

INSIDE THE Beast

Text and photos by SERGEI KISELYOV

Translation by VIKTORIA TRIPOLSKAYA-MITLYNG

As I write this in Kiev in March, I can imagine what life will be like on April 26, 1996. The streets of Ukrainian cities will be decorated with flags of mourning to commemorate the tenth anniversary of the accident at the Chernobyl Nuclear Power Station. On this day, Ukrainians will drink vodka without clinking their glasses together. They will remember once again the day that split their lives in two: They now measure time "before Chernobyl" and "after Chernobyl," in the same way an older generation measures life "before the war" and "after the war."

After the fourth or fifth drink, they will start to recall the dreadful jokes of that Chernobyl summer, ten years past:

Question: How do you take an X-ray of a Moscovite? Answer: Put him between two Kievites.

Question: How can a Ukrainian protect himself from radioactive food? Answer: By using a dosimeter instead of a spoon.

Then there was Ukraine's new slogan: "A peaceful atom for every house!" And a new state emblem: a two-headed Ukrainian.

It will all be so hilarious, they will die of laughter.

But few will bother to recall that the Chernobyl Nuclear Power Station, which is destined to be linked throughout history with the



names of Pompeii, Hiroshima, and Nagasaki, bore the name of Lenin, who was the "Leader of the World Proletariat." And few will remember that the edge of the roof of Unit 4 was decorated with the slogan, "The Chernobyl Atomic Power Station, Bearing the Name of V. I. Lenin, Labors for Communism!"

It is still so much easier to immortalize the names of those who perished than to provide for the living. There are liquidation workers who literally saved the world from the Chernobyl disaster at the cost of their own lives, inhabitants of the Chernobyl zone, and children who in the past 10 years have been exposed to monstrous levels of radiation. Unfortunately, the government remembers them only on anniversaries.

Most of the men I interviewed have been silent for 10 years—not because they were scared to talk about what happened at the Chernobyl power station at 1:24 a.m. on April 26, 1986, but because no one wanted to listen. And, to be honest, they have been more concerned with how to survive and how to provide for their families in these complicated times.

I interviewed many of them in their apartments. I was struck by the fact that their homes were all decorated "Chernobyl style," that is, in a somewhat provincial fashion. More striking still was the fact those who suffered the most from the explosion at the nuclear power station were convinced that it should

**Six
who were
there
tell their
stories.**

Sergei Kiselyov, the Kiev-based Ukrainian correspondent for Literaturnaya Gazeta, was a Bulletin visiting fellow.

not be shut down.

I asked them all the same questions: What happened on the night of April 26? What has your life been like since the accident? How is your state of health today, and that of your family? What have you been doing on the night of the anniversary for the past nine years? And so on. The recorded answers of these men are unique testaments, and I have edited them as little as possible.

Sergei Kiselyov

* * * *

Yuri Korneev was assigned to work at Chernobyl immediately after graduating from technical school in 1976. A turbine operator at Unit 4, he was on duty the night of the experiment that caused the accident. (The experiment was designed to simulate an emergency in which outside power was cut. Could the inertial energy from a running-down turbine continue to power the water-circulation pumps until the diesel generators took over?) Today, Korneev is 39, married, and has two sons. He believes he was exposed to 710 roentgens.



Yuri Korneev

The responsibilities of a turbine operator include making sure the turbine and auxiliary mechanisms are functioning properly.

On April 26, precisely at midnight, I started my shift. I knew that an experiment was planned for this night at Unit 4. The seventh turbine was already taken off line, and the eighth turbine, which I operated, was next in line for shutdown and routine maintenance work. The inertial energy experiment was supposed to be conducted on this turbine. Many turbine engineers, the chief engineer, and the shop superintendent stayed for the night shift to supervise the experiment.

An hour after I started my shift, the Unit 4 dispatcher informed me that the experiment was starting. I went to the control panel, as I had to perform all the steps necessary for the shutdown of the turbine.

Usually I went through a procedure without any problems. But this time something went wrong. At the moment when the turbine stopped working, there was a sudden explosion in the area of the tubing corridor. I saw it with my own eyes, heard it with my own ears. I saw pieces of the reinforced concrete wall begin to crumble, and the reinforced concrete roof of our Turbine 7 began to fall.

In a few seconds the diesel apparatus kicked in, and emergency lights went on. I immediately looked at the roof of the turbine room. It was crumbling in layers. Falling pieces of concrete were slowly coming closer to my turbine.

