

Crimea Loses Power for Two Weeks

December 2015

Most of the citizens of Crimea were without power from November 21 through December 8, 2015. No, it wasn't a cyberattack. It was sabotage in response to Russia's 2014 annexation of Crimea, which had been part of Ukraine. Ukrainian activists blew up the four Ukrainian power feeds that provide most of the electrical energy for Crimea, and the saboteurs then continued to prevent repair teams from restoring power.



Crimea

Crimea is a major land mass on the northern coast of the Black Sea. It lies south of Ukraine and west of Russia and is very close to both countries. Crimea is connected on its north side to Ukraine by the Isthmus of Perekop, a narrow strip of land. Crimea is only thirteen kilometers from its east side to Russia across the Strait of Kerch.

Russian Annexation of Crimea

After World War II, Ukraine became part of the Soviet Union. Following the collapse of the Soviet Union, Ukraine became an independent nation in 1991. Crimea, which is barely connected to Ukraine by land, became part of Ukraine following a public referendum.



The Ukrainian Peninsula

In March 2014, Vladimir Putin, Russia's president, reclaimed Crimea as part of Russia. He described the annexation as the correction of a historic injustice and brushed aside international condemnation. In a show of democracy, Russia allowed Crimea to vote in a referendum on whether they wanted to be part of Russia or remain with the Ukraine. The Crimean citizens, mostly Russian by background, overwhelmingly supported the annexation.

Ukraine, of course, does not recognize Russia's annexation and still claims the Crimean peninsula.

Crimea Loses Power

Crimea gets about 70% of its electricity from Ukraine. It generates the rest of its energy from gas and coal-fired generating plants within Crimea. Ukrainian electric power is sent to Crimea over four power lines that come into Crimea over the Isthmus of Perekop.

Crimea had experienced several total power cuts during the 2014/2015 winter, attributed by the Ukrainian authorities to repairs and technical problems. However, the outages were seen by Crimean residents as deliberate pressure from Ukraine on Russia in response to Russia's annexation.

On Friday, November 20, 2015, two of the electric power feeds from Ukraine to Crimea near the Crimean border were taken down by blowing up the pylons that carried the power lines. Two days later, the other two power feeds were similarly blown up. This denied Crimea two-thirds of its electric power and forced it to ration electricity. Power was resumed to hospitals and other vital services via backup generators. However, 1.6 million people were without power. Fortunately, the weather had not yet turned to a wintry cold. Daytime temperatures hovered around 60 degrees Fahrenheit.



A Downed Power Line Feeding Electric Power to Crimea from Ukraine

The saboteurs have not been found, and their identities are unknown. However, Crimean authorities suspect that they were Ukrainian nationals and Tatars. The Crimean Tatars, who oppose Russian rule, are an ethnic group native to the peninsula.

Ukraine's electricity-generating plants use gas and coal. Presumably, in response to this act of terrorism, the Russian gas giant, Gazprom, announced that it was cutting off all gas supplies to Ukraine because it had not paid its bills. Russia also threatened to cut off coal supplies. Fortunately, Ukraine had beefed up its gas-storage facilities and had arranged for additional gas supplies from Europe. Ukrainian authorities stated that they had 29 days of gas reserves.

Activists Prevent Repair Teams from Restoring Power

The Ukrainian government immediately sent repair teams to restore power. However, they found armed groups of Crimean Tatars protesting Russia's annexation of Crimea and patrolling the sites of the broken pylons. The demonstrators guarded the pylons and refused to let the repair teams near them.

Power Is Restored to Crimea

Fortunately for Crimea, following the Russian annexation, the Russians had laid plans to integrate Crimea more closely with Russia and to end its dependence upon Ukraine. Russia began construction across the Strait of Kerch of a 19-kilometer bridge connecting Crimea to Russia.

More important, Russia undertook the construction of facilities to provide an independent source of power to Crimea from Russia; and these plans were well underway. Russia was in the process of laying two 14-kilometer undersea power cables from Russia to Crimea across the Strait of Kerch. The power cables were scheduled to go into service by the end of 2015.

However, Russia managed to get one of the undersea power cables operational in early December. On December 8th, the Russian Energy Ministry announced that power had been fully restored to Crimea, ending two weeks of power shortages for the Crimeans. Russia expects that the second undersea power cable will be operational by the 20th of December. This will provide enough electrical power to cover 80% to 90% of Crimea's needs.

Additional undersea power cables that will double the electrical capacity to Crimea will be completed in the summer of 2016.

Also, the Ukrainian repair teams were allowed to repair one of the damaged power lines between Ukraine and Crimea. The power carried by this line suffices for about a fifth of Crimea's needs. The other three power lines are still being guarded by the activists and have not been repaired. In presumed support of the activists, Ukraine has not sent military forces to protect the repair teams.

Russia intends to build two gas-powered stations in Crimea. They will burn gas piped from mainland Russia, but these facilities are still in the planning stage.

Summary

To its credit and despite international condemnation of its annexation of Crimea, the Russians immediately planned to break Crimea's dependence upon the Ukraine.

We talk about building disaster recovery systems in our *Availability Digest* articles. These systems can continue the processing of critical applications should the production system fail. Russia took this a step further. As soon as it annexed Crimea (and perhaps even earlier), it began the construction of a disaster recovery system to protect a complete country from the failure of its power system. Russia's plans to make Crimea independent of Ukrainian power were almost completed when power from Ukraine was cut by the saboteurs. Russia was able to complete its undersea power feeds quickly so that it could provide Crimea with the power it needed.

The failover from Ukrainian electric power to Russian electric power was seamless and efficient. If Russia hadn't been so prepared with a good disaster recovery plan, the Crimean power outage could have been measured in months.

Acknowledgements

Material for this article was taken from the following sources:

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