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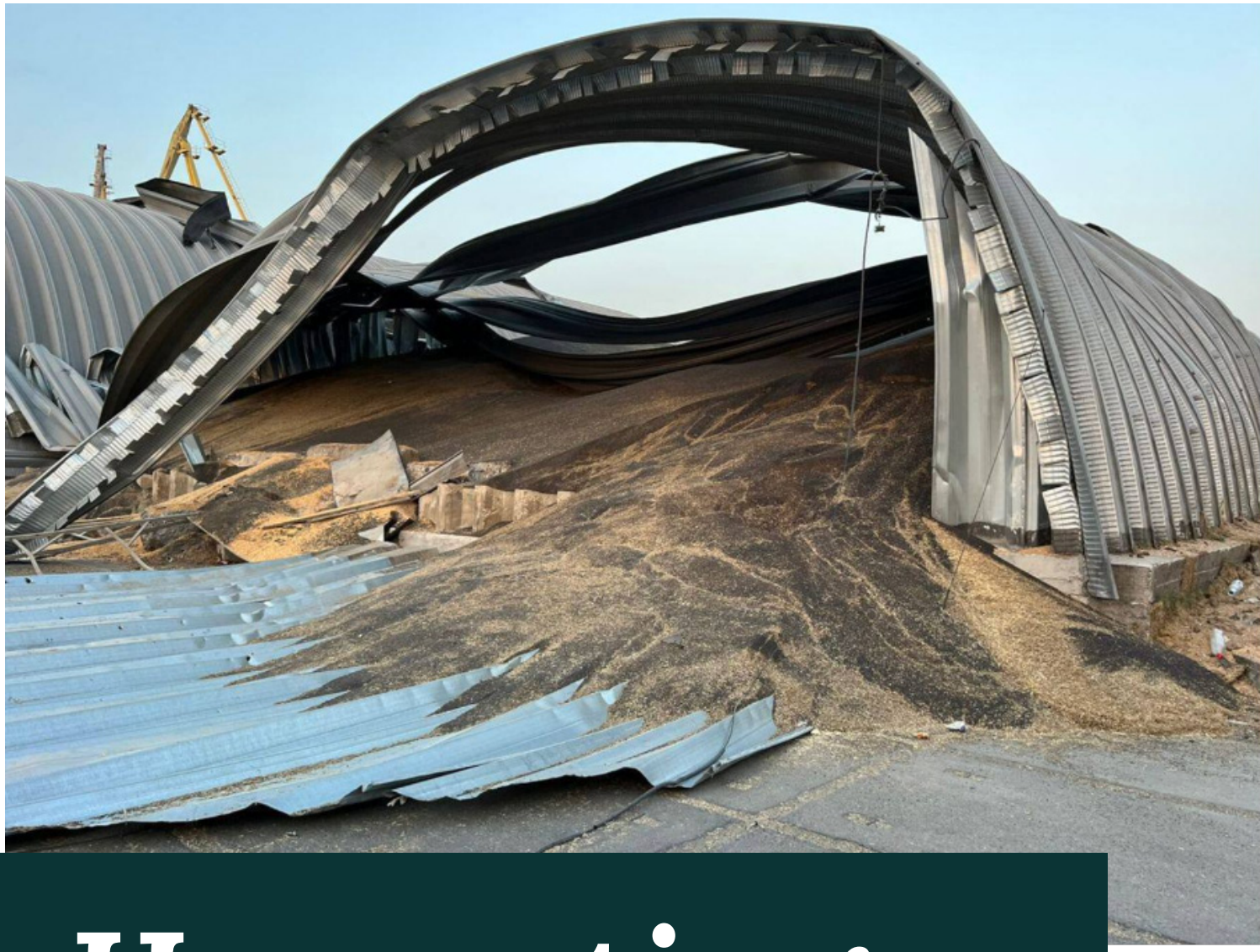

Harvesting Conflict

Unlawful Attacks against grain and related infrastructure in the Odesa Oblast

IMSL INTELLIGENCE | ANALYSIS | TRAINING

CIR CENTRE for INFORMATION RESILIENCE

Produced by

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This report is authored and published as part of Global Rights Compliance's ('GRC') Starvation Mobile Justice Team. The Starvation Mobile Justice Team (SMJT) is part of the UK, EU and US-sponsored Atrocity Crimes Advisory Group ('ACA') which was launched in response to the need of the Office of the Prosecutor General (OPG) to increase capacity to investigate and prosecute atrocity crimes perpetrated since the invasion by Russian Forces of Ukraine. Other partners include the EU Mission ('EUAM'), Pravo Justice and the International Law and Development Organisation ('IDLO'), while GRC's Starvation workstream is funded in part by the Kingdom of the Netherlands.

The Starvation Mobile Justice Team is one of multiple Mobile Justice Teams set up by international human rights law firm Global Rights Compliance – led by world-leading British human rights barrister, Wayne Jordash KC – to provide critical support to the Ukrainian OPG by assisting Ukrainian investigators and prosecutors on the ground as the conflict continues. The teams bring together leading domestic and international experts in the field of international criminal law, mass atrocity crimes investigations and case-building, as well as providing support to victims and witnesses.

The Starvation Mobile Justice Team is led by Catriona Murdoch and funded by the Kingdom of the Netherlands' Ministry of Foreign Affairs. The views expressed in this paper are those of the authors (Global Rights Compliance) and may not be or coincide with the official position of The Netherlands. For more information visit www.starvationaccountability.org

The findings in this report are the result of a six-month investigation by GRC, utilizing the findings of an investigation by Intelligence Management Services Limited ('IMSL') and the Centre for Information Resilience ('CIR'), which supported GRC as open-source consultants to investigate the widespread structure and logistics of extraction using their expertise and OSINT methods and tools. For the avoidance of doubt, GRC are the sole authors of the report and responsible for the conclusions therewithin. IMSL and CIR took no part in the drafting, including the context, legal analysis or conclusions.

Global Rights Compliance is an international legal foundation based in The Hague, Netherlands (with additional registered presence in the United Kingdom and Ukraine) which was founded by international lawyers with a mission to enable people and communities to achieve justice through the innovative application of international law. We have established a reputation as a leading supplier of humanitarian and human rights legal services across the spectrum of technical legal and policy advice, litigation, capacity-building and advocacy. GRC offers: (i) decades of proven expertise in International Human Rights Law ('IHRL'), International Humanitarian Law ('IHL') (the law of armed conflict), and International Criminal Law ('ICL'); (ii) an exhaustive understanding of documentation and how to use it for legal action; and (iii) proven experience in transforming data into relevant and probative evidence and international advocacy to generate measurable policy and justice outcomes. We possess unrivalled global expertise and granular knowledge on the crime of starvation and right to food violations, derived from a dedicated starvation portfolio established in 2017.

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Intelligence Management Services Limited is a UK based intelligence company that specialises in discrete in-depth investigations, delivering accredited and bespoke OSINT training alongside additional capability building intelligence services. IMSL provides professional intelligence services through its domain experience by solving contemporary intelligence and investigation challenges. IMSL solves these challenges through a conviction that informed data-driven decisions and insights deliver greater impact and value to an organisation. The IMSL team comprises specialist analysts with backgrounds in the military, law enforcement and corporate investigations. This diverse expertise is leveraged through comprehensive professional services, training and partnerships tailored to meet the evolving demands of intelligence and investigations. IMSL offers accredited Open-Source Intelligence and Intelligence Analysis training, as well as offering bespoke training solutions designed to address specific customer needs. By combining leading technology with deep subject-matter expertise, IMSL's analysts and trainers securely address customers' data, information, and intelligence requirements, providing tailored reporting and support for complex and sensitive investigations.

Centre for Information Resilience is an independent, non-profit social enterprise dedicated to countering disinformation, exposing human rights abuses, and combating online behaviour harmful to women and minorities. We achieve these goals through research, digital investigations, strategic communications, building the capacity of local partners, and collaboration with media to amplify the impact of our work. Working in partnership with affected populations, CIR employs cutting-edge research techniques and technology to capture, assess and verify open-source data that provides evidence of human rights abuses committed by authoritarian States and malign actors. We turn that data into live reporting, trend analysis and in-depth investigations, and produce in-depth data packages that are shared with donors, multilateral organisations, civil society and media working to hold those responsible for the abuses to account.

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Foreword by Office of the Prosecutor General of Ukraine

This unique report is more than a record of destruction -it exposes a deliberate strategy of warfare aimed at dismantling Ukraine's agricultural and export capabilities, and in turn a fundamental part of Ukraine's identity and way of life. Since the beginning of Russia's full-scale invasion, we have documented a disturbing and consistent pattern of attacks on Ukraine's agricultural sector. These include the unlawful seizure of grain across occupied territories, widespread kinetic attacks against our ports and agricultural equipment, and the broader incapacitation of Ukraine's ability to export and profit from its agricultural production.

In July 2023, Russia began its campaign of large-scale drone and missile attacks against grain and grain-related infrastructure situated across multiple Black Sea and Danube ports and other key facilities in Odesa Oblast. These strikes were not accidental-they were coordinated, systematic, and deliberate. International law is unequivocal: targeting civilian objects is strictly prohibited.

Grain elevators, machinery indispensable for grain distribution, grain storage sheds and warehouses – vital components of Ukraine's agricultural system — have all been severely damaged or destroyed. Each attack inflicts economic harm, disrupts civilian life, and sends shockwaves through global food markets, particularly in regions heavily dependent on Ukrainian grain. The infrastructure which has not been destroyed will take years to repair.

Against this backdrop, the Office of the Prosecutor General of Ukraine welcomes the release of GRC's report *Harvesting Conflict – Unlawful Attacks against grain and related infrastructure in the Odesa Oblast* and affirms its unwavering commitment to holding those responsible to account. Drawing on extensive open-source intelligence, satellite imagery, shipping tracking data, and weapons analysis, this report reveals a clear and intentional campaign of economic warfare targeting Ukraine's food system.

We are deeply grateful to the legal and OSINT experts who helped investigate, compile and verify this evidence. But this report is not an endpoint—it is a catalyst. It is a foundation for legal action, a tool for accountability, and a rallying cry for international resolve. Impunity for these specific crimes serves as an accelerant to their continuance.

Justice is not a political statement—it is a legal and moral imperative, essential to the dignity of every human being. As with GRC's 2022 *Agriculture Weaponised* report, this current report forms part of a broader effort to ensure that such crimes do not go unanswered and that those who order, enable, or execute them, are held to account

Ukraine will continue to stand firm, not only in defense of our sovereignty, but also in defense of the rule of law, the integrity of global food systems, and the basic dignity of human life. The Office of the Prosecutor General of Ukraine urges continued international attention as Ukraine enters its third year under sustained attacks on critical civilian infrastructure.

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GRC has been one of the main long-standing partners of the Office of the Prosecutor General of Ukraine and its regional offices. For the past eleven years, GRC's teams of experts have continued to support all aspects of our work, including by assisting our investigations, case-building, and prosecutions. The present report is the culmination of the collaboration with GRC's Starvation Mobile Justice Team.

Yuriy BELOUSOV
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I. Executive Summary

A Black Sea Stalingrad

Before Russia's full-scale invasion, Ukraine was a global agricultural powerhouse—exporting around 12% of the world's wheat and playing a vital role in the supply of food and fertilisers. The barbaric invasion shattered this stability, severely disrupting exports and exacerbating global food insecurity.

In July 2022, the Black Sea Grain Initiative ('BSGI') was launched by the UN, Turkey, Ukraine, and Russia to enable the safe passage of grain through Ukrainian ports. Despite this, Russia continued to obstruct exports through a de facto naval blockade and administrative barriers. One year later, in July 2023, Russia unilaterally withdrew from the BSGI and immediately began targeting Ukrainian grain infrastructure. Most of these attacks impacted storage facilities located within the Black Sea and the Danube ports essential to Ukraine's export activities, causing in many instances irreparable damage and injuries to civilians.

This report presents findings from a six-month investigation involving:

- The collection, analysis of information, including by cross-referencing official, mainstream, and social media sources;[1]
- OSINT and imagery analysts further reviewed visual User-Generated Content ('UGC') collected for purposes of geolocation and, when possible, chronolocation, in parallel to the review of low, medium, and high-resolution satellite imagery;
- Weapons Ordnance Munitions and Explosives ('WOME') specialists reviewed satellite and other images and videos pertaining to damaged infrastructure to provide an assessment of the most likely cause of damage and weapons used;
- Specialist review of mobile device data including tens of millions of unique Russian selectors, cross-referenced against over 2,600 Russian military sites and more than 300 sites that have been identified as possible Shahed supply chain facilities or launch sites. This led to the discovery of several details related to a person of interest, including their full name, DOB, tax ID number, and phone number; and
- Analysis of thousands of records of Marine Tracking Data to identify ships present at Reni and Izmail ports at the time of the reported attacks.

The analysis conducted by the SMJT identified deliberate attacks by Russian forces on grain and related infrastructure across the Odesa Oblast, including the ports at Chornomorsk, Reni, and Izmail, an agricultural company, and the Orlivka border crossing, a ferry terminal primarily handling grain.