It was all so unexpected. It was difficult to figure out what was happening. The explosion

and crumbling of the roof took only a minute, maybe even less. Right after that, a shift supervisor, Boris Rogozhin, and the [now] deceased deputy chief engineer ran into the turbine room from the control center. I was ordered to take care of Turbine 8 and not to pay attention to anything else.

I will not go into technical details. Let me just say that I got lucky when, as a result of the explosion, the ceiling slabs fell from the reactor on the top of the seventh turbine room, which was turned off, and not on my Turbine 8. I was also lucky when, a few minutes after the explosion, a multi-ton lead plug that closed a reactor channel fell within a meter of where I stood.

I was completely in the dark. The senior engineer of turbine management knew nothing. The shift supervisor knew nothing. No one knew anything, and no one knew what had just happened. In the turbine room there was equipment that was supposed to start working when the radiation level increased. However, the level of radiation was so high that this equipment failed immediately.

While I was busy with the turbine, an electrician, Baranov—who later died in the hospital in Moscow—ran in and started pumping out the hydrogen that cooled the turbine generator. His actions prevented another explosion.

After everything was done, an eerie silence fell on the turbine room. There was a small balcony; Baranov and I went out for a smoke. Underneath us on the street we saw pieces of Unit 4 and chunks of graphite thrown there by the explosion. Only later we realized what the radiation level was like on that balcony and how many extra roentgens we were exposed to during our smoke.

About two hours after the explosion I started to feel really sick. I had an acute burning sensation in my eyes, and they began to water. I was taken to the emergency room, along with Yura Vershinin, the inspector on duty, who later died in the Moscow hospital.

On April 27, a bus whose seats and walls were covered with plastic took us to the airport. A special flight brought us to Moscow, and the same type of bus picked us up at the Moscow airport.

I was in the hospital until July 14. I didn't have to have a bone marrow transplant, although there were willing donors. I was lucky; my body took care of itself. My diagnosis was radiation illness of the third degree. The highest level of radiation illness is the fourth.

Our locksmith on duty that night, Andrej Tarmazin, is the only man alive diagnosed with the fourth degree of radiation illness. His exposure was 860 roentgens; mine was only 710.

Incidentally, I didn't know this number

after the accident; it was concealed from us. I only found out three or four years ago. The Chernobyl firemen who died in Moscow and were buried at the Mitinsk cemetery were exposed to over 2,000 roentgens.

I don't know how and why I survived. The doctors don't know either. In their reports they write that I do not have health complaints. They are right; I don't have any. The only thing is, I have two artificial lenses in my eyes, and I often suffer from bronchitis. My sons and my wife, on the other hand, are not feeling that well. My younger son has stomach problems, the older one, heart trouble.

I haven't worked anywhere after Chernobyl. Those who were at the station on the night of the accident get a lot of help from the current management of the Chernobyl power station. They have given us the extra money the government cheated us out of for the past

"I looked at the roof of the turbine room. It was crumbling in layers. Falling concrete was slowly coming closer to my turbine."

10 years. My pension today is about \$250 a month. It's better than it was before.

I am totally against shutting down the Chernobyl power station. Furthermore, I am a patriot of this station. I have given it so many years of my life. If it weren't for the amount of exposure I received, I would still be working there today.

Who is to blame for the accident? The operators were blamed for everything, and they still haven't been exonerated. But blame can be assigned [elsewhere]. The blame falls on those who built the station too quickly, and those who claimed to have finished each unit before the deadline, communist-style. Blame probably also falls on those who organized the experiment on April 26, 1986. We received no instruction on that day, so cocksure were they that the atomic power station was as safe and secure as an electric kettle. Nobody even thought it could explode. The people who were on duty that night, what did they do wrong?

A group of us who survived used to go to Moscow on April 26 to visit our comrades at the Mitinsk cemetery. It was hard to be at those graves: death took them and spared us. But we could have been lying there too. Of the nine members of the turbine shop team on duty that night at Unit 4, five have died in the hospital of radiation illness.

Today, since the Soviet Union fell apart, trips to Moscow are too expensive. We don't

have the money. So we get together in Kiev and drink to the souls of the departed.

Yuri Korneev

* * * *

Nikolai Gorbachenko, a radiation monitor at the Chernobyl station, was at work at the time of the accident. He had worked at Chernobyl since 1976. Now 42, he is married and has two children and a three-year-old grandson. He believes he was exposed to 300 roentgens.

Radiation monitors at atomic power stations are like scouts during war; they come in first and leave last. The radiation monitor measures radiation levels in the workplace before the workers come in. After the shift is over, he measures radiation levels again.

