.
30. Ibid.
31. The ICP, p. 62.