The team reviewed numerous high-level Russian state and Russian propaganda statements explicitly acknowledging the intent behind these attacks—aimed at crippling Ukraine's agricultural economy, attacks which were described by Russia as "predictable" following the withdrawal from the BSGI.[2] On 21 July 2023, a Russian official state-sponsored propagandist stated that:

> **"[T]he war for them [the Black Sea ports] will be waged [...] without any mercy. [...] for the Western coalition, Odessa, Nikolaev and Izmail are a kind of Stalingrad. Without the Black Sea ports, Ukraine simply does not exist [...]."[3]**

Notably, Russian President Vladimir Putin declared Russia's readiness to replace Ukrainian grain exports, underlining a broader campaign of economic warfare.[4]

Within the timeframe analysed by GRC (July – October 2023), Russian attacks on the ports of Chornomorsk, Reni, and Izmail resulted in the damage or destruction of grain and grain-related infrastructure. Russian forces further attacked the in-land agricultural company 'Ivushka,' east of the town of Pavlivka, Odesa Oblast and the Orlivka Border Crossing, a ferry terminal primarily handling grain located in the same region. Beyond the temporal scope of this report, Russian forces continued to attack the Odesa Oblast unabated, with estimates of 113 attacks between January and October 2024 alone, allegedly targeting ports and other critical infrastructure.[5] Additionally, President Zelensky stated that, since July 2023, Russia has damaged 321 port infrastructure facilities alongside 20 foreign merchant vessels.[6]

This report follows GRC's 2023 publication, *Agriculture Weaponised*[7] and builds upon a confidential submission soon to be shared with the International Criminal Court and the UN COI on Ukraine. It has been reviewed by the Ukrainian Office of the Prosecutor General and confidential information shared from Ukrainian governmental counterparts formed part of the analysis and findings. The findings contribute to growing evidence that Russia's targeting of agriculture constitutes part of a broader strategy of aggression and destruction.

These attacks are part of a systematic effort to dismantle Ukraine's agricultural sector through occupation, destruction of infrastructure, and unlawful extraction. They form a pattern that extends beyond ports, to energy, water, and environmental systems—causing widespread humanitarian, environmental, and global food security consequences. The attacks on energy make it impossible to store critical food crops in proper conditions, causing them to spoil. Attacks on water infrastructure and transformer substations mean that agricultural areas are prevented from irrigation, this is in conjunction to repeated attacks on dams across Ukraine, often flooding rich agricultural areas and causing irrepealable environmental damage. The devastating impact of these patterns of attacks on Ukraine's agriculture and exports, on civilians and their way of life, and upon global food security, cannot be underestimated.

Preliminary Findings

- Following Russia's full-scale invasion of Ukraine in February 2022, Russian forces have allegedly targeted Ukraine's grain and related infrastructure through the following means:
    i. The unlawful occupation of territory, and illegal appropriation, extraction, and export of Ukrainian grain;
    ii. The initial *de facto* blockade of Black Sea Ports from February to June 2022;[8] and
    iii. After Russia's withdrawal from the Black Sea Grain Initiative in July 2023, through attacks against grain and related infrastructure located in the Black Sea and Danube ports, previously utilised to export grain.
- One of Russia's goals appears to have been to replace Ukraine as a top grain exporter worldwide, dismantling Ukraine's agricultural sector as a key source of national revenue. Had the Russian forces' goal been primarily military, one would expect to see more evidence of attacks on military objectives surrounding these facilities, which, based on an analysis of satellite imagery conducted by our experts, was almost absent.
- The widespread and coordinated kinetic attacks on grain and grain-related infrastructure in Odesa Oblast increased exponentially after Russia's withdrawal from the BSGI in July 2023, an initiative that was created to facilitate the safe export of grain, other foodstuffs, and fertilisers to world markets from operational Ukrainian Black Sea Ports.
- Numerous high-level Russian statements and prominent Russian-owned media outlets during and in the aftermath of the attacks investigated display clear support for the targeting of these civilian objects and their importance to Ukraine.
- Overall, the attacks featured in this report resulted in damage or destruction of a total of over 101.000 squared metred of grain storage area. Machinery crucial for the functioning of the grain export infrastructure was also rendered useless.
- These attacks strike at the heart of Ukraine's identity and will have reverberating and long-term impacts in terms of reconstruction, economic recovery, environmental damage and global food security.
- SMJT's investigation revealed that the attacks were launched using a variety of high-precision weapons, designed to strike designated targets with high-accuracy. The attack on Chornomorsk for instance entailed the use of multiple types of weapons and ammunitions and saw the probable involvement of units under strategic level commands. Such a coordinated attack would require authorisation from the Strategic Command of the Russian Armed Forces. Further, the use of long-range aircraft in combat requires a corresponding decision of the President of the Russian Federation.
- These attacks occur simultaneously alongside widespread patterns of attacks against critical civilian infrastructure across Ukraine which exacerbate the impact on agriculture.
- The SMJT found reasonable grounds to believe that, by launching the attacks outlined in this report, Russian forces committed the war crimes of attacks against civilian objects and destruction of enemy's property not justified by military necessity.

II. Methodology

Between July and December 2024, GRC's SMJT and open-source intelligence experts ('OSINT'), IMSL and CIR, undertook a comprehensive open-source investigation into patterns of attacks against grain and related infrastructure in Ukrainian ports and other facilities located in the Odesa Oblast after Russia's withdrawal from the BSGI.

The six-month investigation involved:

- The collection, analysis of information, including by cross-referencing official, mainstream, and social media sources;[9]
- OSINT and imagery analysts further reviewed visual User-Generated Content ('UGC') collected for purposes of geolocation and, when possible, chronolocation, in parallel to the review of low, medium, and high-resolution satellite imagery;
- Weapons Ordnance Munitions and Explosives ('WOME') specialists reviewed satellite and other images and videos pertaining to damaged infrastructure to provide an assessment of the most likely cause of damage and weapons used;
- Specialist review of mobile device data including tens of millions of unique Russian selectors, cross-referenced against over 2,600 Russian military sites and more than 300 sites that have been identified as possible Shahed supply chain facilities or launch sites; and
- Analysis of thousands of records of Marine Tracking Data to identify ships present at Reni and Izmail ports at the time of the reported attacks.

The open-source investigation conducted by GRC's SMJT and its partners followed a methodology developed by a team comprising of international lawyers and open-source experts from IMSL and CIR. The methodology, reviewed and endorsed by external legal and open-source evidence expert Professor Yvonne McDermott, adheres to best practice standards as set out by the United Nations Office of the High Commissioner for Human Rights ('OHCHR') and the University of California, Berkeley Human Rights Centre's Berkeley Protocol on Digital Open Source Investigations, and the Leiden Guidelines on the Use of Digitally Derived Evidence.[10]

The findings apply a "reasonable grounds to believe" standard of proof, consistent with most UN Commission of Inquiries or Fact-Finding Missions as well as the standard of proof required for the ICC to open an investigation. This standard is met when an objective observer, based on the facts presented, is satisfied that an incident has occurred as described, with a reasonable degree of certainty. However, it is of note that several OSINT factual findings met a "high probability" determination under the North Atlantic Treaty Organization ('NATO') scale. This goes well beyond the "reasonable grounds to believe" standard, required at the International Criminal Court to issue warrants of arrests.[11] Specifically, the "high probability" determination equates to an 80 percent and above likelihood of occurrence.

GRC's SMJT and its partners conduct all investigative activities independently and impartially.

Corroborating potentially responsible units and perpetrators through the use of cutting-edge technology

The SMJT employed a group of specialist analysts to acquire and analyse mobile device data that includes tens of millions of unique Russian selectors that were cross-referenced against over 2,600 Russian military sites and more than 300 sites that have been identified as possible Shahed supply chain facilities or launch sites.

This data was parsed, filtered and human-verified to provide insights into possible Shahed supply and launch activity in the weeks before, during and after the attacks under consideration. Research conducted by the providers of the data indicated likely parent units and formations associated to the device IDs. The locations and timings of these mobile devices associated to the Russian Military provided unique corroboration and intelligence start points that are complementary to the more traditional OSINT research methods.

Based on this data, a group of specialist analysts were able to identify a single device standing out for its strong association to key Shahed launch sites and supply and assembly plants. Specifically, this device was observed at these sites on multiple occasions, showing a digital signature indicating that the device's owner was highly likely part of the Shahed supply chain.

Further, the analysts were able to identify the owner of this device and uncover key details about this person of interest alongside the fact that he had attempted to obfuscate his involvement in the supply chain by using his wife's name on his corporate records.

III. Factual Findings

Immediately following Russia's withdrawal from the BSGI on 17 July 2023, Russian forces engaged in a pattern of attacks against grain and grain-related infrastructure situated in across multiple Black Sea and Danube ports within Odesa Oblast utilised as venues for export.

The SMJT's open-source investigation analysed a total of nine attacks launched by Russian forces on the ports of Chornomorsk, Reni, and Izmail, as well as the in-land agricultural company 'Ivushka' and the Orlivka Border Crossing.

Russian Statements and Rhetoric Surrounding the Attacks

By the end of July 2023, Russian State-owned media outlets purportedly exposed Russia's position after the end of the BSGI, to not only target the Black Sea ports but also Danube River ports.[12] Pro-Kremlin journalists outlined the reported necessity to destroy the critical infrastructure in these ports, specifically in Izmail, Reni, and Ust-Danube, to secure a naval blockade of Ukraine.[13]

In August 2022, Ukraine's economy suffered a 40 percent decline due to the reduced exports resulting from the Russian occupation or blockade of most of its seaports.[14] In response to the assessment, a journalist of the pro-Kremlin media outlet Komsomolskaya Pravda, Sergey Klyuchenkov,[15] declared that the fate of Ukraine entirely depended on the Black Sea Ports.[16]

Journalist of State-owned television channel Russia-1 Vladimir Solovyov also reiterated that attacks on Black Sea ports represented a logistical disaster for Ukraine.[17] Solovyov highlighted how control over Odesa, Mykolaiv, and Izmail was comparable to the battle of Stalingrad, as "*[w]ithout Black Sea Ports, Ukraine simply does not exist.*"[18] Russia would therefore "*hit the entire port infrastructure,*" including Odesa, Yuzhny, Izmail, and Reni.[19]

1. Attacks Against the Port of Chornomorsk

Merely 48 hours after the Russian Federation withdrew from the BSGI,[20] Russian Armed Forces ('RFAF') attacked the port of Chornomorsk, as part of a wider attack on the Odesa Oblast on the night between 18-19 July 2023.[21] The port, which participated in the BSGI,[22] is one of the major deep-sea ports along the Odesa coastline, on the North-West shore of the Black Sea,[23] approximately 25 kilometres south of Odesa city.[24.] It comprises a total area of 420,000 square meters[25] and has a capacity to handle up to 4 million tonnes of grain per year.[26]

On **19 July**, the Odesa Regional Administration reported that 'Onyx', 'Kh-22' and 'Kh-59' missiles, along with Shahed-136 Unmanned Aerial Vehicles ('UAV'), had been deployed in an attack targeting port and critical infrastructure, striking a grain and oil terminal in the Odesa [27]

A social media source confirmed that 'Onyx'-type missiles had been launched towards Odesa,[28] and the Ukrainian Air Force recorded the launch of cruise missiles from the south with Tu-22M3s aircrafts,[29] with User-Generated Content ('UGC') indicating a series of explosions in Chornomorsk.[30] The Chornomorsk Board indicated at 2:18hrs EEST that the port was burning.[31]

As a result of the attack, a junction of conveyer belts located in the central area of the port and serving to direct grain distribution either to storage silos or to ships for transportation was destroyed. This specific infrastructure was indispensable to the central port area to move and store grain, forming the largest part of the automated system moving grain from silo to silo, from silos to ships, and ships to silos. Nearby rail carriages also sustained damage in the attack.

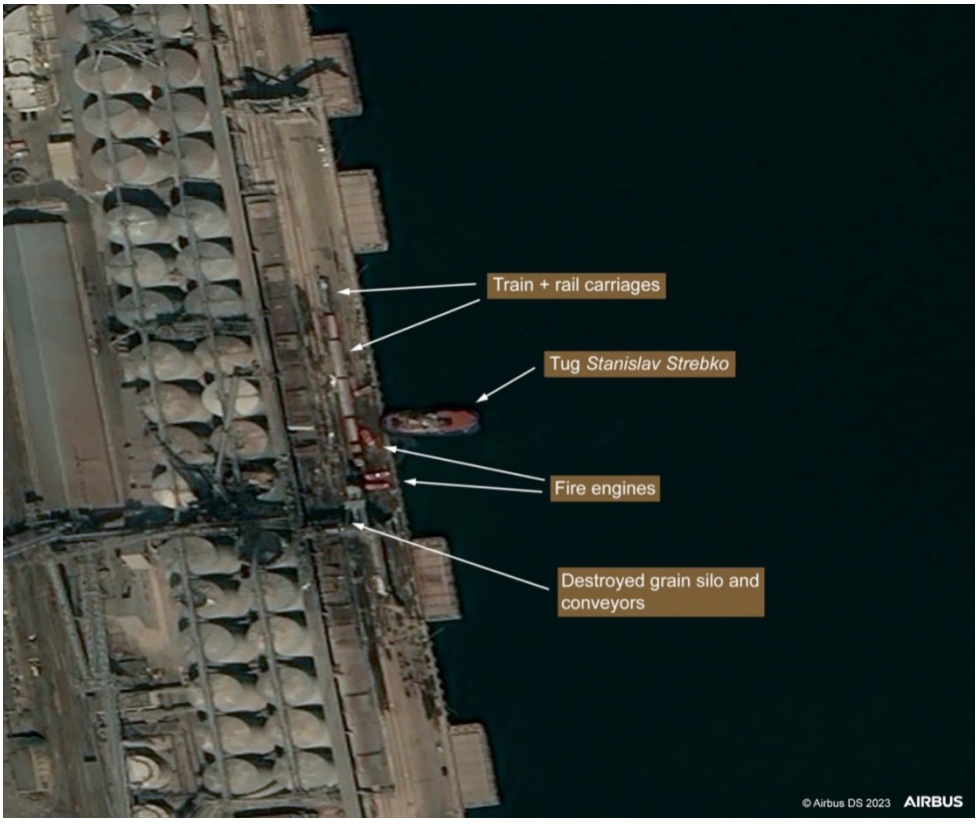

Figure 1: Satellite imagery dated 19 July 2023, showing damage to a grain silo in the port of Chornomorsk. © Airbus DS (2023) (annotated by GRC).