My shift began at midnight on April 26. I had to take measurements in the reactor rooms of Units 3 and 4, and check the data units. I checked Unit 3; but on my way to Unit 4 I remembered it was in the process of being shut down, so I decided there was nothing for me to do there. I was really lucky that I wasn't at the reactor when it exploded.

I returned to my duty room to have some tea. Then we heard a flat and powerful thud. My colleague and I decided the turbine operators had produced a hydraulic hit, which sometimes happens during the shutdown of a turbine. At that moment we heard another flat thud. The lights went out; the light on the control panel of Unit 4 went out as well. Just as in a horror film, the blast blew out the double doors that had been latched. Black-red dust started coming out of the ventilation vent. In a few seconds, the emergency lights went on. We put on our gas masks and tried to make a call, but the phone wasn't working.

We had dosimeters that measured up to 3.6 roentgens per hour. They immediately went off scale. My boss sent me to Unit 4 to find out what the radiation situation was like there. I went to the turbine room and walked around. It was pitch black, but I had a powerful flashlight. There were pieces of concrete everywhere. With my low-power dosimeter, I wasn't able to measure the radiation level. I returned to my post and told my superiors what I'd seen.

Then two guys walked in. They said: "Hey, buddies, help us find a comrade of ours, Vladimir Shoshunok. He's been gone for 30 minutes and we haven't heard from him. He's supposed to be on the upper landing across from the turbine room."

So I went with the two men to look for their comrade. In the darkness we made our way through piles of rubble, and went up to the landing. Everything was in shambles, steam was coming out in bursts, and we were up to



Nikolai Gorbachenko

Armenia's leftover heroes

Armenians who responded to the Chernobyl disaster find themselves today miserable and abandoned. Since the dissolution of the Soviet Union, they have received little in the way of medical treatment or financial support. "What can I tell you? They've let us down, just left us to the mercy of fate," explains Aramais Petrossian, a Chernobyl volunteer. "In 1986, we were told that we were heroes, that we were saving humanity. Now no one wants to speak for or listen to us."

Petrossian, 40, was one of 3,000 Armenians—professionals from the Armenian nuclear power plant and members of the military called up for three months of service in the Soviet army—who rushed to provide assistance. Many now suffer from radiation-related illnesses or illnesses that may have been caused by Chernobyl-related stress. Petrossian, who received an estimated radiation exposure of 180 roentgens, is bedridden.

Before the Soviet Union collapsed, many survivors received special treatment in Ukraine. But facilities in Russia and Ukraine, which are equipped to provide advanced treatment to radiation victims, no longer treat nonresidents. Ukraine asserts that as a victim of a Soviet-designed nuclear plant, it is not obliged to compensate victims for the impact of the catastrophe. "We don't know who to blame—the Soviet Union that sent people to Chernobyl no longer exists," Petrossian says.

The burden of caring for these men fell to Armenia, a country unable to afford their treatment. With the country mired in poverty and beset by ethnic war with neighboring Azerbaijan, the predicament of the Chernobyl survivors is not a high priority. "Unfortunately, we have extremely limited finances at our disposal to provide basic medical assistance, even for those patients who were subjected to high radiation doses," says Nikolai Hovhannesian, head of the Radiation Research Institute of Armenia. All the government provides is a pension equivalent to \$5 a month for those unable to work—compared to the \$65 a month received by Russian liquidators.

In an attempt to compensate for government neglect, the "Victims of Chernobyl Committee" was founded in 1987. Since then, it has tried to draw attention to the plight of its 2,500 members, according to committee chairman Konstantine Sahakian.

But because of the country's dire economic circumstances, the committee's efforts have been largely ineffective. It receives no government support and instead must rely on membership dues paid by the survivors. Many of them, however, are too impoverished to support the cause. "The average salary in Armenia is \$10 to \$15 per month. We don't even have an office at our disposal, as everything costs money," says Sahakian.

And things are only getting worse, Hovhannesian adds. "It seems that in the course of time the issue of Chernobyl is losing urgency, while annual checkups show that the health of our registered patients is gradually becoming worse."

The noble gesture of the Armenian volunteers at Chernobyl has ended in bitterness. "I was a volunteer, but if I could go back to 1986 I'd never go to Chernobyl," says Petrossian. "I don't know how much is left for me to live. But I have two kids and I have to think about how long I can be their father."

