



Scottish CND

CASTLE ZAPORIZHZHIA:

War fighting implications linked to the proliferation of nuclear power as part solution to climate chaos.

Bill Ramsay

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+44 (0) 141 357 1529

www.scottishcnd.org

scnd@banthebomb.org

Scottish CND, PO Box 3620, Glasgow G73 9FQ

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Figure 1 The Zaporizhzhia Power Station. image sourced from Wikimedia Commons under GNU Free Documentation License

The presence of the Zaporizhzhia power station on the front line of the Russo-Ukrainian war has firmly put the issue of the presence of civilian nuclear power plants in conventional non-nuclear battlefields into an unprecedented level of public focus.

This paper attempts to further inform this public discourse as well as touching on the potential proliferation of civilian nuclear power as a so-called part-solution to the looming threats and challenges of climate chaos.

There is the need, [as suggested by the International Atomic Energy Agency \(IAEA\)](#) to further develop legally binding frameworks that should apply to nuclear establishments that are situated in war zones particularly war zones involving peer or near peer protagonists. A possible starting point could be the bilateral [1988 India- Pakistan Non-Attack Agreement](#) . That coupled to the fact that the flag of the IAEA is now planted in

every nuclear power station in Ukraine means that in the longer, if not the short term there is a route, albeit tenuous route to de-escalate the conflict.



Figure 2 IAEA Team Approaching the Zaporizhzhia Power Station IAEA

The very presence of the IAEA on the Ukrainian battlefield presents an operational headache, possibly even a constraint for the war planners on both sides. This will become even clearer as I unpack some of the operational, even tactical conundrums the presence of a nuclear power stations has on a so called conventional non-nuclear battlefield.

The presence of nuclear power stations on so called conventional battlefields is a significant complication for the planners and prosecutors of conventional warfare. It is by no means certain the current belligerents, or indeed potential future belligerents would, as a matter of course, always agree to establish conflict free zones around nuclear power stations.



Figure 3 Map of Ukraine depicting land under Russian military control

Because the Zaporizhzhia plant (not to be confused with the town of the same name some distance away) is a nuclear plant, the issue has profound political implications too.

Operational warfighting decisions, indeed, even tactical decisions should, in my view, be in the hands of strategic decision makers. The naval operations of the belligerents involved in the blockade associated with the [1962 Cuba missile crisis illustrates this](#).

It is also worth noting that for the first time ever the annual [World Nuclear Industry Status Report](#) includes a chapter on Nuclear Power and War in its 2022 edition.

Expressions of surprise at the way the forces of the Russian Federation have utilised the Zaporizhzhia plant are somewhat disingenuous. We can probably assume that most military staffs have been considering the implications for many years, even decades.

The Russian Federation launched its invasion of Ukraine on 24th February 2022. Before the end of the day the Chernobyl power plant was in Russian hands. By 3rd April Russian forces had withdrawn, and the plant was back in Ukrainian hands. That the withdrawal by the Russians and the re-capture by Ukrainian forces was overtaken with little apparent fighting in or around the plant [is worthy of note](#).



Figure 4 Ukraine's nuclear sites

Incentives for the invaded to give up a nuclear plant without a fight, certainly a fight in proximity to a plant are strong. However, what "proximity to the plant" actually means will depend on many variables. Plans to capture will in all probability involve wide envelopment manoeuvres though seizure by coup de main appears to be how Russian forces initially captured Chernobyl and Zaporizhzhia.

On March 4th, 2022, the Zaporizhzhia power plant fell into Russian hands. Although a key Ukrainian energy asset there was no hard-fought battle, in or near it, to retain it.

Indeed, for the invaded and the invader there should be no hard-fought battle anywhere near to retain or to capture a nuclear power plant. To do otherwise courts environmental disaster, to say nothing of the widespread international diplomatic opprobrium for the belligerents it would generate.

On the other hand, civilian nuclear power plants are “elephants on a battlefield” that cannot be ignored. Moreover, inferential evidence of the conduct of both Ukrainian and Russian forces suggests that the respective staffs and political leaders on both sides had come to that inevitable conclusion long before hostilities commenced.

That this particular nuclear power station dimension of “conventional” warfighting has heretofore had a relatively low profile in the public discourse is understandable, though hardly commendable. Firstly, any operational procedures developed to cover this contingency, would, as a matter of course, be classified, that much, from a strictly military perspective is understandable.