The attack also destroyed and/or damaged three large grain elevator silos located in the same area, damaging 60,000 tonnes of grain.[32] To give a sense of the scale of this attack, – this represents the equivalent of approximately 2,000 30ft long articulated lorries, full of grain, destroyed in a single attack.

The Ukrainian Ministry for Communities and Territories Development stated that grain infrastructure belonging to Ukrainian and international traders and carriers, including Kernel,[33] Viterra,[34] and CMA CGM Group,[35] were damaged in the attacks on Chornomorsk and Odesa ports.[36]

Both Kernel and Viterra possessed infrastructure at Chornomorsk Port,[37] while CMA CGM conducted export activities therefrom.[38] Kernel, a Ukrainian sunflower producer, estimated that approximately 40 percent of the total grain export infrastructure within the port had been rendered inoperative due to the attack.[39] Repairs are estimated to take 12 months to restore functionality.[40]

1.1 Potential Presence of Military Objectives or Dual-Use Objects

The SMJT's OSINT experts conducted an analysis of satellite imagery to assess the presence of military objectives and dual-use objects in the vicinity of the area attacked on 19 July.

Oil storage facilities. The port of Chornomorsk housed both grain and oil storage facilities, with satellite imagery from October 2022 showing both of them in adjacent positions in the northern and southern ends of the port. The grain infrastructure attacked on 19 July 2023 was located in the central area of the port, and approximately **330 metres away** from the nearest oil storage silo.

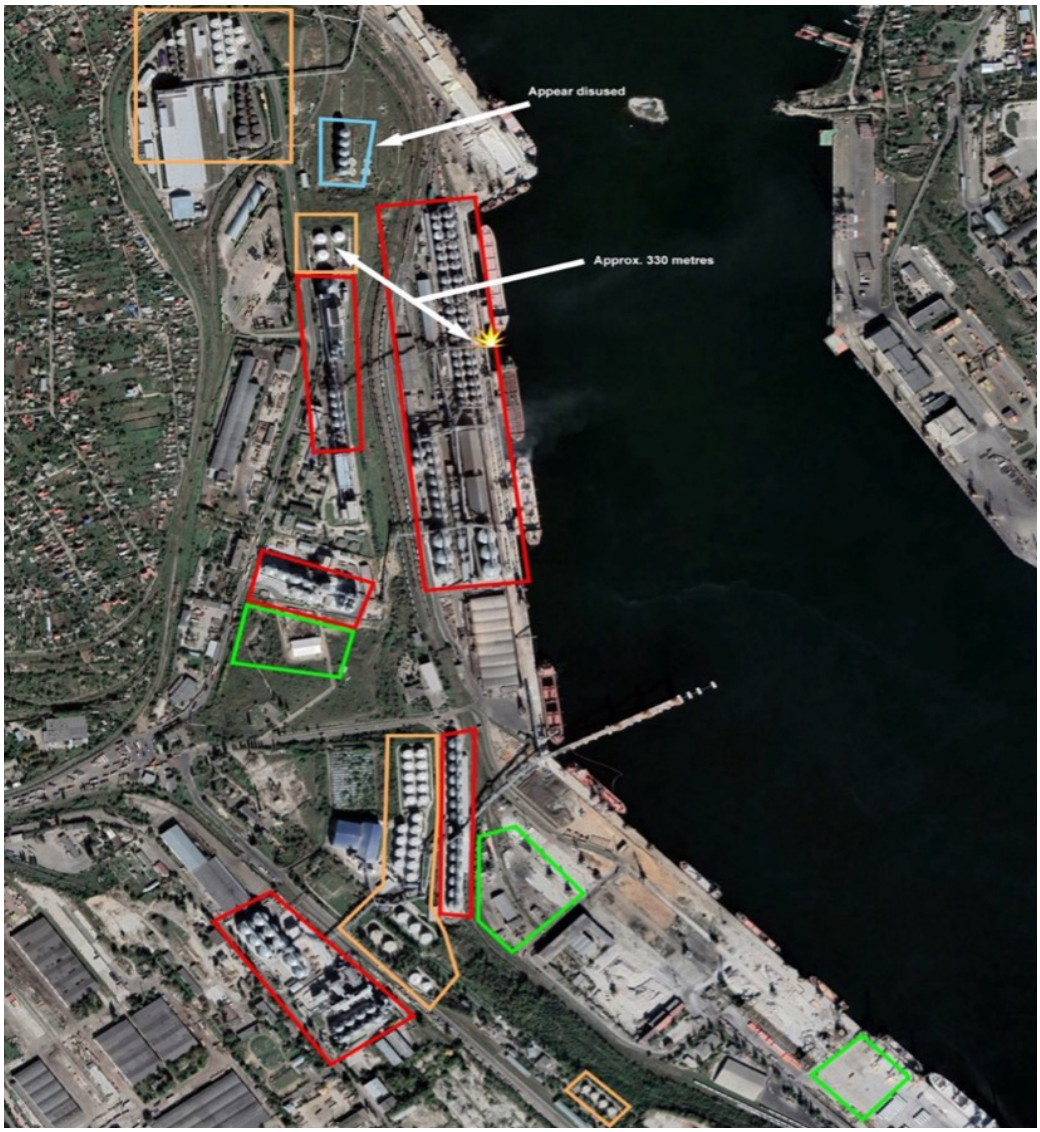

Figure 2: Satellite imagery dated 9 October 2022 showing the central area of the port of Chornomorsk port and highlighting the various areas used for grain (red box), oil (orange box), points of interest (blue box) and areas where new grain storage sheds have been constructed since the image was collected (green box). The area that was attacked on 19 July 2023 is also marked. © Google Earth (annotated by GRC).

The oil storage in the port's northern area was attacked between 6 and 11 July 2023. High-resolution imagery dated 19 July 2023 shows damage within the northeastern area of the port, with a single oil silo destroyed. Other oil silos immediately adjacent did not appear to have sustained any damage. The nearest grain silo to the attacked oil storage area is approximately 700 metres away. Of note, the southern end of the port did not sustain any damage, as shown by an analysis of satellite imagery conducted by the SMJT.

Figure 3: Satellite imagery dated 6 October 2022 showing the northern part of the port of Chornomorsk. © Google Earth (annotated by GRC).

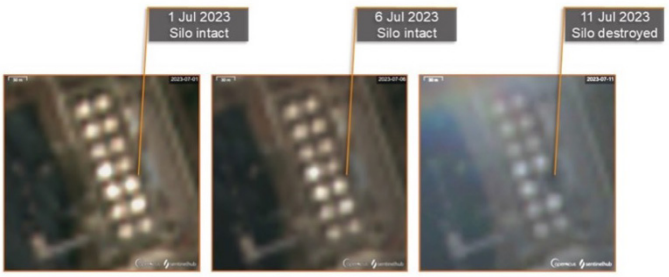

Figure 4: Satellite imagery dated 19 July 2023 showing a single destroyed oil silo. © Airbus DS (2023) (annotated by GRC). Figure 5: Satellite imagery dated respectively 1 July, 6 July and 11 July 2023 showing that the destruction of the single oil silo took place between 6 and 11 July 2023. © Copernicus Sentinel-2 Data [2023] (annotated by GRC).

Ukrainian Armed Forces. Given its relevance as a major Black Sea port, Chornomorsk was defended by Ukrainian forces. Analysis of satellite imagery dated 9 October 2022 indicates that Ukrainian forces were posted in at least seven locations, both in defence of the port and in-land (see Fig. 6). However, none of the observable Ukrainian positions are in the vicinity of the area attacked on 19 July 2023, with the closest position identified located **approximately 1.5 kilometres away**.

Some of the identified positions, such as a surface-to-air missile sites, would have represented strategically important military targets for RFAF. According to open-source analysts consulted by GRC, should RFAF have wanted to target military positions in the area, it would expected to find more evidence of damage at or in the immediate vicinity of such locations, rather than within the port.

Figure 6: Satellite imagery dated 9 October 2022 providing an overview of the area of the port of Chornomorsk with Ukrainian forces positions and attacked locations highlighted. © Google Earth (annotated by GRC).

2. Attack on 'Ivushka' Agricultural Company (Pavlivka)

The 'Ivushka' Agricultural Company is located in-land in Odesa Oblast, east of the village of Pavlivka. The main activity of the company is the cultivation of grain crops, leguminous crops, and oilseeds.[41] As of July 2023, the company possessed several large-scale grain storage facilities for the purpose of exporting grain. [42]

On **21 July** 2023, a section of the compound belonging to the Ivushka Company was reportedly attacked by RFAF Kalibr missiles flying at low altitude to avoid radar detection.[43] The attack consisted of two waves of strikes, involving a total of three to five missiles.[44] The first wave of missile strikes reportedly damaged grain warehouses, whilst the second one reportedly damaged the rescue equipment arriving at the location to extinguish the fire caused by the first strike.[45] Ukrainian media also reported that the two waves of attacks came at 3:30hrs and 4:30hrs EEST respectively.[46]

Furthermore, on 21 July 2023, NASA FIRMS data, at approximately 3:24hrs EEST, detected fires at the Ivushka grain facilities.[47] At the same time, the Ukrainian Air Force issued an alert for a missile attack on the Odesa region.[48]

The Head of the Odesa Regional Administration, Oleh Kiper, shared images allegedly depicting several grain storage warehouses either damaged or destroyed in the attack.[49] GRC geolocated this content to the Ivushka agricultural facilities. Through a combined analysis of satellite imagery and geolocated UGC, GRC assessed that 5,510 square meters of grain storage facilities were damaged or destroyed. Ukrainian authorities specified that 100 tons of peas and 20 tons of barley had been destroyed in the attack.[50]

Hours after the attack, the Head of Odesa Regional Administration indicated that the grain terminals of an agricultural facility in Odesa were struck again by Kalibr missiles, fired from a missile carrier deployed in the Black Sea.[51] The SMJT's analysis of imagery geolocated to the Ivushka facility indicates that at least one of the Kalibr missiles fired at the site was launched from a submarine.[52] WOME analysis concluded that the damage depicted in visual content was consistent with that caused by a missile or a glide bomb. According to this analysis, the facilities were struck with considerable accuracy and from a near horizontal trajectory. These findings are consistent with the high-precision nature of Kalibr missiles, with a circular error probable of 50 metres.[53] The circular error probable is the standard expectation for a weapon system's accuracy. With regards to Kalibr missiles, the expectation is that at least half of the projectiles will land within 50 metres of the intended target.

2.1 Potential Presence of Military Objectives or Dual-Use Objects

From an analysis of satellite imagery conducted by the SMJT there are **no potential military objectives or dual-use objects** at or in the immediate proximity of the 'Ivushka' grain facility.

3. Pattern of Attacks Against Reni and Izmail ports

The SMJT documented two attacks against the port of Reni, and three against the port of Izmail between July and October 2023, resulting in the damage and destruction of grain and related infrastructure.

The ports of Reni and Izmail are two of the biggest ports along the Danube River in Ukraine. Altogether, the Danube River ports have a shipping capacity of 26.95 million tonnes.[54] Approximately only 25 percent of this total capacity was in use prior to the full-scale invasion,[55] as most exports were shipped through the Black Sea Ports.[56]

The use of Ukraine's Danube Ports for commodity exports substantially increased following Russia's full-scale invasion and the diminished capacity of Black Sea Ports.[57] From January to October 2023, these ports doubled their cargo handling compared to the same period in 2022.[58] Grain was the primary processed cargo, totalling 18.3 million tonnes over the nine-month period in 2023.[59]

Russian Statements and Rhetoric Surrounding the Attacks

In April 2022, the Russian Ministry of Defence expressed clear knowledge that Ukraine's Danube ports had begun serving as an alternative route to export grain and other crops *in lieu* of occupied or blockaded Black Sea Ports.[60]

On 24 July 2023, a pro-Kremlin journalist asserted that missile attacks against Black Sea and Danube Ports would trigger insurance companies' refusal to insure vessels destined for Odesa, Reni, or Izmail.[61] The pro-Kremlin journalist estimated that the destruction of two specialised cranes within the port of Reni would prevent exporters from unloading cargo in the port for three to four years.[62]

That same day, a journalist of state-owned TV station Rossiya-1, subject to international sanction for her statements on the Russian full-scale invasion of Ukraine, declared that, following Russia's withdrawal from the BSGI, Ukraine had actively begun to use Danube Ports to unload foreign ships to bypass the blockade impeding the use of Black Sea ports.[63]

3.1 Attacks against the port of Reni

The port of Reni, serving both a maritime and river function, is located approximately one kilometre from the Romanian border.[64] The port's infrastructure includes many loading/unloading machinery and lifting devices. It can accommodate Roll-on/Roll-off lifting devices, and Roll-on/Roll-off vessels that transport wheeled objects such as agricultural machinery.[65]

Of the port's three cargo handling areas, only one is equipped to handle grain.[66] In 2018, the turnover of grain in the Reni port was approximately 710,000 tonnes,[67] while, by June 2022, Reni had already handled 560,000 tonnes of grain,[68] approximately 80 percent of the cargo handled for all of 2018. Amongst the corporations operating in the port, Reni Line Ltd handled the majority of grain exports, transporting it to Italy, Cyprus, Lebanon, Turkey, Liberia, and Syria.[69]

On 24 July and 16 August 2023 respectively, Russia conducted two attacks against grain and related infrastructure at the port of Reni, rendering a total of 9,440 square meters of grain-storage facilities useless.

