

The Lessons of Fukushima: Surviving Nuclear Disasters

Remembering the Sacrifice of Brave Nuclear Workers

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Valery Alexeyevich Legasov was a famous Soviet scientist, whose death in the spring of 1988 on the second anniversary of the tragedy at Chernobyl rocked the Soviet Nuclear Industry. At the time of the [Chernobyl disaster](#) on April 26, 1986, Legasov had become the First Deputy Director of the [Kurchatov Institute of Atomic Energy](#). His role was to investigate the cause of the disaster, and help plan for the mitigation efforts. He was a chemist, and extremely professional. “With our reactors, we may expect apocalypse any time” Legasov kept repeating in his meetings, but his words always fell on deaf ears. He had always carried a premonition of catastrophe, and constantly worked at the Institute of Atomic Energy to organize groups of experts to determine the safety of different types of reactors.

As the first victims arrived in hospitals in Moscow, Legasov was arriving at the Chernobyl Power Plant. He noted the glowing red sky long before he reached the workers town of Pripyat, and for the first time realized that it was from the fires at the reactor. Legasov was the first to comprehend what had actually happened, the reactor had exploded, everything that was inside, was either on fire or had been ejected outside of the reactor.

After arriving at Chernobyl, Valery boarded a helicopter and pursued an aerial view of the damage to the reactor. Later, he also received a large dose of radiation while traveling in military vehicles close to the reactor building to detail the damage and begin planning the cleanup. While prior to the disaster, he was known for his chemist experience, it was his knowledge of the situation, and of the design and functionality of a nuclear reactor that helped bring the disaster under control. He was the first person to demand that the population within the explosion radius be evacuated, and refused to listen to any government official or nuclear scientist, explaining non-action was criminal and must be stopped immediately.

At noon on April 27th, the local radio station in Pripyat, where the workers at the nuclear power station were housed finally aired the evacuation orders, some 36 hours after the initial explosion and meltdown. Legasov and other Soviet Leaders knew upon evacuation that those leaving would never return to live in the empty homes that cluttered the streets. The evacuees were not told this, to ensure that evacuation was not hindered by those who would be crippled with fear. By 2:30 pm, the town of Pripyat was a ghost town all 45,000 citizens shipped out in a few hours, leave for the military and those working at the plant.

On May 5th, Valery returned to Moscow for a political bureau meeting, he arrived his compatriots were alarmed to find his body covered in radiation, from fingernails to hair.

Legasov returned home to his wife and family where his wife was alarmed to see the nuclear suntan, a visible effect of acute radiation exposure. After spending only 35 minutes at home, Valery sped back to the Kremlin to speak at the meeting. At the Politburo, it was proposed to increase the acceptable levels of radioactivity for the population 10-50 times. It was also decided to send journalists into the unaffected areas for them to be re-assured and hastily return good and encouraging reports to the world.

Having been exposed to lethal amounts of radiation from spending over three months at the disaster site, the longest of anyone, the Soviet scientist began to feel the effects on his health immediately. His total dose is never known, as the humble leader would often hide his dosimeter as the readings would have caused orders to be drafted that would have prevented him from continuing his work. In August of 1986, Legasov sat before the IAEA and became a Soviet puppet, relating not the true facts of the situation at Chernobyl that he had collected at expense of his life over the previous 3 months, but the censored edited information that he had been ordered to give from the Soviet Atomic Energy Leaders. He delivered this information to a room of over 500 people who gladly bought every word from this knowledgeable, hard-working scientist who appeared to be the epitome of control in face of a crisis.

On the second anniversary of the Chernobyl disaster, Legasov was to present his plan to the Soviet Government, that would push them through the existing barriers to Soviet scientific progress, and his ideas were rejected. The scientist went to his office and retrieved his personal belongings and pictures and took them home with him. He was heard to say, "Sorry, but Chernobyl didn't teach us anything after all." Valery Legasov committed suicide, but left detailed memoirs in which he revealed the Chernobyl suffered from significant design flaws, and that he and other scientists at the Kurchatov Institute of Atomic Energy had known about long before the disaster. Before the tragedy at Chernobyl, the Soviet Government had kept all information about the weakness of its nuclear reactors a national secret. Before Chernobyl there had been numerous accidents at nuclear power stations, but engineers at the Chernobyl plant were not aware of the risks involved with the equipment they were using. After his death, the design flaws of the control-rods that were used at Chernobyl's nuclear reactors was declassified, and corrected. On September 20th, 1996 Russian President Boris Yeltsin posthumously appointed Legasov the honorary title of Hero of the Russian Federation for his courage and heroism at Chernobyl.

At Chernobyl, for the first time the scientists involved in the nuclear program had to make decisions also calculating human toll. Many of the efforts to bring the situation under control in the first few critical hours resulted directly in the death of those on scene. Chernobyl was also the final nail in the coffin for the Soviet Union, as it showed how unreliable the Kremlin had become at its foundation.

For the workers on-site at Fukushima Daiichi, and those in leadership positions since the disaster, the events of March 11th will be the most dramatic memories of their lives. During a disaster like that experienced in the control rooms at Fukushima Daiichi, it is easy to understand the reaction to going into shock. It can seem like everything that the workers on site knew about the situation was misleading them, once your systems are compromised, sensors and other data collecting equipment cannot be trusted until inspected and recalibrated. Sitting in the dark, everything that the engineers knew about their systems was completely destroyed, and they lacked the resources to get accurate data until the power was restored. The emergency workers who first responded on scene more than likely didn't

understand immediately that the situation they would be faced with would haunt their lives forever.

In the Japanese Government no one really cares about the safe and regulated expansion of its nuclear program and facilities. None of the efforts made by elected officials in Japan since the disaster at Fukushima have had a positive influence on nuclear policies or engineering. Instead this tragedy will go down as one of the most criminal examples of near-universal mismanagement and misdirection, a glaring recurring fact that has prevailed in nuclear disasters decades past. In hindsight it is easy to see that we have always looked to nuclear energy as a form of salvation, "an energy too cheap to meter", but some of our creations have led us to seek a salvation from our technology.

In the future we will look back at this disaster and its effects, and we will likely understand that the personnel on-site made their mistakes, and engineers were told of errors and found unwilling to correct the design. However, it will not be the builders, engineers, or technicians, who are guilty themselves, rather those high above them. The individuals that make up the State components of a nuclear powered economy, and those in positions that knew the dangers and risks both before and after the initial earthquake and tsunami.

Throughout history nearly every disaster has developed through the same pattern, in which multiple small and large mistakes or accidents occur. None of them is required to be individually devastating, but as the weight of these anomalies accumulates, it reaches the point of critical mass for a catastrophe. The only way to prevent these disasters is to have reliable and safe expansion of international energy programs.

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