However, reality dictates that the presence of nuclear power stations in a war zone hugely complicates conventional war fighting. Indeed, some militaries, particularly where they go into the fight from the perspective of not being a hegemonic military power with all that air dominance delivers it might even be seen as much more than a war planning complication.

Moreover the new operational inconveniences that are raised could cut across or clash with orthodox doctrines within military cultures, though cultural conservatism regarding war fighting is nothing new.

Military history is littered by examples, from the advent of gunpowder which challenged societal hierarchies in certain cultures to the implications on tactical doctrine of the advent of quick firing breechloading artillery in some militaries in the years immediately before World War One are but two cases in point.

Crucially, the advent of Zaporizhzhia also has the potential to undermine the case for smaller, simpler, less expensive nuclear power stations as a so-called green energy solution.

Additionally, the advent of the presence of a civilian nuclear power station as a “terrain feature” and potentially much more, on the “conventional” battlefield could undermine

public tolerance/support levels for future, ostensibly “limited” conventional military interventions, so common in the first two decades of the 21st century.

Clearly all of this and more has important national security implications not only for any country that has nuclear power stations on its soil, [but also globally given the potential spread of contaminants](#).

Importantly, it appears in my opinion, that most of the threat assessment implications are militarily negative for the invaded country, the country hosting the power station(s). On the other hand, negative implications for the invader are, at least at the operational level, if not the strategic level, less pressing.

As the media reportage about the Zaporizhzhia plant is extensive its political salience has grown. Consequently, the decision-making process shifts, from the operational to the strategic. Another lesson from the 1962 naval blockade of Cuba mentioned earlier.

The level of the contaminant threat may well be contested but [that it exists is undeniable](#).

As such publics will demand credible assurances and, in all probability, some specific responses to counter any potential threat, real or perceived.

There is a plethora of operational issues that need to be considered and what follows is illustrative, not exhaustive.

There are the implications for direct on-site close defence of the plant by its de facto garrison. Such garrisons face additional risks on top of the normal kinetic risks, the prospect of a lingering and potentially very long and not particularly glorious death is a real prospect. This could impact on the morale of the “garrison”.

The defensive perimeters of the plant would, if resources allow, be set as far “forward” or away from the actual plant as practicable. This could mean that the footprint of the defensive zone could be very wide. Consequently, the wider the zone the more likely nuclear factors would impinge on “non-nuclear” conventional operations.

There would be a public expectation that the military resources deployed to provide a defence would be significant. So much it might constrain other operations.

Given the high value of the intact capture by invading forces, diversionary operations around the plant might also feature.

This could lead to the development of a new 21st century iteration of positional warfare, and all that entails.

There is a prospect too that unless the defending forces were confident that attacking forces could be kept well away from the nuclear plant, then there might be an incentive to cede, and to cede early, the nuclear plant to the attacking forces. How that plays with publics, in non-totalitarian political systems is, to say the least, problematic.

Quite what “proximity” means from the perspective of the invader would of course depend on many additional factors including the mobility of the assets of the invading forces ranging from ground transport and air mobility. Countering a broad range of threats, anything from an attempted coup de main through to the threat of a slow attritional grind.

The possibility of multiple “Castle Zaporizhzhia’s” occupied by the invaders becomes a prospect if, in a future, less “balanced” conflict the invader was able to establish air superiority and quick capture. In such a circumstance viewed from the perspective of the invaded, civilian nuclear power plants, may well be considered all but indefensible. However other cultural factors relating to what sort of sacrifice is acceptable would be in play too. Operations that are effectively suicide or near operations are not confined to 21st century religious fanatics or the fleet air arm of the Imperial Japanese navy.

However, there are downsides for the invader to consider too.

Nuclear power stations cannot really be switched off. [Nuclear power stations in and of themselves require significant inputs of electricity in their “switched off” mode to keep them safe.](#) Consequently, the garrison would ideally include highly skilled specialists. A new career path for military engineers? Particularly amongst military reservists?

The garrison would need to ensure a higher than usual level of structural integrity, of operating safety, if only for themselves. Existing plant workers can, and as the example of Zaporizhzhia illustrates, be turned into [a captive specialist workforce doubling as de-facto hostages.](#) However, the stress levels amongst such workers would create additional dangers.