Attack on 24 July 2023. The first attack on the port of Reni reportedly injured six people and destroyed a grain warehouse and other cargo storage areas.[70] Through combined analysis of satellite imagery and geolocated UGC, the SMJT identified further damage to three grain storage warehouses reportedly belonging to the Ukrainian private company "Trans-Expo". GRC assessed that 2,400 square meters of grain and related storage facilities were damaged or destroyed in the attack.

A video, verified by GRC, which was uploaded on YouTube on 24 July 2023, appears to depict an attack on Reni port filmed from the perspective of the crew of a bulk carrier moored at the port at the time of attack.[71] The ship was identified through the geolocation of open-source imagery, cross-referenced against Automatic Identification System ('AIS') data, to be the 'Akomena,' owned by Dandiship Ou, registered in Estonia.[72]

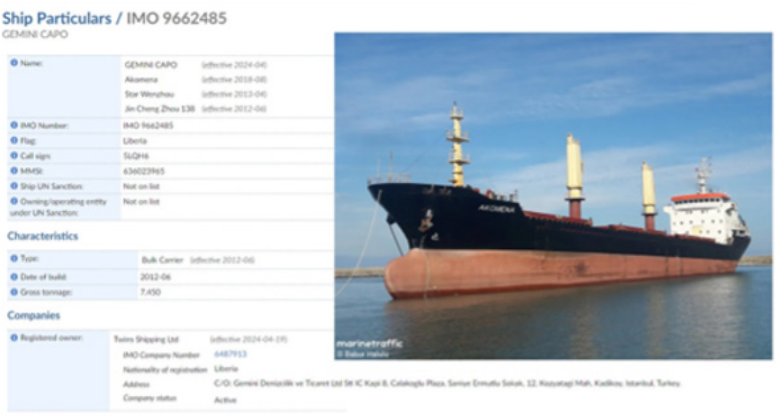

Figure 7: Details and photo of Akomena recorded via AIS analysis at the port of Reni on 24 July 2023.

The footage depicts damaged storage sheds in proximity to the bulk carrier,[73] and small arms fire can be seen and heard moments before impact. Also heard was the sound of a small propeller, which was confirmed by additional audiovisual UGC of the strike filmed from another ship anchored to the south of the port appears.[74]

Ukrainian officials stated that approximately 15 Shahed-136 (Geran-2) drones had been used in a four-hour attack against Reni port in the early hours of 24 July 2023.[75] Further UGC captured by witnesses was geolocated to the scene and depict the drone attack from several angles and distinctive sound associated with Shahed drones.[76] Machine-gun fire can be seen and heard firing from the ground towards the suspected drones.

Attack on 16 August 2023. The port of Reni was attacked again on 16 August 2023. Satellite imagery and geolocated UGC of the attack indicate that three grain storage warehouses belonging to private company 'Trans-Expo' and one belonging to the 'ALC Reni Elevator'[77] - both Ukrainian companies - had been destroyed, and another unidentified grain facility was damaged. Satellite imagery also appeared to show further damage to the 'Trans-Expo' site, sustained at some point between 8 August and 18 August 2023. GRC assessed that 7,040 square meters of grain and related storage facilities were damaged or destroyed in the attack.

Audiovisual UGC captured from a ship moored at the north end of the port appears to depict tracers from small arms fire or heavy machine gun, likely used as air defence, and an explosion on a large grain elevator next to the water.[78] Whilst the type of weapon used in the attack could not be confirmed from open sources, small arms fire or heavy machine-guns are most often employed against UAVs such as Shahed drones. It is rarely, if at all, employed to intercept high-speed missiles such as the Kalibr or Onyx P-800.

3.1.1 Potential Presence of Military Objectives or Dual-Use Objects

Oil storage facilities. Along with grain and related infrastructure, the port also has an oil terminal. The main oil terminal is in the central area and immediately to the south is a smaller fuel storage area. Satellite imagery analysis indicates that two large fuel silos appear to have been constructed within this area between October 2022 and July 2023.

Of note, many grain-related locations that were targeted in Reni port between July and October 2023 are located at a distance from the oil facilities. The grain facilities attacked on 24 July 2023 were at an approximate **690 metres** distance from the nearest oil storage. On the same day, five oil silos to the south of the main oil terminal were hit, with one silo destroyed.

Figure 8: Satellite imagery dated 28 July 2023 showing the southern area of the port of Reni. Three shelters and a warehouse have been damaged with the nearest oil or gas silo being approximately 690 metres away. Grain is also in open storage under makeshift covers.
© Airbus DS (2023) (annotated by GRC).

The grain facilities that were struck on 16 August 2023, are located **70 metres away** from the oil silos hit on 24 July 2023. Considering the accuracy of the strikes on the oil silo on 24 July 2023, our WOME and OSINT analysts determined it would be highly unlikely that the three strikes conducted on 16 August 2023 would be a failed attempt to hit the oil facilities nearby.

Ukrainian Armed Forces. Video footage published on the morning of 24 July 2023 and purporting to depict the attack shows heavy air defence artillery countering a drone attack near Reni port,

signalling the presence of UAF near the port at the time.[79] While it was not possible to determine through open sources where the air defence was located, as none were visible from satellite imagery from 28 July 2023, the ammunition tracer rounds can be seen coming from behind the trees in the video footage, suggesting that the units were located within the port perimeter.

Additionally, two military offices are located inside the city of Reni. Of note, satellite imagery does not appear to depict damage to the military office situated nearer to the port at any point during the multiple attacks on the port compound of July-October 2023. The nearest of these two offices is approximately **200 metres** from the northern perimeter of the port and approximately **620 metres** from the grain elevator targeted on 16 August 2023.

3.2 Attacks Against Izmail Port

The port of Izmail extends over 107.5 hectares, and it features three complexes equipped to handle cargo, including grain, and agricultural machinery.[80] Grain transported through the port is handled by the Ukrainian-owned Izmail Elevator Ltd, which has a total of 27,000 tonnes of storage capacity. Its equipment has an estimated maximum capacity for transshipment of grain cargo of 350 tons per hour.[81]

In the pre-conflict period, Izmail port was largely dedicated to the export and import of iron ore, coal and other by-products, with a minimal allocation of grain exports.[82] This changed substantially in February 2022, when the cargo turnover increased substantially, especially in relation to grain export. The percentage of port calls in Izmail rose from 2 percent prior to February 2022 to 28 percent in its immediate aftermath, remaining stable following the implementation of the BSGI.[83] In 2022-2023, Nibulon, a major Ukrainian grain trader, constructed new storage units in Izmail reportedly able to export up to 170,000 tonnes of grain per month.[84] Sentinel-2 satellite imagery analysis appears to depict at least 14 new grain storage sheds constructed over the winter of 2022 and spring 2023 at the west-end of the port.

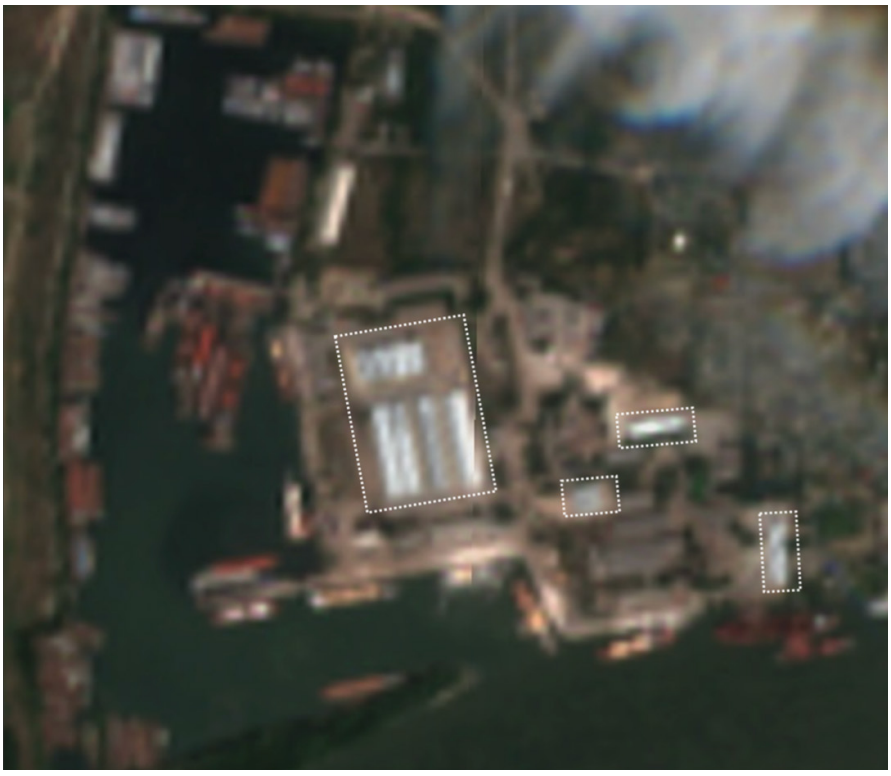

Figure 9: Satellite imagery dated 16 July 2023 showing new grain storage sheds at the west-end of the port. © Copernicus Sentinel-2 Data [2023] (annotated by GRC).

The SMJT identified three attacks against grain and related infrastructure at the port between July and October 2023. Overall, these attacks resulted in damage or destruction of a total of 26,687 squared metred of grain storage area.

Attack on 2 August 2023. On 2 August 2023, the Ukrainian Ministry of Defence and the Head of Odesa Region, reported an RFAF attack on a grain elevator at the port of Izmail.[85] The attack reportedly involved the use of UAVs.[86]

Russian Statements and Rhetoric Surrounding the Attacks

On the day of the attack, journalist of Russian State-owned media Rossiya-1, Olga Skabeyeva, defined the strikes on Izmail "predictable [as] after the cancellation of the grain deal, Russia [had] declared the northern Black Sea a hazardous navigation zone."[87]

Through a combined analysis of satellite imagery and geolocated UGC, the SMJT found that one grain storage warehouse belonging to the Izmail Elevator sustained damage and another grain storage facility was destroyed as a result of the attack. GRC assessed that 6,571 square meters of grain and grain-related storage facilities were damaged or destroyed in the attack.

GRC further analysed UGC from the scene published by the Minister for Communities, Territories and Infrastructure Development of Ukraine, Oleksandr Kubrakov,[88] appearing to show critical damage to a 27,000 tonnes grain elevator facility at the port.

Attack on 23 August 2023. On 23 August 2023, Russian forces attacked grain-related infrastructure in Izmail port for a second time. The UAF reported an RFAF drone attack on the night of 22-23 August 2023,[89] with Ukrainian air defences intercepting nine drones over Odesa Oblast.[90] That same day, pro-war blogger Borys Rozhyn published a video of "a nighttime kamikaze drone strike by a Geran-2 drone on a port in the city of Izmail, Odesa Oblast."[91]

The Ukrainian Deputy Prime Minister publicly stated that the aerial attack caused damage to several grain terminals and warehouses and had reduced the port's export capacity by 15 percent.[92] Additional media reporting indicated that the attack destroyed thousands of tons of grain.[93]

Through satellite imagery and geolocated UGC analysis, the SMJT identified three grain storage warehouses destroyed and a further two as having sustained damage. GRC assessed that a staggering 17,636 square meters of grain and grain-related storage facilities were damaged or destroyed in the attack.

Attack on 11 October 2023. On the night of 11-12 October 2023, Russian forces attacked grain-related infrastructure in the port of Izmail for a third time.[94] On 12 October 2023, the Ukrainian Air Force announced that 33 Shahed-131 and -136 drones, 28 of which were intercepted by air defences, were reportedly launched by Russian forces to strike grain storage facilities at Izmail,[95] with the Head of the Odesa Regional Administration also stating that ten Shahed drones had been intercepted. [96]

The SMJT identified the destruction of two grain-storage warehouses in the attack, resulting in either damage to or destruction of 2,480 squared metred of grain storage area.

3.2.1 Potential Presence of Military Objectives or Dual-Use Objects in Izmail Port

Oil storage facilities. Whilst Izmail port possesses infrastructure for handling liquid cargo,[97] satellite imagery shows no visible oil silos within the main area of the port, with just a small oil facility located further downstream, at an approximately **3 kilometres** distance. An oil facility of this type may be used for fuelling the barges that operate along the Danube transporting grain and other goods. This

facility was reportedly destroyed on 2 August 2023, thereby removing all potential oil facilities in the area before the second and third attacks were launched on Izmail.

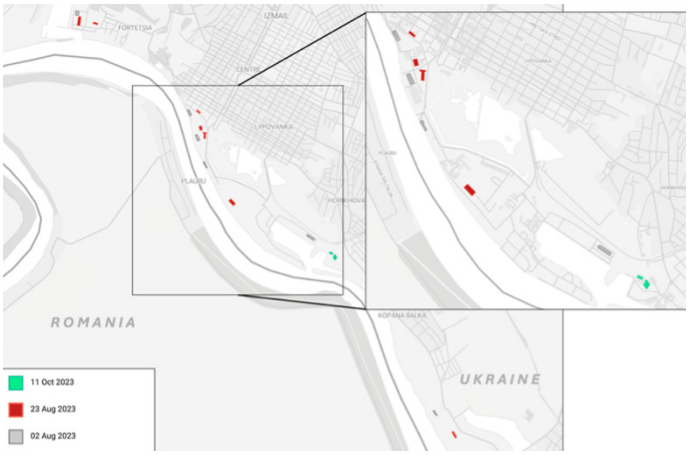

Figure 10: Satellite imagery dated 28 June 2020 providing an overview of the port of Izmail and showing impact areas, border guard training facility and communications centre, and small oil facility. Google Earth © (annotated by GRC). Figure 11: Map created by the SMJT on Datawrapper showing destroyed grain infrastructure at Izmail port, coloured by date of attack.