—Astghik Vardanian

Astghik Vardanian, a Bulletin visiting fellow, researches and reports on environmental issues in Armenia.

our ankles in water. We made our way to the structure where the man we were looking for was supposed to be. We went inside and saw there was nothing—concrete slabs of the outside wall had been thrown to the street by the force of the explosion. It was night—darkness and dust everywhere. It was impossible to see anything. Even when you shone a light, the ray just vanished somewhere. We began to call to Volodya.

**"At the spot on
my back where Volodya's
hand rested, I received
a radiation burn."**

Suddenly we saw him lying unconscious on his side, with bloody foam coming out of his mouth making bubbling sounds. We picked him up by the armpits and carried him down. At the spot on my back where his right hand rested I received a radiation burn. He died at 6:00 a.m. in the Chernobyl hospital, never having regained consciousness. The two guys who looked for him with me later died in a Moscow hospital.

When I returned to my post, I put on dry clothes and changed shoes. As a radiation monitor, I understood what was happening and the fate that awaited everyone who was at the station that night. Then we received an order to look for Valery Khodymchuk. Our search was unsuccessful. As we later learned, he died in the explosion.

At 5:00 a.m., I started to feel terribly weak and nauseous. I was taken to the hospital. A friend of mine, who worked in the emergency room, saw me in the waiting room. He took me aside, gave me 500 grams of pure alcohol, and told me to drink that. I drank it and washed it down with water. Then I called my wife and told her I was O.K. Later on, the doctors told me that the alcohol, which I drank on an empty stomach, helped me a lot.

On April 26 there were already doctors from Moscow in the hospital. Seven or eight of the most difficult cases were flown to a Moscow hospital on the same day. They all died in that hospital. The rest went to Moscow on the following day. I was in the hospital for six months, from April 27 to October 27. It wasn't a pleasant sensation. You go to sleep at night not knowing whether you will wake up in the morning. Many died—often those who seemed to be getting better.

When I returned to Kiev in the fall of 1986, I received the lowest possible disability rating. I was given an apartment here, although I was also offered one in Moscow. I regret I didn't

stay there. The Chernobyl workers who moved to Moscow receive a much better pension than we do in Ukraine.

I worked until 1991. Then it became too difficult and I retired. [Although my disability rating was increased], my pension is small. My wife also doesn't work; she is sick. My children aren't doing well either. Their blood tests are bad and they have constant headaches. I check into the hospital twice a year for a battery of tests.

Who is to blame for what happened? Soviet science and the Soviet system. Everyone was scared; no one wanted to take responsibility. Everyone tried to hold on to their proverbial chair. Yes, such is our reality.

The firemen who went on the roof to douse the destroyed reactor with water have been turned into heroes. But the real heroes were those employees of the station who, without regard for their own lives, tried to save the station, Ukraine, and the world. And no one is concerned with them today. They hang out in hospitals, receive miserly pensions, and don't even have enough medication.

Nevertheless, I don't believe the Chernobyl power station should be taken off line. Too much money has gone into making it safe so that April 26 will not repeat itself.

For me, April 26 is a strange day, both of joy and of sorrow. On April 26, 1975, I got married. On April 26, 1982, I buried my mother. On April 26, 1986, during my shift Unit 4 exploded. And finally, on April 26, 1993, my grandson was born. So we drink on this day, both to health and for the departed.

Nikolai Gorbachenko

* * * *

Leonid Shavrej, a fireman at the power station, was on duty the night of the accident. Originally from Belarus, Shavrej was stationed in Ukraine during his army service and stayed on. He worked as a metalworker during the construction of Chernobyl. He ended up in the fire division "by accident"; his two younger brothers were also employed in the same unit. Now 44, he is married, with one son. He believes he was exposed to 600 roentgens.

At 8:00 a.m. on April 25, 1986, our group of 11 men began their 24-hour duty. The commander of the group was Vladimir Pravik—one of the first people to die of radiation illness. I was a squad commander.

The day of April 25 passed without any unusual occurrence. At 11:00 p.m., the commander told me to rest until 1:00 a.m. We rested without undressing, just taking off our boots.

Shortly after I lay down in the guard room, there was a loud thud that made the windows

rattle. I jumped up immediately. The emergency signal kicked in almost at the same moment. We jumped out on the street, ran toward our trucks, and heard the dispatcher yell that there was a fire at the atomic station. We looked up and saw a mushroom cloud; it also looked like the chimney above the Unit 4 reactor was half-gone.

Our team was at the station in four minutes. The smoke had dissipated and the chimney seemed intact. We connected the trucks to the fire hydrants. We didn't have dosimeters and, in any case, we were never instructed on how to work in radioactive conditions—despite the fact that the fire station was attached to a nuclear power station.

