



Risky Returns

Nuclear weapon producers
and their financiers



ICAN
International Campaign to
Abolish Nuclear Weapons

Utrecht, December 2022

There remains a marked lack of official information available in the public domain about the use, production, transfer and stockpiling of nuclear weapons. We strived to achieve the highest level of accuracy in reporting. The information in this report reflects official information available in the public domain. We welcome comments, clarifications, and corrections from governments, companies, financial institutions and others, in the spirit of dialogue, and in the common search for accurate and reliable information on this important subject. If you believe you have found an inaccuracy in our report, or if you can provide additional information, please contact: nukes@paxforpeace.nl.

Principal Author: Alejandra Muñoz

Contributing authors:

Susi Snyder (ICAN)
Cor Oudes (PAX, the Netherlands)

Primary researchers:

Alejandra Muñoz (PAX, the Netherlands)
Jeroen Walstra (Profundo, the Netherlands)

Our thanks:

Joseph Rowntree Charitable Trust, Jubitz Family Foundation, Frank Slijper, Beatrice Fihn, Venessa Hanson, Lucero Oyarzún, Grethe Østern and Harriët Meiborg.

And all those who work tirelessly to stigmatize, outlaw, and eliminate nuclear weapons.

Notes:

Certain figures in this report may not tally exactly due to rounding. All figures are presented in United States Dollars (USD) (unless otherwise indicated). Commas (,) are used as thousands separators.

This document, as well as any data and any map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

About PAX

PAX means peace. Together with people in conflict areas and concerned citizens worldwide, PAX works to build just and peaceful societies across the globe. PAX brings together people who have the courage to stand for peace. Everyone who believes in peace can contribute. We believe that all these steps, whether small or large, truly matter and will contribute to a just and peaceful world. PAX is an ICAN partner. More information about PAX can be found at: www.paxforpeace.nl.

About ICAN

ICAN is a global campaign coalition promoting adherence to and implementation of the United Nations Treaty on the Prohibition of Nuclear Weapons. ICAN is comprised of more than 650 partner organisations in over 100 countries. More information about ICAN can be found at: www.ICANw.org.

About Profundo

Profundo is an economic research consultancy analysing commodity chains, financial institutions and corporate social responsibility issues. It works predominantly for environmental, human rights and development organisations in the Netherlands and abroad. www.profundo.nl.

© Don't Bank on the Bomb

Permission is granted for non-commercial reproduction, copying, distribution, and transmission of this publication or parts thereof so long as full credit is given to the coordinating project organization, editor, and relevant authors; the text is not altered, transformed, or built upon; and for any reuse or distribution, these terms are made clear to others.

Cover image: Avinsah Kumar on Unsplash (<https://unsplash.com/>)

Contents

Key findings	4
Introduction	6
24 Nuclear weapon producing companies	12
Changes from previous reports	13
Watchlist	13
Joint ventures	16
Submarines	17
Full company profiles	19
1. Aerojet Rocketdyne Holdings, Inc (United States)	20
2. Airbus Group (The Netherlands)	22
3. BAE Systems plc (United Kingdom)	24
4. Bechtel (United States)	26
5. Bharat Dynamics Limited (India)	27
6. Boeing (United States)	28
7. China Aerospace Science and Technology (CASC)	31
8. Constructions Industrielles de la Méditerranée (CNIM) (France)	32
9. Fluor (United States)	33
10. General Dynamics (United States)	35
11. Honeywell International (United States)	37
12. Huntington Ingalls Industries (United States)	40
13. Jacobs Engineering (United States)	43
14. L3 Harris Technologies (United States)	45
15. Leidos (United States)	47
16. Leonardo (Italy)	49
17. Lockheed Martin (United States)	51
18. Northrop Grumman (United States)	53
19. Raytheon Technologies Corporation (United States)	56
20. Rostec (Russian Federation)	58
21. Safran (France)	59
22. Textron (United States)	61
23. Thales (France)	63
24. Walchandnagar Industries (India)	65
Financiers and Profiteers	66
Key findings	67
Divesting institutions	68
Full investment table	70
Conclusion	88
Endnotes	90

Key findings

\$747 billion invested in 24 nuclear weapon producing companies.