Ukrainian Armed Forces. Furthermore, satellite imagery from 28 July 2023 depicts two patrol boats moored within approximately 300 metres of a grain loading facility in Izmail Port, and approximately **560 metres** from the nearest impact site. Patrol boats conduct routine border protection and customs inspections along the Danube where it forms an international border with Romania. The shape and size of these vessels suggest that they are part of the Orlan Class of Ukrainian Border Control. Neither of these vessels appears to have weapons mounted on their bow.

Figure 12: Satellite imagery dated 28 July 2023 showing what appear to be patrol boats moored near Izmail Port Grain Loading Facilities. © Airbus DS (2023) (annotated by GRC).

Satellite imagery from July 2023 also shows earthworks approximately 1.2 kilometres downstream from the patrol boats, and several vehicles of apparent military profile immediately to the northwest of the earthworks. Wikimapia labels this location as "Izmail Border Service Detachment." Imagery from March 2023 displayed similar types of vehicles present in the same compound.

Historical satellite imagery analysis reveals that part of the earthworks have been present since 2013, with notable enhancements since. The earthworks and military vehicles are located approximately **1 kilometre** from the grain sites, all of which were hit by high-precision weapons.

4. Attacks Against Orlivka Ferry Border Crossing

Orlivka is a recently established border crossing point between Ukraine and Romania. It is located approximately 50 kilometres from Izmail following the Danube River.[98] From December 2022 to February 2023, the ferry terminal handled about 60 thousand tonnes of cargo, most of which was grain, purchased in large part by Turkish companies, as well as Romanian and Bulgarian subsidiaries of international corporations, including ADM and Bunge.[99]

In March 2023, the flow of trucks through the crossing had reportedly doubled due to ongoing military operations and the blockade of the ports of Greater Odesa.[100] The bulk of the traffic comprises container ships with grain bound for the port of Constanta, Romania. Of note, Orlivka also features two areas dedicated to loading and unloading cargo ships, mostly with grain.

Figure 13: Satellite imagery dated 26 September 2023 showing Orlivka. © Airbus DS (2023) (annotated by GRC).

Satellite imagery depicts two large storage sheds constructed between 21 June 2023 and 24 September 2023.

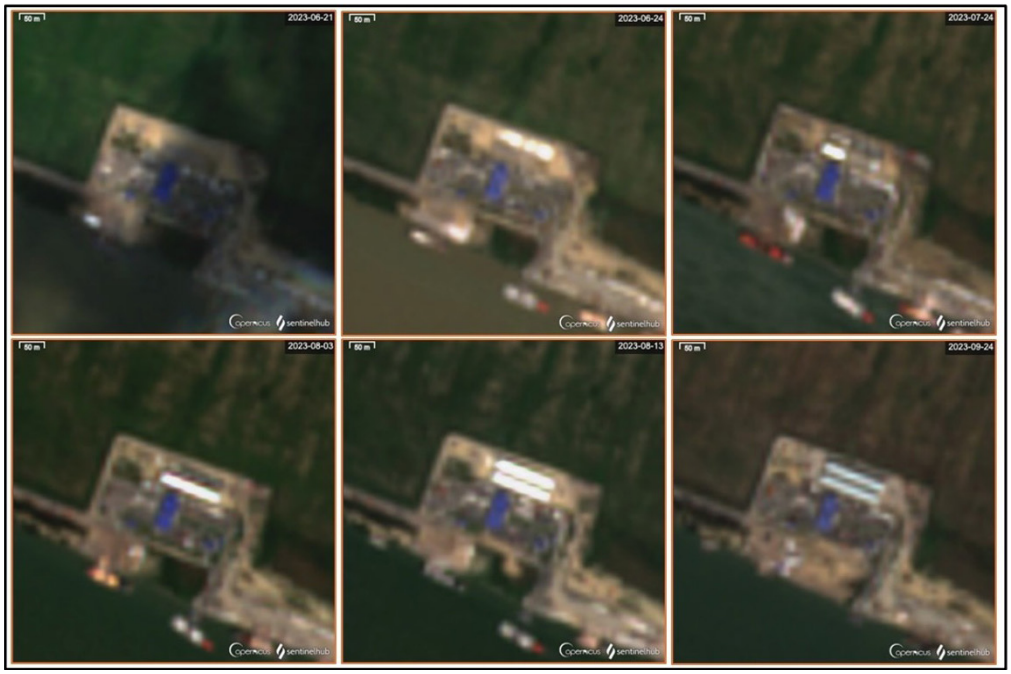

Figure 14: Satellite imagery showing the construction of two storage sheds at Orlivka between 21 June and 24 September 2023. © Copernicus Sentinel-2 Data [2023] (annotated by GRC).

The SMJT investigated two Russian attacks on grain facilities located at the Orlivka border crossing, carried out on 25 September and 6 October 2023 respectively.

Attack on 25 September 2023. On 25 September 2023 the Orlivka border crossing was reportedly targeted by Russian drones in a two-hour long attack, as announced by both the OPG and the Head of Odesa Regional Administration.[101] The attack caused damage to granaries, administrative buildings, and freight vehicles.[102] The Head of the Odesa Regional Administration specified that the attack had taken place within the Izmail district and that two people had been injured, and a border checkpoint building, storage facilities, and more than 30 trucks and cars were damaged in the attack.[103] As a result, the Odesa Regional Administration temporarily suspended passage through the Orlivka ferry checkpoint.[104]

Video footage of the attack shows tracer rounds from Ukrainian air defence attempting to shoot down a drone, which can be heard prior to the explosion.[105] According to open-source analysts consulted by GRC, the sound emitted by the drone likely suggests it is a Shahed-136.

Oil storage facilities. There are no oil storage facilities within the compound or in the vicinity of the border crossing visible on satellite imagery.

Ukrainian Armed forces. Video footage depicting Ukrainian air defence responding to the drone attack appears to confirm their presence in the vicinity of the Orlivka border crossing. The general cargo ship 'Rio' depicted below in the screenshot, was confirmed via analysis of high-resolution satellite imagery and AIS data, to be present through the attack.[106] Utilising the known length of cargo ship 'Rio' as a reference, GRC triangulated the tracer rounds to determine the approximate position of the Ukrainian air defence forces. The triangulation process approximates air defence location to **175 metres** to the left of 'Rio.'[107] Exactly to the front of Rio is a vehicle lay-by and cleared area. There is no visible vehicle disturbance in the fields within that area that the size of the weapons used would create. This potential defensive position would be largely outside the range of precision tolerances of RFAF high precision missiles and drones.

Figure 15: Screenshot from YouTube video posted by Romanian TV Digi24 (annotated by GRC) with cargo ship "Rio" and Air Defence tracer rounds attempting to shoot down drone. Triangulation reference using Rio's known length of 122 metres to determine approximate location of Ukrainian defence units. Figure 16: Satellite imagery dated 26 September 2023 (zoomed-in Version of Fig. 13) showing the area 175m to the left of Rio with no signs of vehicle disturbance in the field and a cleared track from the road to the river. © Airbus DS (2023) (annotated by GRC).

Attack on 6 October 2023. On 6 October 2023, the Head of Odesa Administration stated that Russian forces had shelled the Orlivka ferry crossing for the second time in ten days.[108] This was further confirmed by the State Border Guard Service of Ukraine, which suspended the passage temporarily.[109]

On the morning of 6 October 2023, the Defence Forces for the South of Ukraine reported a large-scale drone attack against southern Ukraine involving Shahed 131 and 136 UAVs launched from Crimea.[110] Ukrainian air defences intercepted three drones over Odesa Oblast.[111]

The attack caused damage to Danube border and port infrastructure, including a granary and several trucks.[112] Satellite imagery of Orlivka captured at 11:52hrs EEST on 5 October 2023 shows key changes from imagery form 26 September 2023. Damage to the newly built storage shelters is clearly visible, with the missing pieces collected in the north-east corner of the site.

Figure 17: Photo of burning trucks and Orlivka ferry crossing tweeted on 6 October 2023. Figure 18: Satellite image showing Orlivka. Source: Bing.

Figure 19: Satellite imagery dated 5 October 2023 showing Orlivka.
© Airbus DS (2023) (annotated by GRC).

Oil storage facilities. Satellite imagery does not reveal any oil storage facilities within the compound or in the vicinity of the border crossing.

Ukrainian Armed forces. Satellite imagery dated 5 October 2023 shows a new berm in the field approximately 160 metres from the north-east corner of the crossing, compared to imagery from 26 September 2023. Video footage of the night of the attack depicts tracer rounds of active air defence. The origin of the rounds was geolocated to approximately the same location as the berm, suggesting that this location was used by UAF for purposes of air defence.

IV. Applicable Law

This section briefly outlines a number of core international crimes that, based on the information analysed to date by the SMJT, may attach to the factual matrix included in this report.[113] Specifically, based on the conduct presented above, the SMJT has preliminarily assessed that there are reasonable grounds to believe that - in attacking grain and related infrastructure - Russian forces may have committed the war crimes of:

- Intentionally Directing Attacks against Civilian Objects (Article 8(2)(b)(ii) of the Rome Statute); and
- Destroying or Seizing the Enemy's Property not Justified by Military Necessity (Article 8(2)(b)(xiii) of the Rome Statute).

War Crimes under the Rome Statute framework

The starting point for a war crimes analysis is to establish whether an armed conflict exists. Specifically, an international armed conflict ('IAC') exists where there is a resort to armed force between States, including in the context of military occupation.[114] Perpetrators need to be aware of the factual circumstances that established the existence of the armed conflict.[115]

Additionally, the armed conflict must have played a "substantial part" on the perpetrator's ability or decision to commit the prohibited conduct or on the manner in which or purpose for which it was committed.[116]

A single act or attack may amount to a war crime.[117] Whilst the Rome Statute provides that the ICC has jurisdiction over war crimes "in particular when committed as part of a plan or policy or as part of a large-scale commission of such crimes,"[118] the existence of a plan, policy, or scale is not an element of war crimes and is therefore "not a prerequisite for the Court to exercise jurisdiction [...]."[119]

In the context of the full-scale invasion of Ukraine that commenced on 24 February 2022, including the attacks against grain and related infrastructure in ports and facilities of Odesa province, neither of the *chapeau* elements are contentious. The Russian Federation launched a military invasion into Ukraine on 24 February 2022, resulting in an IAC.[120]

The sheer number of incidents described in Section III formed part of a series of concerted attacks against Ukraine's grain and related infrastructure across the Odesa Oblast. The campaign of high-scale attacks against the ports of Chornomorsk, Reni, and Izmail, resulting in the damage and destruction of grain and grain-related infrastructure, together with the attacks carried out against the agricultural company 'Ivushka' and the Orlivka Border Crossing, a ferry terminal

primarily handling grain, were aimed at suffocating Ukraine's economy by degrading the country's grain stocks and ability to export. The scale of damage caused will have long-term reconstruction impacts, weakening Ukraine's future market value. The attacks directly followed Russia's withdrawal from the BSGI which was set up to mitigate the effects of the conflict on Ukraine's agricultural sector and exports to world markets. This demonstrates a nexus between the attacks outlined in this report and the conflict taking place in Ukraine.

Intentionally Directing Attacks against Civilian Objects

Article 8(2)(b)(ii) of the Rome Statute criminalises the war crime of "[i]ntentionally directing attacks against civilian objects, that is, objects which are not military objectives."[121] This article enshrines the IHL principle of distinction and notes that the targeting of civilian objects may never be justified by military necessity.[122]

Principle of distinction

The principle of distinction, the cornerstone of IHL, requires civilians and civilian objects be distinguished from combatants and military objectives. Attacks may only be directed against the latter.[123]

This crime requires the cumulative presence of three elements.[124] First, it needs to be established that the perpetrator directed an attack. IHL provisions define 'attacks' as "acts of violence against the adversary, whether in offence or in defence."[125] This definition applies to "any act of land, air, or sea warfare which may affect [...] civilian objects on land."[126] There is, however, no need for the attack to result in damage or destruction.[127]

Second, it must be proven that the targeted object was civilian in nature, i.e. not a military objective. Military objects are those that effectively contribute to the military action of the enemy by its nature, location, purpose, or use, meaning that there must be a proximate nexus between the object and the military action. Additionally, their destruction, capture, or neutralization must have offered a definite military advantage in the circumstances ruling at the time, as opposed to merely potential or indeterminate advantages.[128] The civilian object must have been the primary target of the attack (i.e., not an incidental target to an attack targeting military objectives).[129]

There are certain categories of civilian objects which enjoy an enhanced protection under IHL. Objects Indispensable to the Survival of Civilians ('OIS') fall under this category and include "foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works."[130] Grain and related infrastructure are typically considered OIS and therefore may only be targeted in specific circumstances.