First we conducted routine scouting. Vladimir Pravik and I did the scouting. We entered the turbine room of Unit 4. We saw broken glass and pieces of concrete. There was so much vibrating that the walls were trembling. Our own portable radios weren't working. When we saw a phone, we tried to contact the dispatcher at the power station to find out what the situation was. We didn't succeed and went on. We ran around for about 15 minutes but didn't manage to find out anything, except for the fact that the bitumen roof of the turbine room of the exploded reactor appeared to be burning.

I ran outside, turned the trucks around, and, with the four firemen in my squad, climbed the outside stairs to the roof of the turbine room. We turned the hoses on and extinguished small fires. The cover of the roof was so hot that our boots were getting stuck in it.

When I climbed down for another hose, I saw the commander of our fire division, Major Leonid Teliatnikov. He was completely drunk and smelled strongly of alcohol. Teliatnikov gave us an order to stand guard on the roof of the turbine room. We carried out his orders. Thus we spent a few senseless hours on the roof with pieces of graphite from the reactor lying around us. We learned later how high the radiation levels were there at the time.

Later, Teliatnikov was awarded the highest order of recognition in the former Soviet Union for skillful firefighting in the first hours after the explosion of Unit 4. He was given the Golden Star of the Hero of the Soviet Union. After a while he was also promoted to major general.

We descended from the roof at 6:00 a.m. That's when we first felt an incredible weakness. We lit up cigarettes. The smoke tasted candy-sweet. A number of firemen had been taken to the emergency room earlier, including my two brothers.

My colleagues gave me a ride home. I told my wife to take our three-year-old son and go to the village where her relatives lived. I



Leonid Shavrej

couldn't eat, and I was afraid to drink vodka. Later, the doctors told me I should have had the vodka, since alcohol protects against radiation. When we were still at the power station, the senior engineer promised to give us pure alcohol. Unfortunately, he forgot.

Later, I visited my colleagues who ended up in the hospital with two other firemen. We drank 500 grams of vodka each. We washed it down with beer. On the following day, the firemen in the hospital were flown to Moscow. I felt very sick, but didn't check in. Only on April 29, after my first blood test, did I check into the Chernobyl hospital. After Chernobyl was evacuated, I was moved to the Ivanovsky hospital, 50 kilometers outside of Chernobyl. Then I was taken to Kiev, to the Ukrainian Institute of Oncology. I received a bone marrow transplant. It saved my life. I was released on June 11.

Nobody told me at the time about the radiation exposure I received; this data was secret then. I only learned about it in 1990, when I went to Israel with a group of Chernobyl firefighters and children from the Chernobyl zone. We were examined there and given certificates with our radiation doses. Mine says 600 roentgens.

Finally I was diagnosed with the "third level" of radiation sickness; the highest is the fourth. My brother Ivan has the second level, and my brother Peter the first. My brothers are still working. Ivan is a master sergeant at a fire station in Belarus. My older son Leonid is also a fireman. He is a master sergeant at Chernobyl, at the same station where I served in my own time.

I continued to serve as a fireman until 1994, but in Vyzhgorod near Kiev, not in Chernobyl. Now I am retired; my pension amounts to about \$60. My son Dima, who is 13 now, is not well; he has problems with his heart. The doctors told me that they had to operate on him, put in a pacemaker. Otherwise the child would die.

The Chernobyl accident created a rift in my life. Every April 26, I light a candle and drink 100 grams of vodka to the souls who departed because of Chernobyl. I hate Chernobyl, but I still feel that the station should not be closed. Otherwise, what was it all for? Why lose so many lives for it? Who is to blame for the accident? To this day I do not know.

Leonid Shavrej

* * * *

In April 1986, Yuri Andreev was a senior engineer at Unit 2 at Chernobyl. He had worked at the Krasnoyarsk and Smolensk power stations before moving to Pripyat in 1982. Since

1991, he has served as president of the Chernobyl Union of Ukraine, an advocacy organization for the thousands of Ukrainians who participated in the clean-up after the accident. Andreev is married, with two daughters. He believes he was exposed to 150 roentgens.

At midnight on April 25, 1996, my shift ended. I left before Unit 4 exploded. I spent the night of the 25th-26th at home, and didn't hear the explosion. At 9:00 in the morning, my wife returned from the market and said there were rumors in town that there had been an explosion at the station. I told her I didn't believe it, and I took my daughter out for a walk. I saw the streets of our town of Pripyat—with 55,000 inhabitants—being washed with a sudsy solution. There were also many police on the streets, and they were armed with automatic weapons. Although there were no signs of panic, everywhere beer and *kvas* [a fermented low-alcohol drink] were being sold from the tap.

