

UK NEWS WEBSITE OF THE YEAR 2024

The Telegraph

Log in

[Q](#) | [News](#) [Sport](#) [Business](#) [Money](#) [Opinion](#) [Ukraine](#) [Travel](#) [Health](#) [Lifestyle](#) (e[See all Business](#)

The doomsday weapon Putin could use to cripple the West

The development of EMP weapons risks throwing the world back into the Stone Age

[Bookmark](#) [293](#) [Share](#)

Electromagnetic pulse weapons have the potential to knock out Western power supplies Credit: Imaginima/Istockphoto

**Andrew Orlowski**

11 January 2025 10:00am GMT

One evening as the summer of 1859 drew to an end, a telegraph operator in Washington received a tremendous shock. An arc of flame burst from Frederick W Royce's head to the equipment on his desk, and he passed out. His set was ablaze.

Wireless operators were being affected all over the world. "Everywhere the

wireless operators were being affected all over the world. Every where the instruments were jammed,” reported the Sydney Morning Herald. Sparks from telegraph wires even created minor forest fires.

The operators suspected it was somehow related to the spectacular aurora displays the world was enjoying that week, but they couldn’t be sure. “Red spires and clouds of green” were reported in Boston.

The sky was so bright that you could read a newspaper at night, from Canada to New Zealand. The world was experiencing an electrical super storm, which was thought at the time to be a terrestrial phenomenon, a kind of high-altitude lightning.

It was only when amateur astronomers like Richard Carrington, from his home-built observatory in Redhill, Surrey, began to compare notes over the next few days that the true cause became apparent.

The sun was erupting. A phenomenon known as coronal mass ejection, or CME, had supercharged the Earth’s magnetic field, sending surges through electrical equipment.

Today, a global event of this kind is named after him: a Carrington event. Simply put, it creates massive voltages that burn out electric circuits.

“A plasma on the sun creates a magnetic field, a shock wave, and that accelerates the particles towards us,” says Prof Richard Horne, head of space weather at the British Antarctic Survey, and chairman of the official group that advises the Cabinet Office on solar electromagnetic threats.

We have a day or two’s notice that the sun has gone wild, he warns – but that’s not that useful: “Even then, you still can’t say how big the magnetic storm will be. That depends on the polarity of the magnetic field, and you can only do that with half an hour’s warning.”

How a high altitude EMP works

A CME is one of three ways the sun can mess with us. Another is a solar particle event, which although less common can be just as lethal to our systems. Alarming, the possibility of a Carrington-style event is higher than you think – and it's not some tiny fraction.

There's a 4pc to 6pc chance that a Carrington event may happen in the next decade, or a 12pc over 79 years, according to another model. And we should be getting ready, for the consequences are far more lethal than they were in Victorian England when civilisation did not yet depend on electricity.

Today our high-voltage transformers would be fried, if connected to the grid, along with the embedded electronics in systems that pump key supplies such as gas. In fact, a direct hit like the Carrington event would disable so much infrastructure that the consequences could be fatal.

High-voltage transformers are the Achilles' heel of modern life. They are 400-ton beasts with a waiting list of three years if you want to order a new one. Even the US can only replace about a dozen a year, because of the huge logistical challenge of moving one. A Carrington Event would create a queue.

"All the countries in the Northern Hemisphere would be affected, from North America to Scandinavia to Japan: everyone is going to want new transformers," says Horne.

Even larger solar events have been discovered in recent history, which dwarf the Carrington event of 1859. Called Miyake events, these bursts have been recorded in tree ring and ice core data several times, twice since the birth of Christ, with the most recent in 993 AD.

However, the sun's turbulence is just one concern.

"Humans being what they are, we've learnt to weaponise it," Amaryllis Fox-Kennedy, a former CIA officer, told the Tucker Carlson Show recently.

During the Cold War, both America and the Soviet Union explored the idea of using nuclear explosions to create a silent electromagnetic pulse (EMP) to cripple an enemy. Details of the US project, called Starfish Prime, have subsequently been declassified, revealing those early scientists were surprised

by what they found.

“The nuclear blast caused an electromagnetic pulse larger than they thought,” says Horne. “It also caused a cavity in the Earth’s magnetic field, and the impact on the radiation belt lasted 10 years.”



Under Vladimir Putin, Russia may consider wielding electromagnetic pulse weapons against the West Credit: Alexander Kazakov/Sputnik Kremlin

So could Russia, China or North Korea use this catastrophic threat to hurt us?

“The next war is not the war we think it will be – it will be fought out in the electromagnetic spectrum,” says Jonathan Hollerman of Grid Down Consulting, an EMP researcher. “But here we are, still trying to build the fastest planes.”

Defence experts point out an obvious problem, however.

“You need a sufficient power level to cause damage over a wide area, and it’s hard to get that into a satellite,” says Thomas Withington, of the Royal United Services Institute.

It’s more likely that the weapons are used in a narrower sphere, for example, to

disable other space infrastructure, such as our GPS satellites. That alone can do immense damage, as our power systems now rely on GPS for timing signals.

Work on battlefield EMP weapons is well-advanced, Withington says. And don't be too alarmed by the terrifying Chinese propaganda clips showing thousands of small drones taking off at once. The UK is developing EMP weapons that can disable them all at once, silently.

"It's hard to see how you can do damage to a city without a ballistic missile," Withington says.

But whoever is right, the EMP threat is back on the agenda.

In his first term, Donald Trump signed an executive order making EMP protection a priority. Joe Biden scrapped it, but with Trump returning to office, it's likely to become a priority. Fox-Kennedy is the daughter-in-law of Robert F Kennedy Jr, and is being touted as the deputy director of the CIA, according to reports.

Unlike many doomsday scenarios, however, this one should not leave us feeling entirely powerless. If we can rapidly disconnect our valuable transformers, they may well be spared. A simple metal frame, or Faraday cage, mitigates the electromagnetic pulse.

"Faraday cages are comparatively simple, and really cheap," says Lord Arbuthnot.

The Tory peer has doggedly kept the issue of the EMP threat alive in Westminster, in the face of bureaucratic indifference. That is something he's used to given that as an MP he took up the case of the sub-postmasters in 2009. His role even led to him being portrayed in the ITV drama *Mr Bates vs The Post Office*.

Other mitigation methods include disconnecting equipment at short notice or diverting the vast surges of electrical energy.





A rocket carrying a spy satellite is launched by North Korea. EMP weapons could disable space infrastructure Credit: KCNA/KCNA via Reuters

“You don’t stop the current, but it gets redirected,” says Horne, citing the work of New Zealand’s Craig Rogers on mitigation strategies. But someone has to make this a priority.

Arbuthnot sees some progress, but wants more.

“Officialdom is beginning to recognise it as a problem, and that’s a very good first step,” he says. “But recognising there’s a problem is not enough.

“We are not yet at the stage where enough is being done to protect us.”

Withington agrees: “It’s like the advice that you get your boiler serviced in the summer before winter. Governments have to think about it now.”

Astronomical event

In government, that duty falls to Pat McFadden, who as the Chancellor of the Duchy of Lancaster is the minister responsible for our critical infrastructure. It is down to him to avert a potential doomsday with the minimum of expenditure.

“How do you persuade the Chancellor of the Exchequer to spend money on an astronomical event when there are schools or hospitals that need attention?”

Arbuthnot asks rhetorically.

“We experienced a Carrington event larger than the 1859 just 10 years ago. It just happened to go in the opposite direction to the Earth,” he says. “If it had come our way, we’d be back in the Stone Age.”