Third, the perpetrator must have committed the crime with intent and knowledge[131] and must have intended for the civilian object(-s) to be the object of the attack.[132] This requires the perpetrator to have knowledge of the fact that the targeted objects were civilian in nature.[133] The intention of the perpetrator can be inferred from his/her conduct, the weapons or tactics used during the attack, the scale of the damage done to civilian objects, the nature of the targeted objects, the discriminatory nature of the attack, and the nature of the act constituting the attack.[134]

Preliminary considerations: the attack on the port of Chornomorsk

Following its withdrawal from the BSGI and within the span of less than four months, Russian forces launched at least nine significant kinetic attacks on grain and related infrastructure across the Odesa Oblast.[135] One such example was the attack on Chornomorsk Port on 19 July 2023. On the same day, in response to Ukrainian authorities accusing Russian forces of deliberately attacking grain infrastructure in two overnight strikes, a pro-Kremlin journalist claimed that it is "absolutely necessary to continue [these attacks]" as "[s]unflower meal and vegetable oil, of which there is a lot in the ports, burn no worse than diesel fuel."[136] Whilst this statement is not necessarily representative of the direct views of the Russian Government, the media ecosystem position is certainly relevant for the contextual understanding of the situation and reflects a generalised knowledge of the ongoing attacks and the importance of this critical infrastructure for Ukraine.

As outlined above, the attack in Chornomorsk resulted in the destruction of a junction of conveyer belts located in the central area of the port crucial for grain distribution to storage silos or to ships, alongside the damage of three large grain elevator silos, impacting 60,000 tonnes of grain and nearby rail carriages.[137] Food or food-specific infrastructure (and therefore grain and grain-related infrastructure) are typically to be considered as civilian objects due to their nature or intrinsic character.[138] A thorough investigation conducted by GRC's SMJT revealed no *indicia* of military use of the grain and related facilities at the time of the attacks, nor was there a reasonable basis to believe that they may have been intended to be used for such purposes in the future. Even though the SMJT identified oil storage facilities and at least seven locations where Ukrainian forces were posted, both in defence of the port and in-land,[139] the distance separating these potentially legitimate targets from the protected infrastructure was enough to allow Russian Forces to distinguish between them, especially considering the wide array of precise weapons available in their arsenal and more specifically the weapons used on the 19 July 2023 attack. Further, the destruction of grain meant for export would consist solely of an economic advantage, and not a military one, inhibiting its classification as a lawful military objective.

There are additionally several credible factors that may be relied upon to infer Russia's intention to attack the Ukrainian grain infrastructure, including:

1. the use of high-precision weapons, likely Onyx missiles, to launch the attack against the grain and related infrastructure in Chornomorsk and the lack of military objectives within the precision range of such weapons.[140]
2. Russian rhetoric surrounding attack.
3. The lack of information to show that military objectives in the area were also targeted.
4. The clear patterns of attacks against grain and related infrastructure across the whole Odesa Oblast are other relevant factors to consider.

Considering all these factors and on the basis of the information analysed to date by the SMJT, there are reasonable grounds to believe that, by attacking grain and grain-related infrastructure in Chornomorsk on 19 July 2023, Russian forces committed the war crime of attacking civilian objects.

Destroying or Seizing the Enemy's Property not Justified by Military Necessity

Article 8(2)(b)(xiii) of the Statute prohibits the war crime of "[d]estroying or seizing the enemy's property unless such destruction or seizure be imperatively demanded by the necessities of war."[141] Given the type of attacks considered in the present report, this section will only focus on the destruction of enemy's property.

This crime requires the cumulative presence of several elements.[142] Firstly, the perpetrator must have either partially or completely destroyed a property,[143] either public or private,[144] including by setting it on fire, or by demolishing it.[145]

The property in question must possess an "an enemy character",[146] meaning that it "must belong to individuals or entities aligned with or with allegiance to a party to the conflict adverse or hostile to the perpetrator."[147] The destroyed property must further be protected under IHL, meaning that the property itself must not be a military objective.

The destruction taking place must additionally not be justified by military necessity, an IHL concept allowing for acts that serve the most serious military reasons and that are of an imperative nature.[148] A case-by-case assessment will be necessary to determine whether the destruction of property was exceptionally justified by military necessity. The perpetrator must have finally destroyed the enemy's property with intent and knowledge[149] and they must additionally have had awareness of the factual circumstances indicating the protected status of the property in question.[150]

Preliminary considerations: the attack on the port of Reni

As outlined above, the SMJT conducted an investigation into two attacks on the port of Reni, which took place on 24 July and 16 August 2023 respectively. These attacks resulted in the extensive damage and destruction of grain and related infrastructure and rendered 9,440 square meters of grain-storage facilities useless.[151] Amongst these, were some facilities owned by Ukrainian private companies Trans-Expo and ALC Reni Elevator.[152] These facilities qualified as civilian objects and were thus protected from that destruction under IHL.

As mentioned, only the most serious military reasons of an imperative nature may justify the destruction of a protected object belonging to a hostile party. The destruction of Ukraine's grain and grain-related facilities cannot be justified under the doctrine of military necessity. The SMJT found no information which would offer reasonable grounds to believe that attacking Ukraine's grain and grain-related facilities would have a direct nexus to military action to legitimise these attacks through the prism of a war sustaining theory.

As in the case of Chornomorsk, the destruction caused to grain and grain-related infrastructure in Reni was not the result of failed targeting of military objectives in the area, mischaracterisation of civilian objects as lawful targets, or of "collateral damage" caused whilst attempting to target military objectives. Rather, the weapons used in the attacks – likely Shahed drones with demonstrated pinpoint accuracy in demolishing stationary targets[153] - and the lack of military objectives within the precision range of such weapons[154] may be relied upon to infer Russia's intention to attack and destroy the Ukrainian grain infrastructure. The fact that satellite imagery appears to not depict any damage on the military objectives present in the area in the period under consideration strengthens this conclusion.

Russian forces were likely aware of the factual circumstances that established the status of the property, as it emerges from statements released by the Russian government and government sponsored actors in relation to attacks on the grain and grain-related infrastructure. As an illustrative example, on 24 July 2023, a pro-Kremlin journalist estimated publicly that the destruction of two specialised cranes within the port of Reni would prevent exporters from unloading cargo in the port for three to four years and that missile attacks against Black Sea and Danube Ports would trigger insurance companies' refusal to insure vessels destined for Odesa, Reni, or Izmail.[155] Similarly, on 19 July 2023, another pro-Kremlin journalist stated that the only effective Russian response to Ukraine's efforts to bypass Russia in grain exports, by seeking alternative shipping routes and international support, would simply be "the destruction of the port infrastructure of Ukraine, so that nothing could enter there, nothing could leave from there."[156]

Considering all the factors outlined above, there are reasonable grounds to believe that Russian forces committed the war crime of destroying the enemy's property not justified by military necessity.

V. Cracking the code: using cutting-edge technology to identify the owner of a mobile device and link them to Russia's Shahed drone attacks

Following the identification of possible launch sites for Shahed drone attacks, a group of specialist analysts employed by the SMJT examined mobile device data at these sites in the timeframe spanning between 1 January and 31 October 2023. Specifically, the analysts looked at the key launch sites of Balaklava, Cape Chauda, Kursk, Primorsko-Akhtarsk, Seshcha, and Yeysk. Data at these sites was compared to data emitting from the Yelabuga Economic Zone ('YEZ'), widely reported as being Russia's main Shahed drone supply and assembly plant.

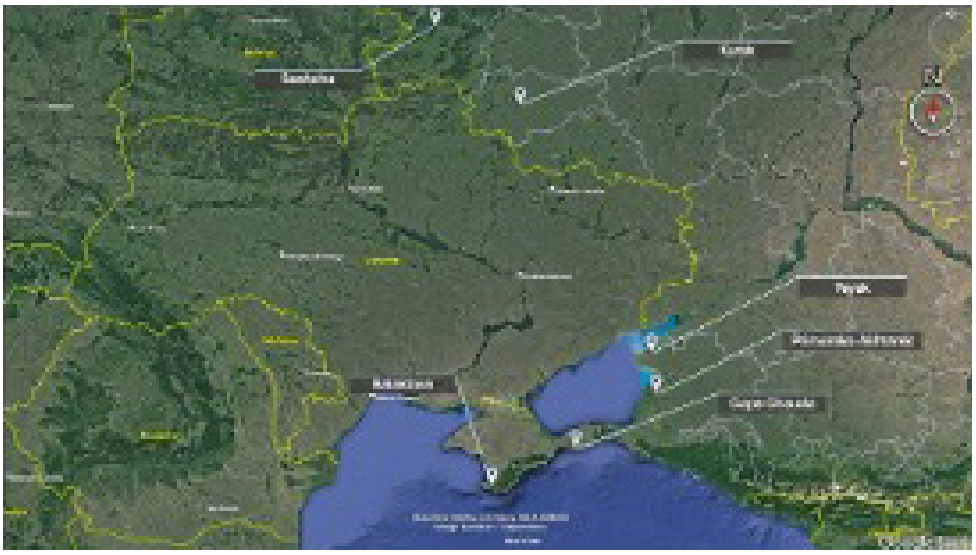

Figure 20: Reported Russian Launch Sites for Shahed UAVs.

The initial investigation revealed mobile data linking launch sites to Shahed drone supply chain activity around the dates when Shahed drone attacks on Ukrainian civilian infrastructure were widely reported upon.

Device A. Amidst the mobile device data analysed, one specific device stood out for its strong association with YEZ, as well as the launch sites of Primorsko-Akhtarsk, Seshcha, and Yeysk Airfield. Specifically, this device (hereinafter 'Device A'), was observed at YEZ on multiple occasions between in 2023, showing a digital signature that indicated the device's owner was highly likely part of the Shahed supply chain.

Further evidence of Device A's association to Shahed supply chain was its observed presence within two buildings inside the Yeysk Military Zone on several occasions in July 2023. These same buildings were subsequently targeted by Ukrainian forces on 21 June 2024, as they were identified as facilities associated with the storage and operation of Shahed-136 drones.

Figure 21: Satellite image dated 22 June 2024 showing damaged Yeysk Shahed facility. © Planet Labs PBC.

A number of Shahed-related attacks were carried out by Russia against Ukraine during the period under consideration, some of which were closely correlated in time to the Device A's presence at the launch sites, as shown below.

Table 1 - correlation between Device A's presence at launch sites and the attacks on Ukrainian civilian infrastructure

Device A's presence at suspected launch sites		**Reported corresponding Shahed attacks on grain/ports/ civilian infrastructure**
25 May 2023	Seshcha Airfield	26 May: Shahed attacks against the Kharkiv region and Kyiv. 29 May: Shahed shot down over Odesa Port, causing a fire.
6 June 2023	Primorsko-Akhtarsk Airfield Seshcha Airfield	10 June: Shahed drone shot down over the Odesa region.
20-21 June 2023	Yeysk	22 June: Storage unit in Odesa destroyed by a Shahed drone.
21 June 2023	Primorsko-Akhtarsk Airfield	
3-12 July 2023	**Yeysk**	3 July: Shahed attack on Sumy 8 July: Dnipro and Kirovograd region 11 July: Odesa Port 12 July: Cherkasy region 14 July: Kryvyi Rig
16-22 July 2023	**Yeysk**	18 and 19 July: intense drone attacks against Odesa and its ports. 19 July: Chornomorsk Port facility, the Zhytomyr region, and Kherson. 20 July: Chernihiv region.

The correlation outlined above suggests that it is likely the owner or Device A facilitated at least some of these Shahed attacks.

Identification of the owner of Device A. The analysts found a residential address in Yelabuga town (close to the YEZ Shahed assembly site), which they suspected to be the residential address of the owner of Device A. Further investigation of this address uncovered key details about the person of interest, ultimately corroborating the previously made assessment that he was highly likely involved in the Shahed supply chain.

This process entailed the acquisition and analysis of terabytes of deep web and general open-source data, mostly filtering and selecting content with a .ru top-level domain or pertaining to Russian accounts. Components of the residential address were searched against this scraped data. Several thousand lines returned full or partial matches to the address. Each line was individually vetted to ensure the content referred to the correct location identified by the device data pattern of life. Only a single record passed this vetting, providing a First Middle Last, DOB, tax ID number, and phone number of an individual at that address.

These details were then searched across large global search engines, social media and breached data sources, leading to the discovery of additional data associated with the person of interest, including his VK profile, additional phone numbers, email addresses, and passport numbers.

Further investigation, including through the use of facial recognition software, revealed that the owner of the device had attempted to obfuscate his involvement in the supply chain by using his wife's name on his corporate records.

VI. Conclusions

The targeting of Ukraine's agricultural infrastructure by Russian forces constitutes a clear pattern of economic warfare with severe humanitarian and global implications. As this report and GRC's previous report, *Agriculture Weaponised,* demonstrate, these attacks were not incidental but part of a broader strategy to dismantle Ukraine's agricultural and export capacity—through the unlawful occupation of territory and appropriation of Ukrainian grain, the de facto blockade of ports from February to June 2022, and the well-documented patterns of attacks against grain and related infrastructure. Public statements by Russian officials and government-sponsored actors further underscore the intent behind these operations.

The preliminary findings presented in this report reveal the scale and coordination of this campaign. Russian forces employed a range of high-precision weapons to repeatedly strike grain and related infrastructure, with attacks escalating sharply following Russia's withdrawal from the BSGI in July 2023. The information collected and analysed by the SMJT shows widespread damage across the Odesa Oblast, with over 101,000 square metres of grain storage destroyed, machinery rendered inoperable, and repeated strikes on both inland and port facilities. Most of these attacks were carried out in the absence of military objectives in the immediate vicinity and, in several cases, appear to have been launched with expensive, high-precision weapons, suggesting the involvement of strategic-level decision-making within the Russian Armed Forces.