After I saw all of this, I decided to walk to the edge of town, where I could see the power station, which is located two kilometers outside of Pripyat. I saw that there was only a wall left of the central building of the station, the one around the reactor. There was no roof, and a sliver of gray smoke was rising above the ruins. I understood immediately that reactor fuel was exposed to the atmosphere.

On the way home I noticed that there were a number of armored vehicles from army chemical intelligence, and soldiers with dosimeters. I asked one of the officers what the radiation level was. In response, he hastily blocked the scale from view and told me to mind my own business. One emergency vehicle after another headed from the power station to the city hospital.

On my return home, I didn't want to frighten my family, but I told them not to go out for any reason, and to wrap the shoes they had walked in today in wet rags and put them outside, and to conduct a thorough wet cleaning of the apartment.

My shift at the power station began at 4:00 p.m. [On the way to the station], the bus took a different route; it went on a detour past the cooling pond and the ruins of Unit 4.

I realized that what I had seen from town was nothing. I couldn't have imagined that something like this would ever happen. I saw parts of the reactor a person should see only once in his life—before the reactor goes on line. On the ground were pieces of the roof, thrown there by the force of the explosion, as well as drums from the separators, pieces of tanks from the emergency cooling system, and many other parts. It was obvious that the reactor was exposed to the atmosphere and



Yuri Andreev

"breathing." Toward evening you could see an even, dark purple glow above the active zone.

Our shift began with an order to shut down Unit 2. Everything started well, but then there was a glitch. During shutdown, the fourth turbine suddenly went off. Lights went out on the reactor's control panel. The alarm sounded. In a second the emergency light kicked in. But in this fraction of a second, I felt fully my helplessness before the nuclear ma-

**"I told my family
not to go out for any reason
and to put the shoes they had
walked in outside."**

chine. I felt with sudden intensity what my colleagues had gone through the night before, when they couldn't control Unit 4.

However the shutdown of Unit 2 was successful, as well as the shutdown of Unit 1. [Unit 3 had been shut down early in the day.]

The next day, April 27, the evacuation of Pripjat residents began. My wife and children went to the Zhitomir region, where my wife's parents lived. I remained at the power station, as did all the station personnel. At first we were taken to our shifts by bus, as before. Thus, during one round trip to work, we were exposed to 5 roentgens, the maximum considered safe as an annual dose. Later we were taken to work in armored vehicles. For a while after the accident, the station cafeteria was closed; all the stores in Pripjat were also closed. The town looked abandoned and frightening.

We were left to survive with an order to hold the station together. I didn't see any outside help. We had no dosimetric devices; the ones at our disposal didn't work. The most popular books for us at this time were whatever textbooks on hematology and civil defense we could find in the libraries. At least they provided some information on radiation and its doses.

And no matter what anyone says, the station personnel cannot be blamed for the accident. The blame lies with the person who ordered the experiment on Unit 4. This person ordered a working protocol for the reactor that wasn't identified in our instructions as potentially explosive or even dangerous.

I continued working at the Chernobyl power station until 1988. Then I began having problems with my health. I fainted at my work station several times. Incidentally, to maintain secrecy all the medical histories from 1986 were destroyed in 1989. Station personnel received new medical histories that no longer contained the results of their 1986

blood tests or their diagnoses.

In 1988 I had to look for lighter work due to my health. I am not feeling particularly well these days, but I try not to succumb to thoughts about health. My daughters are not very healthy either, especially the younger one. She has frequent headaches; three years ago she had a number of fainting spells.

In 1991 I was elected president of the Chernobyl Union of Ukraine. My monthly salary is about \$105.

Our organization protects the rights of those who suffered in the aftermath of the Chernobyl accident and who took part in its cleanup. There are thousands and thousands of such people. We verify the execution of the government's Chernobyl programs. Every year the amount of government money for these programs decreases. Last year a small chapel was erected in memory of those who perished as a result of Chernobyl. Toward the tenth anniversary we will be issuing 700,000 anniversary medals: one to each former Soviet citizen who took part in the cleanup of the Chernobyl accident.

It would be good to shut down the Chernobyl power station. But we can't do it; we don't have the technical, intellectual, or financial resources. The station has to continue working until it produces enough money for its shutdown.

How do I spend April 26? I can say only one thing: I spend it grieving.