Although the occupation of an intact operable nuclear power station is a real prize in several ways, without careful maintenance, it has the potential to become a bit of a poisoned chalice, something not at all uncommon in the annals of warfare. [Operational success can from time to time translate into strategic defeat.](#)

On the other hand, if such a war becomes existential for one side or both sides, or where either one or both sides lack the resources or the inclination to keep the plant safe, questions of real urgency emerge, not just for the IAEA but for the Security Council of the United Nations emerge.

As the example of the Zaporizhzhia plant illustrates, future “Castle Zaporizhzhias” could therefore at one and the same time be a potential centre of communications, of logistics, of power projection, and even to some extent in a medium intensity conflict, subjugation.

As a multi-faceted military base, the civilian nuclear power station is almost invulnerable to all but an extraordinarily well coordinated special forces attempt at re-capture.

Normal conventional counterattack would be out of the question for a whole range of reasons. The prospect of creating a new Chernobyl could even potentially impact negatively on levels of international support.

Being defensible, it follows that it has value as a secure communications hub. High value equipment could be kept in various locations in the plant in comparative safety in the knowledge that it would be highly unlikely such assets would be on the receiving end of kinetic attacks. Long range indirect type or even line-of-sight direct attacks that miss could have dire consequences. Indeed, those consequences could be multiplied if the assets themselves were booby trapped by the garrison.

If the invader and occupier of the plant cared little about the impact on public opinion, for whatever reason, offensive long range indirect artillery or missile attacks could be launched from within the precincts of the power plant. Such strikes could be made, safe in the knowledge it would be unlikely that those assets would themselves be subject to counter battery fire.

There has been much media speculation around artillery or missile strikes on the Zaporizhzhia plant, both sides blaming the other. Claims that Ukrainian forces have fired

at the plant lack credibility though they do garner headlines.



Figure 5 Alleged missile attack

There is of course a more straightforward card that the invaders/occupiers could play. The production and export of electricity. However even that can create complications. Although originally of soviet design Zaporizhzhia plant has gone through many upgrades. Even if the original plant workers were replaced by Russian engineers, it does not follow that they are aux fait with the current 2022 plant operating procedures.

Indeed the Ukrainains, although assisting the IAEA, have no intention of allowing Russia to reconnect Zaporizhzhia to an electricity grid whether Russian or Ukranian, they will only do that if Ukraine's own nuclear authority are given back complete, unimpeded control of the plant, something that in military terms, from the Russian perspective is not a credible ask. Notwithstanding the bombing campaign of Ukrainian energy transmission infrastructure, which is a key feature of current Russian operations, local and not so local populations now do suffer shortages of electricity.

Paradoxically though, the fact that much of Ukraine's electricity generating capacity is nuclear means that Russia is has no intention of destroying. Rather it's the much more reparable transmission infrastructure that appears to have been attacked, repaired, and attacked again.

Heretofore the popular perception of 21st century conventional warfare in the West at least, is that it takes place on distant battlefields. Distant geographically, economically, and socially and therefore distant also in terms of electoral saliency. Though Western publics have generally tolerated such interventions they rarely wholeheartedly buy into interventionist wars that have been a common feature of western statecraft over the past two decades. The presence of nuclear power stations on future potential battlefields raises the bar for those who continue to propose expeditionary warfare as a political solution.

[The world has also moved on from COP 26 in Glasgow](#). There is an increasing realisation that climate breakdown/climate chaos is now inevitable. Moreover, it's generally accepted that climate breakdown is an additional generator of political instability that will almost certainly involve armed conflict. Will security stress tests be overtaken by countries where new so-called mini green nuclear power stations are to be sold? How rigorous will the export licences of the countries where nuclear power stations are produced be?

Currently there are around 448 civilian nuclear reactors, many admittedly housed in power stations of multiple reactors. Moreover, most nuclear power stations are in the countries with the most developed economies, generally in what are currently at least geopolitically stable regions of the world. Indeed, in only three - France, the Netherlands and, ironically Ukraine - is it over half of their electricity production.

This means that the issue of the proliferation of civilian nuclear power needs to be addressed through an environmental as well as a security lens, though from my own perspective they are inextricably linked.

Bill Ramsay

william993@btinternet.com

07971 752998

Bill Ramsay is a teacher. For the last 14 years of his career, he served as senior trade union official in the Educational Institute of Scotland. He is also chair of a small charity established by Scottish CND, [Peace Education Scotland](#).