The consequences of this strategy are far-reaching. Beyond the immediate damage to Ukraine's economy and civilian livelihoods, these actions have exacerbated global food insecurity, particularly in regions heavily reliant on Ukrainian grain.

Given the scale and impact of these attacks, international and national investigations must prioritise the targeting of agricultural infrastructure as a potential war crime. Prosecutorial bodies, including the International Criminal Court and domestic war crimes units, should ensure these incidents are fully examined and that those responsible are held to account. The protection of critical civilian infrastructure and food systems in conflict zones is not only a legal obligation—it is essential to safeguarding civilian populations and global food security.

ENDNOTES

[1] This included an advanced upstream social media, news, and mainstream media search, along with official Russian and Ukrainian governmental sources. OSINT analysts individually reviewed over 353 mainstream and social media sources featured in this report, with hundreds more reviewed and discounted based on relevance or reliability.

[2] Telegram, Post of Skabeeva (2 August 2023).

[3] Telegram, Post of Soloviev (21 July 2023).

[4] Official Internet Resources of the President of Russia, 'Plenary session of the Russia-Africa Economic and Humanitarian Forum' (27 July 2023).

[5] Reuters, 'Ukraine says Russian strike on Odesa port is attack on global food security' (12 March 2025).

[6] D. Basmat, The Kyiv Independent, 'Russia damaged over 300 port facilities, 20 foreign vessels in the past year, Zelensky says' (23 November 2024).

[7] Global Rights Compliance, 'Agriculture Weaponised. The Illegal Seizure and Extraction of Ukrainian Grain by Russia' (November 2023).

[8] Council of the European Union, 'Ukrainian Grain Exports Explained' (22 January 2024).

[9] This included an advanced upstream social media, news, and mainstream media search, along with official Russian and Ukrainian governmental sources. OSINT analysts individually reviewed over 353 mainstream and social media sources featured in this report, with hundreds more reviewed and discounted based on relevance or reliability.

[10] The GRC SMJT OSINT Methodology can be provided upon request.

[11] Rome Statute, Art. 58(1).

[12] Telegram, Post of Soloviev (24 July 2023).

[13] Telegram, Post of Mardan (20 July 2023).

[14] S&P Global, 'Research Update: Ukraine Foreign Currency Ratings Raised To 'CCC+' From 'SD' On Completed Debt Restructuring; Outlook Stable' (19 August 2022), "*We estimate Ukraine's real GDP will contract by 40% in 2022 on the back of collapsing exports, consumption, and investment*."

[15] Sergey Klyuchenkov operates and publishes under the pseudonym 'Sergey Mardan.' On 1 July 2023, the Security Service of Ukraine issued a Notice of Suspicion against Klyuchenkov for violations of Articles 109, 436-2, and 442 of the Ukrainian Criminal Code, respectively criminalising public calls for violent change or overthrow of the constitutional order or for the seizure of state power, as well as distribution of materials calling for such actions; the justification, recognition as legitimate, denial of the armed aggression of the Russian Federation against Ukraine and the production and distribution of such materials using mass media; and public calls for genocide, as well as the production of materials with calls for genocide for the purpose of distribution or distribution of such materials. See Telegram, Post of Служба безпеки України (1 July 2023).

[16] Telegram, Post of Mardan (20 August 2022).

[17] Telegram, Post of Soloviev (21 July 2023).

[18] Telegram, Post of Soloviev (21 July 2023); Telegram, Post of Mardan (21 July 2023).

[19] Telegram, Post of Soloviev (19 July 2023).

[20] M. Santora, N. MacFarquhar, H. Willis, New York Times, 'Explosions Damage Crimea Bridge as Russia Blames Ukraine for Attack' (17 July 2023).

[21] Ministry for Communities and Territories Development of Ukraine, 'Russia Continues To Cause Global Terror Even After Withdrawing From The Grain Initiative' (19 July 2023).

[22] United Nations, 'Black Sea Grain Initiative Joint Coordination Centre'.

[23] GPS coordinates: 46.325510, 30.654311.

[24] *See* Logistics Cluster, 'Ukraine - 2.1.2 Port of Ilichevsk (Chornomorsk)'.

[25] *See* Chornomorsk Fishing Port – Container Terminal.

[26] *See* Logistics Cluster, 'Ukraine - 2.1.2 Port of Ilichevsk (Chornomorsk).'

[27] Facebook, Post of Odesa Regional State Administration (19 July 2023).

[28] Telegram, Post of Monitoringwar (19 July 2023).

[29] Telegram, Post of Air Force of the Armed Forces of Ukraine (19 July 2023).

[30] Telegram, Post of Chornomorsk city (19 July 2023); Telegram, Post of Chornomorsk city (19 July 2023); Telegram, Post of Chornomorsk city (19 July 2023).

[31] The message was posted at 2:18hrs EEST. *See* Telegram, Post of Chernomorsk Board (19 July 2023).

[32] A. Zharikova, Pravda, 'Росіяни знищили 60 тисяч тонн зерна в порту Чорноморська' (19 July 2023).

[33] Kernel is the largest producer and exporter of grains in Ukraine, the leader of the world sunflower oil market, and a major supplier of agricultural products from the Black Sea region to international markets. It delivers its products to over 60 countries. *See* Kernel.ua.

[34] Viterra Limited is a Canadian grain handling business. It is registered in Ukraine as an enterprise with foreign investments (an enterprise (organization) of any legal form established in accordance with the laws of Ukraine, with a foreign investment in the authorized capital of which, if any, is not less than 10 percent). See YouControl, Viterra.

[35] CMA CGM Group ("Compagnie maritime d'affrètement — Compagnie générale maritime") is a French shipowner specialising in container ships. It is registered in Ukraine as a subsidiary of SMA CGM Ukraine, a company whose sole founder and owner is another company, including a foreign company. *See* Eurofiscalis, CMA-CGM définition: Compagnie maritime d'affrètement — Compagnie générale maritime. *See also* YouControl, CMA CGM Group.

[36] Ministry for Communities and Territories Development of Ukraine, 'Russia Continues To Cause Global Terror Even After Withdrawing From The Grain Initiative' (19 July 2023); Reuters, 'Russian attack damages Chornomorsk port grain infrastructure, destroys grain – Kyiv' (19 July 2023); Reuters, 'Ukraine accuses Russia of deliberately striking Odesa port, grain terminals' (19 July 2023); Intent, 'Food Terror: A Chronicle of Attacks on Grain Port Infrastructure in Odesa Oblast' (25 August 2023).

[37] X, Post of kernel.ukraine (19 July 2023); Viterra, Port Terminals – IGT (last accessed 31 December 2024).

[38] CMA CGM, Ukraine - Local Charges, Effective As Of 1 July 2024 (last accessed 31 December 2024).

[39] X, Post of kernel.ukraine (19 July 2023).

[40] X, Post of kernel.ukraine (19 July 2023); D. Krasnolutska, Bloomberg, 'Ukraine's Kernel May Need a Year to Fix Chornomorsk Port After Russian Attack' (20 July 2023); Reuters, 'Russian attack damages Chornomorsk port grain infrastructure, destroys grain – Kyiv' (19 July 2023).

[41] Tripoli, 'Селянське (Фермерське) Господарство "Ивушка"' (last accessed 17 October 2024).

[42] H. Arhirova, The Seattle Times, 'Russian missile attacks leave few options for Ukrainian farmers looking to export grain' (29 July 2023).

[43] O Robeyko, UNIAN, 'Росія вдарила ракетами "Калібр" по терміналах із зерном в Одеській області (фоторепортаж)' (21 July 2023).

[44] Comments.UA, '120 тонн знищеного зерна: опубліковані нові фото наслідків обстрілу Одещини Источник' (22 April 2023); U.S. Embassy in Georgia, 'Ukraine's Neighbors Offer Routes For Grain Exports' (5 September 2023).

[45] O. Robeyko, UNIAN, 'Росія вдарила ракетами "Калібр" по терміналах із зерном в Одеській області (фоторепортаж)' (21 July 2023).

[46] T. Zabozhko, Fakty, 'РФ за дві хвилі ударів Калібрами знищила 100 т гороху та 20 т ячменю на Одещині' (21 July 2023).

[47] *See* NASA FIRMS.

[48] Telegram, Post of Air Force of the Armed Forces of Ukraine (21 July 2023). According to the Head of the Joint Coordination Press Centre of the Southern Defence Forces, Nataliya Humenyuk, the impact of the first wave of the attack on Ivushka coincided with the air alert. In this sense, *see* T. Zabozhko, Fakty, 'РФ за дві хвилі ударів Калібрами знищила 100 т гороху та 20 т ячменю на Одещині' (21 July 2023).

[49] Telegram, Post by Олег Кіпер/Одеська ОДА (ОВА) (22 July 2023).

[50] T. Zabozhko, Fakty, 'РФ за дві хвилі ударів Калібрами знищила 100 т гороху та 20 т ячменю на Одещині' (21 July 2023); ArmyInform, 'Сьогодні було випущено сім ракет різного класу по об'єкту інфраструктури в Білгород-Дністровському районі Одещини — Наталія Гуменюк' (21 July 2023).

[51] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (21 July 2023).

[52] *See* Getty Images.

[53] Міністерство Оборони України Генеральний Штаб Збройних Сил України Центр Досліджень Воєнної Історії Збройних Сил України, 'Зброя Російсько-Української Війни 2022-2023 Років' (2023), p. 144.

[54] This refers to general elevator capacity, with 26.95 million tonnes representing the largest possible operational capacity to store grain.

[55] The International Commission for the Protection of the Danube River (ICPDR), 'UKRAINE' (2024).

[56] R. Bandura, I. Timtchenko, B. Robb, Center for Strategic and International Studies, 'Ships, Trains, and Trucks: Unlocking Ukraine's Vital Trade Potential' (8 April 2024).

[57] R. Bandura, I. Timtchenko, B. Robb, Center for Strategic and International Studies, 'Ships, Trains, and Trucks: Unlocking Ukraine's Vital Trade Potential' (8 April 2024).

[58] I. Pylypov, Pravda, 'Українські порти на Дунаї подвоїли обробку вантажів за 10 місяців 2023 року' (19 November 2023).

[59] I. Pylypov, Pravda, 'Українські порти на Дунаї подвоїли обробку вантажів за 10 місяців 2023 року' (19 November 2023).

[60] Telegram, Post of MoD Russia (30 April 2022); Telegram, Post of RIA Novosti (18 May 2022).

[61] Telegram, Post of Mardan (24 July 2023).

[62] Telegram, Post of Mardan (24 July 2023).

[63] Telegram, Post of Skabeeva (24 July 2023).

[64] Ministry of infrastructure of Ukraine, State Enterprise 'Ukrainian Sea Ports Authority', 'Study on the activity on the Danube ports in 2018'(2019), p. 14.

[65] Ministry of infrastructure of Ukraine, State Enterprise 'Ukrainian Sea Ports Authority', 'Study on the activity on the Danube ports in 2018' (2019), p. 14.

[66] Ministry of infrastructure of Ukraine, State Enterprise 'Ukrainian Sea Ports Authority', 'Study on the activity on the Danube ports in 2018' (2019), p. 13.

[67] Ministry of infrastructure of Ukraine, State Enterprise 'Ukrainian Sea Ports Authority', 'Study on the activity on the Danube ports in 2018' (2019), pp. 15-16.

[68] Danube Commission, 'Factsheet Port of Reni' (2022) p. 3.

[69] Danube Commission, 'Factsheet Port of Reni' (2022) p. 3.

[70] Trans-Oil, 'Trans-Oil Group On The Attack On The Danube Storages And Ports Press Release' (25 July 2023). *See* Submission, para. 134.

[71] YouTube, Batumelembi, 'ბათუმელი მეზღვაურები ოდესის პორტში დაბომბვაში მოჰყვნენ - ისინი დახმარებას ითხოვენ' (24 July 2023).

[72] *See* InfoRegister, Dandiship Oü. As of April 2024, the ship was renamed as Gemini Capo, owned by Twins Shipping Ltd in Turkey - Marine Traffic, Gemini Capo; Ship Spotting, Akomena. As of April 2024, the ship was renamed as Gemini Capo, owned by Twins Shipping Ltd in Turkey.

[73] Batumelembi, 'ბათუმელი_მეზღვაურები_ოდესის_პორტში_დაბომბვაში_მოჰყვნენ_-_ისინი_დახმარებას_ითხოვენ' (24 July 2023).

[74] X, Post of AGRIColumn (24 July 2023).

[75] Interfax Ukraine, 'Three warehouses with grain destroyed in port of Reni in attack by drones – media' (24 July 2023); P. Beaumont, The Guardian, 'Trying to make the world starve": Russian drones destroy grain warehouses at Ukraine ports' (24 July 2023); X, Post of Kruku (24 July 2023); RBC-Ukraine, 'Drones hit grain in Reni: crucial about attack on Romania border port' (24 July 2023).

[76] X, Post of SprinterFamily (24 July 2023); X, Post of Lukyluke31 (24 July 2023).

[77] YouControl, ALC Reni.

[78] X, Post of What the Media Hides (16 August 2023).

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[80] *See* 'State Enteprise "IZM MTP" Izmail Commercial Sea Port'.

[81] *See* Region Grain Company, 'Izmail Grain Elevator' (2020).

[82] Ministry of infrastructure of Ukraine State enterprise 'Ukrainian sea ports authority', 'Study on the activity on the Danube ports in 2018' (2019), pp. 4-7.