Yuri Andreev

* * * *

Col. Anatoli Kushnin, chief of the chemical defense air force division, Kiev military district, served in the Chernobyl zone from April 26 to May 22, 1986. A member of the army since 1968, Kushnin graduated from the Military Academy of Chemical Defense in Moscow in 1977. At the time of the Chernobyl accident, he was chief of the air force's chemical defense unit stationed in the Kiev region; he is currently in charge of Ukraine's Radiochemical and Biological Defense Force. Now 46, he is married and has two daughters. He believes he was exposed to 130 roentgens.

I found out about the Chernobyl accident on the morning of April 26, 1986, when I came on duty. The duty officer told me about the accident and fire at the Chernobyl power station.

First I tried to find out what the situation was like at the station. I called the headquarters of the army's chemical defense forces for the Kiev military region. The senior officer there informed me that the radiation situation was bad as a result of an accident, but that there was no precise data available.



Anatoli Kushnin

In the meantime, the headquarters of the Kiev military region ordered an immediate transfer of pilots from the Kirovogradsky region to the airfield closest to Chernobyl. At 11:30 p.m. the regional air force commander, Major-Gen. Nikolai Antoshkin, and I drove to Chernobyl. We approached the power station by 2:30 a.m. A red glow was over it. We passed the station and went to the town of Pripyat. The liquidation [cleanup] headquarters were located at city hall.

We immediately got to work. In order to put out the reactor fire, the decision was made to

"The helicopter crews were exposed to enormous radiation doses. Pilots had to be replaced all the time."

dump sand over it from above. It was necessary to form teams to fill sacks with sand, which we later dropped into the reactor core. Then we dropped lead into the reactor. There was a supply of boric acid at the station. We also dropped boric acid. Since the rods used in stopping a nuclear chain reaction are made of pure boron, boric acid could help to retard the reaction as well.

Today we can talk a lot about whether things could have been done differently. However, to this day, no scientist has concluded that our actions were wrong during the liquidation of the accident at the power station.

All this work fell on military pilots. At the time, there were 80 helicopters and airplanes of various types deployed in Chernobyl. Every officer in our on-the-ground provision group was responsible for various aspects of this job. As the head of the chemical service, I was responsible for the radiation safety of the staff, for preventing military personnel from being overexposed, and for recommending appropriate safety measures. For example, I told the helicopter pilots to cover the floors of their machines with sheets of lead.

I was in Pripyat. The helicopter strip was located 11 kilometers from the reactor. I used a deserted military airstrip midway between these two points as a decontamination station for helicopters and pilots. Special technology was sent there. After flying above the reactor, helicopters were washed with special solutions and their crews showered and received new uniforms and shoes. The helicopters were returned to their base practically clean. Those machines that couldn't be cleaned remained within the 30-kilometer zone. We left helicopter engines, which couldn't be treated chemically, there as well.

Our military pilots worked zealously. I don't

remember a single case when someone showed fear, a lack of discipline, or disobeyed orders. By May 4 the pilots had buried the reactor core in sand despite conditions that were difficult and dangerous. The dosimetric devices on these helicopters measured radiation levels of up to 500 roentgens an hour. In the first days after the accident these dosimeters went off scale. The crews were exposed to enormous radiation doses during their flights over the reactor. Pilots had to be substituted all the time; afterward, crews were sent to a military hospital in Moscow. Not all of them survived. Recently, military test pilot Anatoly Grishchenko died in the United States. He was the one who tried to lift a huge dome over the exploded reactor with the biggest helicopter in the world, the Mi-26. He didn't succeed, but he was exposed many times to huge doses of radiation. He wasn't even told about that for a while.

Everything to do with radiation levels was top secret. In early June 1986 I signed for a coded government telegram received from Moscow listing 13 points about the consequences of the Chernobyl accident. It included radiation levels, among other things. This coded telegram was signed by General Secretary Mikhail Gorbachev.

I was also exposed to a significant dose. I was hospitalized with symptoms of radiation illness. My situation would have been worse had I not taken certain precautions while in Chernobyl. I believe that cloth masks only protect respiratory organs from large radioactive particles of dust, not from radioactive isotopes, which permeate the air.

I saved myself with cigarette smoke, as strange as that may sound. Along with the inhaled smoke, isotopes of radioactive iodine entered the lungs; then they got absorbed in the smoke particles and were exhaled along with them. In short, I always had a cigarette in my mouth, believing that nicotine would be less dangerous than radioactive isotopes. My first blood tests confirmed that they didn't get into my body in the first days of work at Chernobyl. Doctors couldn't believe that my tests revealed no abnormalities.

