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the wake of the Chernobyl accident three years ago, the USSR established a special emergency rescue team. Rushworth M. Kidder describes the work of Spetsatom in the second of his two on-the-scene reports.

Soviet Disaster Team: Ready

By Rushworth M. Kidder
Staff writer of The Christian Science Monitor

CHERNOBYL, USSR

YURI SAMOILENKO is paid to think the unthinkable.

Right now that thinking is starkly simple: What if there's another Chernobyl?

Mr. Samoilenko, who was at the Chernobyl power station when the No. 4 nuclear reactor exploded three years ago, was awarded the Soviet Union's highest honors for his work there. Now, as head of a government-run special emergency response team called Spetsatom – thought to be the only team quite like it in the world – he's the one to call in case of a disaster.

Begun in March 1988, Spetsatom was founded primarily to deal with radiation problems. Its mission included both coping with Chernobyl-like emergencies and helping to decommission and dispose of old nuclear plants.

When the Armenian earthquake struck last December, however, Spetsatom personnel were among the first to arrive. So in January the USSR Ministry of Nuclear Energy broadened the Spetsatom mission to include disaster response of all sorts.

But foremost in Samoilenko's thinking is the issue of radiation emergencies. And just now, in a way that highlights both the need for international cooperation in a nuclear age and the barriers to it, he's puzzling about how Spetsatom could actually help.

He does have one thing in abundance: knowledge. Chernobyl was the worst radiation disaster in history. It far exceeded the accident at Three Mile Island in Pennsylvania in 1979, which occurred within a containment dome. And while the atom bomb at Hiroshima did far more explosive damage, it released only a fraction of the radiation that escaped at Chernobyl. Those who came through the Soviet experience learned unprecedented lessons about how to manage such situations. A number of them now work at Spetsatom.

One of the most valuable things learned, says Samoilenko, was the kind of equipment that should have been on hand. Chernobyl engineers did have several "robots" – small radio-operated tractors of Soviet and Western designs. But so intense was the radiation on the roof of the shattered reactor – the site most in need of immediate cleanup – that the robots' electronic gears broke down. At one point, Samoilenko recalls, when the Western-made "dollar robot" failed, he sent up the Soviet-built "ruble robot" to try to save it. It, too, broke down – forcing him to send men onto the roof to continue the cleanup.

In the end, it took 3,500 men, each allowed to work no more than a minute, to deal with the initial radiation problem. "That is insane," says his second in command, Viktor Golubyov, who was with Samoilenko at the Chernobyl explosion. "No one has to suffer," he adds.

That conviction prompts the Spetsatom search for better equipment. A flip chart in Samoilenko's well-appointed office, situated in an abandoned apartment block not far from the vast cement sarcophagus entombing the No. 4 reactor, shows drawings of 54 robots, from small humanlike objects to huge remote-operated cranes, dump trucks, and amphibious dredges.

These, plus a fleet of conventional vehicles and airplanes already in place, will eventually constitute the Spetsatom hardware. It will be operated by a team of 1,500 people – radiation chemists, robotics engineers, nuclear physicists, ecologists, computer technicians, drivers, and mechanics. Of these, 830 are already at work, with the balance to be added by the end of the year. This elite force is designed to be able to reach any disaster in this sprawling nation within 24 hours.

In the future, Spetsatom officials hope to sell its services to other nations as well. Contacts have already been made with Italy and France, Mr. Golubyov says.

"Our service, when developed properly, will help [in the aftermath of] all accidents abroad," he says.

Spetsatom is budgeting 4 million rubles ($6.7 million) in design costs for each of the 54 robots, and is lining up Soviet industries to help construct them. And Samoilenko is drawing up a 3 million-ruble ($5 million) "shopping list" of other items.

So far, however, most of the robots are still in the planning stages. The reason: The best robotic technology is in the West. "To do what they're up to, they need a technology that's beyond them," says William (Red) Whittaker, a leading US robotics engineer who designed robotic equipment for Three Mile Island recently and visited the Spetsatom team at Chernobyl. He praises Spetsatom personnel, however, for their "sincerity, drive, commitment," and notes that the United States has nothing comparable to the highly centralized emergency response team envisioned for Spetsatom.

For the battered Soviet economy, turning that vision into reality is not easy. "We have no convertible currency to buy robotic equipment," Samoilenko says.

In addition, he notes, some of the most needed equipment is embargoed by the West because it has military applications. Dr. Whittaker, who is director of the Field Robotics Center at Carnegie-Mellon University in Pittsburgh, notes that, with nuclear warfare still a threat, "electronics and computing ideas that survive radiation exposure have got to be very high on anyone's list."

"Exactly what you need to survive day-in, day-out work in a setting like the sarcophagus is maybe what you need to survive in a post-attack scenario," he says.

With or without his new generation of robots, Samoilenko plans to share the Soviet experience as widely as possible. "Right now," he says, "we're writing a book in which we are trying to summarize the experience."

There are 14 other reactors of the RBMK (water-cooled, graphite-moderated) design used at Chernobyl: 12 in the USSR, and one each in Britain and Japan. "To my mind," says Samoilenko, "that type of reactor is dangerous, and I think it was a big mistake to construct them."

In addition, there are more than 400 nuclear reactors in the world – 56 in the USSR alone. Before long, many will have outlived their usefulness and will need to be decommissioned. For that reason, say Spetsatom officials, their book should prove useful even in an accident-free future.