[83] United Nations Conference on Trade and Development, 'Review of Maritime Transport, Navigating stormy waters' (2022), p. 103.

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[85] X, Post of Defense of Ukraine (2 August 2023); Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (2 August 2023).

[86] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (2 August 2023).

[87] Telegram, Post of Skabeeva (2 August 2023).

[88] Facebook, Post of Oleksandr Kubrakov (2 August 2023).

[89] Ministry of Defense of Ukraine, 'Situation Update Of General Staff Of UAF Regarding Russian Invasion As Of 6 P.M., August 23, 2023' (23 August 2023).

[90] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (23 August 2023).

[91] Telegram, Post of Colonelcassad (23 August 2023).

[92] Facebook, Post of Oleksandr Kubrakov (23 August 2023).

[93] Voice of America News, 'Ukraine Says Russia Hit Port Infrastructure in Odesa Attack' (23 August 2023).

[94] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (12 October 2023); V Melkozerova, Politico, 'Russia Attacks Ukraine's Danube Ports With Drones' (12 October 2023).

[95] Telegram, Post of Повітряні Сили ЗС України / Air Force of the Armed Forces of Ukraine (12 October 2023); Radio Free Europe - Radio Liberty, 'Russian Drones Damage Danube Port Facilities Amid Intense Fighting In Donetsk Region' (12 October 2023).

[96] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (12 October 2023).

[97] Danube Commission, Factsheet Port of Izmail (7 July 2022), p. 2. According to the International Maritime Organization (IMO), liquid bulk cargo refers to any cargo carried in closed tanks and poured or pumped into the carrying vessel. This category includes a wide range of liquids, from edible liquids (vegetable oil, cooking oil, fruit juices, milk, edible oils); non-edible, non-hazardous liquids (lubricants, adhesives, liquid fertilizers, zinc ash); hazardous liquids (petroleum, liquefied natural gas, liquefied petroleum gas, gasoline, dangerous chemicals, sulphuric acid); and non-hazardous, non-edible liquids (glycerine, aqueous dyes). *See* Marlinblue, Liquid Bulk Cargo (Types, Maritime Transportation, and Claims).

[98] *See* Yandex Maps.

[99] Centre for Transport Strategies, 'The war forced us to speed up: How the Orlivka-Isakcha ferry crossing is turning into a port on the Danube' (23 March 2023).

[100] Centre for Transport Strategies, 'The war forced us to speed up: How the Orlivka-Isakcha ferry crossing is turning into a port on the Danube' (23 March 2023).

[101] Telegram, Post of Офіс Генерального прокурора (26 September 2023); Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (26 September 2023).

[102] Telegram, Post of Офіс Генерального прокурора (26 September 2023).

[103] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (26 September 2023).

[104] Telegram, Post of Олег Кіпер/Одеська ОДА (ОВА) (26 September 2023).

[105] Youtube, Post of Digi24HD, Rușii Au Atacat Cu Drone Kamikaze Lângă Isaccea (26 September 2023).

[106] Youtube, Post of Digi24HD, Rușii Au Atacat Cu Drone Kamikaze Lângă Isaccea (26 September 2023).

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[111] Telegram, Post of Сили оборони Півдня України (6 October 2023).

[112] Telegram, Post of Сили оборони Півдня України (6 October 2023); X, Post of Blinzka (6 October 2023).

[113] This section focuses on crimes of potential relevance under the framework of International Criminal Law and, more specifically, under the framework of the Rome Statute of the International Criminal Court. Ukraine deposited its instrument to ratify the Rome Statute in October 2024, which officially entered into force on 1 January 2025. This means that when the alleged crimes were committed (July – October 2023), Ukraine was not a State Party to the Rome Statute. However, under Article 12(3) of the Rome Statute, a non-member state can accept the jurisdiction of the ICC on an ad hoc basis. The Government of Ukraine made two Article 12(3) declarations in 2014 and 2015 respectively, allowing the ICC to exercise jurisdiction over Rome Statute crimes committed on the territory of Ukraine from 21 November 2013 onwards.

[114] Rome Statute, Elements of Crimes, Art. 8(2)(a)(i), fn. 34.

[115] Rome Statute, Elements of Crimes, Art. 8 (introduction). *See* also Prosecutor v. Ntaganda, ICC-01/04-02/06, Judgement, 8 July 2019 ('Ntaganda Trial Judgement'), para. 733; Prosecutor v. Jean-Pierre Bemba Gombo, ICC-01/05-01/08, Judgment pursuant to Article 74 of the Statute, 21 March 2016 ('Bemba Trial Judgement'), para. 145.

[116] Prosecutor v. Dragoljub Kunarac, Radomir Kovac and Zoran Vukovic, IT-96-23/A & 23/1-A, Judgement, 12 June 2002 ('Kunarac, Kovac and Vukovic Appeal Judgement'), para. 58.

[117] Prosecutor v. Callixte Mbarushimana, ICC-01/04-01/10, Decision on the Confirmation of Charges, 16 December 2011 ('Mbarushimana Confirmation of Charges'), para. 94.

[118] Rome Statute, Art. 8(1).

[119] Prosecutor v. Jean-Pierre Bemba Gombo, ICC-01/05-01/08, Decision on the Confirmation of Charges, 15 June 2009 ('Bemba Confirmation of Charges'), para. 211. *See also* Mbarushimana Confirmation of Charges, para. 94.

[120] Geneva Academy of International Humanitarian Law and Human Rights, Rule of Law in Armed Conflict project, 'International armed conflict in Ukraine' (last updated 7 June 2023).

[121] Rome Statute, Art. 8(2)(b)(ii).

[122] Prosecutor v. Ante Gotovina, Ivan Cermak and Mladen Markac, IT-06-90-T, Judgment – Volume II of II, 15 April 2011 ('Gotovina et al Trial Judgement'), para. 1766. Given that the ICC has also dismissed the justification of military necessity in the context of attacks on civilians, it is likely that it will follow the same approach with regards to civilian objects.

[123] AP I, Arts 48, 51(2), and 52(2); AP II, Art. 13(2); Customary IHL: Rules, Rules 1 and 7.

[124] Rome Statute, Elements of Crimes, Art. 8(2)(b)(ii).

[125] Prosecutor v. Germain Katanga & Mathieu Ngudjolo Chui, ICC-01/04-01/07, Decision on the Confirmation of Charges, 16 December 2011, ('Katanga & Chui Decision on the confirmation of charges'), para. 266, referring to AP I, Art. 49(1) and AP II, Art. 13; ICRC, Commentary to AP I, Art. 49, para. 1880; M. Bothe, K. J Partsch, and W. A Solf, 'New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949' (2nd ed., Martinus Nijhoff, 2013), p. 328. *See also* ICC-OTP, 'Situation on Registered Vessels of Comoros, Greece and Cambodia, Article 53(1) Report', 6 November 2014, para. 93: in its report on the Situation on Registered Vessels of Comoros, Greece and Cambodia, the Office of the Prosecutor found that an "attack includes all acts of violence against an adversary."

[126] ICRC, Commentary to AP I, Art. 49, para. 1880.

[127] *See* Lexsitus, Commentary on the Law of the International Criminal Court, Art. Article 8(2)(b)(ii); Prosecutor v. Dario Kordić and Mario Čerkez, IT-95-14/2-A, Judgement, 17 December 2004 ('Kordić and Čerkez Appeal Judgement'), paras 59-62.

[128] In this sense, *see* ICRC Commentary to AP I, Art. 52; UK Ministry of Defence, The Manual, No. 5.4.4; Sassòli, in: Wippman and Evangelista (eds.), 'New Wars, New Laws?' (2005), p. 186; W. A. Solf, in: Bothe et al (eds.), 'Commentary, Article 52, 325 et seq.'; Solf W.A., 'Protection of Civilians against the Effects of Hostilities under Customary International Law and under Protocol I' 1(1), American University International Law Review (1986), p. 128; Werle and Jessberger, Principles (2014) 487. Note that the distinction between civilian objects and military objectives is not always clear cut in practice, due to the existence of dual-use objects, i.e. objects that can be used both by civilians and the armed forces alike. However, as clarified by the ICC, in case of doubt an object that is "normally dedicated to civilian purposes" must be considered civilian. In this sense, *see* Prosecutor v. Bahar Idriss Abu Garda, ICC-02/05-02/09, Decision on confirmation of charges, 8 February 2010 ('Abu Garda Decision on the confirmation of charges'), fn. 131, referring to Prosecutor v Stanislav Galić, IT-98-29-T, Judgement, 5 December 2003, ('Galić Trial Judgement'), para. 51: "[i]n case of doubt as to whether an object which is normally dedicated to civilian purposes is being used to make an effective contribution to military action, it shall be presumed not to be so used. The Trial Chamber understands that such an object shall not be attacked when it is not reasonable to believe, in the circumstances of the person contemplating the attack, including the information available to the latter, that the object is being used to make an effective contribution to military action." *See* also AP I, Art. 52(3).

[129] Prosecutor v. Germain Katanga, ICC-01/04-01/07, Judgement, 7 March 2014 ('Katanga Trial Judgement'), para. 802.

[130] Additional Protocol I, Art. 54(2). In Resolution 2417 (2018), the Security Council specified the need to spare civilian objects necessary for food production and distribution such as farms, markets, water systems, mills, food processing and storage sites, and hubs and means for food transportation'. The words "such as" in both Article 54(2) and Resolution 2417 demonstrate that the listing of OIS in AP I, Article 54(2) is not exhaustive.

[131] Rome Statute, Elements of Crimes, General Introduction, para. 2.

[132] Rome Statute, Elements of Crimes, Art. 8(2)(b)(ii).

[133] Prosecutor v Tihomir Blaškić, IT-95-14-T, Judgment, 3 March 2022 ('Blaškić Trial Judgment'), para. 180.

[134] See mutatis mutandis Katanga Trial Judgment, paras 806-807.

[135] Port of Chornomorsk, 19 July 2023; Ivushka Agricultural Company, two waves of attacks on 21 July 2023; Port of Reni, 24 July and 16 August 2023; Port of Izmail, 2 and 23 August and 11 October 2023; and Orlivka ferry crossing, 25 September and 6 October 2023.

[136] Telegram, Post of Mardan (19 July 2023).

[137] *See* Report, Section III, Sub-section on Chornomorsk.

[138] *See* AP I, Art. 52(3) (on the presumption); Art. 54(3)(b) (using the "direct" qualifier).

[139] *See* Report, Section III, Sub-section on Chornomorsk.

[140] *See* Report, Section III, Sub-section on Chornomorsk.

[141] Rome Statute, Art. 8(2)(b)(xiii).

[142] Rome Statute, Elements of Crimes, Art. 8(2)(b)(xiii).

[143] In this sense, see Katanga Trial Judgment, para. 891.

[144] Katanga Trial Judgment, para. 892; Mbarushimana Confirmation of Charges, para. 171. *See also* Kai Ambos (2nd ed.), 'Treaties on International Criminal Law – Volume II: The Crimes and Sentencing', Oxford University Press, 2022, p. 204 n. 641; Robin Geiß and Andreas Zimmermann, 'Article 8, War Crimes, Grave Breaches, para. 2(b)(xiii): Prohibited destruction', in Kai Ambos, 'Rome Statute of the International Criminal Court, Article-by-Article Commentary', Fourth Edition, Beck/Hart/Nomos, Munich/Oxford/Baden-Baden, 2022, paras. 494–496, p. 498.

[145] Katanga Trial Judgment, para. 891; *see* also Mbarushimana Confirmation of Charges, para. 174, according to which some examples of this crime could be, for instance "burning of houses", or "setting ablaze, demolishing or otherwise damaging property".

[146] O. Triffterer and K. Ambos (eds.), 'The Rome Statute of the International Criminal Court: A Commentary', Third Edition, C.H. Beck/Hart/Nomos, München/Oxford/Baden-Baden, 2016, p. 441, para. 503.

[147] Katanga Trial Judgment, para. 892.

[148] O. Triffterer and K. Ambos (eds.), 'The Rome Statute of the International Criminal Court: A Commentary', Third Edition, C.H. Beck/Hart/Nomos, München/Oxford/Baden-Baden, 2016, p. 443, para. 509. See also *Katanga*, Trial Judgment, para. 894. A comparison needs to be made between Article 8(2)(b)(xiii), which considers that the destruction of certain civilian objects could be justified on the basis of military necessity, and Article 8(2)(b)(ii), which does not admit such justification when attacking civilian objects. The rationale behind this difference lies in the fact that Article 8(2)(b)(xiii), by foreseeing the military necessity justification, tends to extend the range of legitimate targets beyond the parameters of what is usually covered under the military objectives umbrella, thus "stretching" the boundaries of the principle of distinction. It follows that the destruction of certain civilian objects could be justified based on military necessity under this article. On the other hand, Article 8(2)(b)(ii), by strictly embodying the core of the principle of distinction, thus prohibiting attacks against civilian objects, that is, objects which are not military objectives, does not allow any sort of military necessity justification when conducting attacks against such objects.

[149] Rome Statute, Elements of Crimes, General Introduction, para. 2.

[150] Katanga & Chui Decision on the confirmation of charges, para. 316.

[151] *See* Report, Section III, Sub-section on Reni.

[152] *See* Report, Section III, Sub-section on Reni.

[153] *See* Report, Section III, Sub-section on Reni.

[154] *See* Report, Section III, Sub-section on Reni.

[155] Telegram, Post of Mardan (24 July 2023).

[156] Crimean Human Rights Group, 'Statement of Kots Aleksandr Igorevich' (19 July 2023).