Nevertheless, I can't call myself a healthy man today. My leg hurts, and I limp when I walk. Often I have headaches. I head the Chernobyl Union at the central office of the Ukrainian Ministry of Defense, which consists of military men who worked in the aftermath of Chernobyl. Among other things, our organization procured the right for the officers who were at Chernobyl to retire five years before the legal retirement age, with a full retirement package.

I spend April 26 in a traditional fashion: I take a bottle of vodka and drink for those who

perished at Chernobyl. However I believe at this point the Chernobyl station should not be shut down. Its safety level right now is practically 100 percent. If so much has been invested in its safety, why take it off line?

Anatoli Kushnin

* * * *

Valery Starodumov, a senior engineer working in radiation safety, arrived at Chernobyl on June 6, 1986. His group of cleanup workers or "liquidators" were known as the "rooftop cats," because they cleared the roof—and other areas—of the most dangerous materials before other workers came in. Today Starodumov serves as chief of Ukraine's Department of Radioactive Waste Management and deputy director of the Ukrainian Government Committee on Nuclear Energy Uses. Now 52, he is married and has two children and a granddaughter. He believes he was exposed to 300 roentgens.

The day of my arrival at Chernobyl was my first day of work. When I arrived in the early evening of June 6, I found that there was no one to translate the operating manual for the two German robots, the F-1 and F-2, that we needed to work on the remnants of the roof of Unit 4. It took me all night to translate the manual.

Until June 19, I worked on finding a place for a special laundry for washing and treating the clothes of the liquidators. I also tried to analyze the use of various protective substances and working clothes.

Then I was assigned to a group jokingly dubbed the "rooftop cats" by the other liquidation workers. This group consisted of 32 nuclear experts, drawn primarily from military ranks; it was given assignments in the most dangerous and responsible areas. The head of the group, Yuri Samoilenko, later received the Hero of Socialist Labor medal.

The group's primary responsibilities were verifying the structural integrity of buildings at the power station, evaluating radiation doses, identifying radioactive hot spots in certain areas around the power station, evaluating the possibility of removing fuel from the reactors taken off line, and other such tasks.

Later we evaluated the feasibility of doing certain kinds of work on the roof of Unit 4. On August 30, 1986, we removed the most radioactive objects on the roof with our own hands. We made it possible for the deactivation workers to enter the breach that we cleared. On this day each member of our group received a "hit" of radiation of 30–35 roentgens. But we were able to lower the overall radiation field at the entrance to this area

from 1600 roentgens an hour to 800 roentgens. We did it by tossing the remnants of fuel assembly units thrown there by the explosion back into the reactor.

Army chemical defense units followed us on the roof and into other areas of the destroyed reactor. Many of them were exposed to high levels of radiation; I doubt that all of them are alive today.

All the mistakes that led to high radiation exposure of liquidation workers had to do with the fact that the people doing the work weren't professionals. If we had prepared those who worked on the reactor roof more thoroughly, if we had given them a year—better yet, three years—of preparation; if for this period we had conserved the station under dust-suppressing agents to avoid the release of radioactive elements into the atmosphere; we would have avoided the high number of casualties and saved our genetic heritage.

In 1987 I was in the hospital from July to October. My hair fell out; three hot particles were found in my esophagus and intestine. Since then I have not had particular health problems. The pension I receive as a liquidator at the Chernobyl power station is laughable. It amounts to a little over \$20 a month.

As far as the urgent need to shut down the Chernobyl power station, I think it's a made-up problem, more political in nature than economic. The world says the station is dangerous because it is located so close to Ukraine's European borders. However, if you compare the location of other power stations—Smolensk, Kursk, and Ignalina—that have the same kind of reactors as Chernobyl, they will be found to be even more dangerous to the West. I think the main issue here is the fight for a piece of the energy market. Recently a map from Germany and Austria came to my attention. You can clearly see lines going to Europe from the former Soviet energy system. The high-voltage line from Chernobyl stops in Austria—Chernobyl still exports energy and someone is interested in getting rid of competition in this market.

Furthermore, the Chernobyl power station supplies the high-energy consuming northern region of Ukraine. It would be impossible to do without this energy.

I believe the cause of the accident was the poor training of those who operated Unit 4 and those who planned the experiment. The personnel of the power station are to blame, not nuclear technology, which has been said to have a dark side after the Chernobyl accident.

On April 26, we get together with those who worked on the roof of Unit 4, those who are still alive. The first toast we raise is to those who are no longer with us. ■

Valery Starodumov



Valery Starodumov

Copyright of Bulletin of the Atomic Scientists is the property of Educational Foundation for Nuclear Science and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.