\$746,677 million was made available to the nuclear weapons producing companies between January 2020 and July 2022, a \$61.5 billion increase from the previous year. The increase can be attributed to an increase in shareholding in 2022 compared to 2021. Bondholding values dropped by \$1 billion. Loans and underwriting also decreased with \$31.2 billion and \$14.7 billion respectively.

306 financial institutions invest

306 institutions have financing or investment relationships with the 24 nuclear weapon producing companies.

24 Companies producing nuclear weapons

Companies from China, France, India, Italy, the Netherlands, the Russian Federation, the United Kingdom and the United States are significantly involved in the production of nuclear weapons. Many of the companies involved have multi-year contracts, totalling at least \$280 billion and continuing for decades.

Northrop Grumman is the biggest single nuclear weapons profiteer, with at least \$24.3 billion in contracts, not including consortium and joint venture revenues. Aerojet Rocketdyne, BAE Systems, Boeing, Lockheed Martin and Raytheon Technologies also hold multi-billion-dollar contracts for nuclear weapon production and/or stockpiling.

The list of companies profiled in this report and the arsenals to which they contribute are:

1. Aerojet Rocketdyne (United Kingdom, United States);
2. Airbus (France);
3. BAE Systems (France, United Kingdom, United States);
4. Bechtel (United States);
5. Bharat Dynamics (India);
6. Boeing (United Kingdom, United States);
7. China Aerospace Science and Technology (China);
8. Constructions Industrielles de la Méditerranée (CNIM Systèmes Industriels has now been acquired by Groupe REEL') (France);
9. Fluor (United States);
10. General Dynamics (United Kingdom, United States);
11. Honeywell International (United States);
12. Huntington Ingalls Industries (United States);
13. Jacobs Engineering (United States);
14. L3 Harris Technologies (United States);
15. Leidos (United States);
16. Leonardo (France);
17. Lockheed Martin (United Kingdom, United States);
18. Northrop Grumman (United Kingdom, United States);
19. Raytheon Technologies (United States);
20. Rostec (Russian Federation);
21. Safran (France);
22. Textron (United States);
23. Thales (France), and;
24. Walchandnagar Industries Limited (India).

Introduction

The Russian invasion of Ukraine and the explicit threats to use nuclear weapons that followed have sparked global unrest and fears of nuclear escalation, unprecedented since the 1962 Cuban Missile Crisis. In this context, the need to immediately prioritize the prevention of escalation and its potentially catastrophic humanitarian consequences should be self-evident. Yet, some states' responses, including allowing nuclear exercises to proceed, have further contributed to already heightened tensions.

All nuclear threats are unacceptable. Nuclear weapons remain the most destructive, inhumane and indiscriminate weapons ever created. No state or agency would be able to address the immediate or long-term consequences of the detonation of a nuclear weapon. The Russian invasion in Ukraine has illustrated that these weapons of mass destruction do not preserve peace and stability but are rather used as a tool to blackmail and facilitate a campaign of aggression against another country.

The Treaty on the Prohibition of Nuclear Weapons (TPNW), which entered into force in January 2021, is the only international legally-binding instrument under which nuclear threats are explicitly prohibited.² In June 2022, the Treaty's first Meeting of States Parties was held in Vienna, where states parties unequivocally condemned “any and all nuclear threats, whether they be explicit or implicit and irrespective of the circumstances”. The Treaty also prohibits the manufacture, production and development of nuclear weapons, as well as assistance with those acts.

The need for nuclear disarmament has never been so urgent. Yet, all nine nuclear-armed states continue to modernize their nuclear arsenals. In 2021, an estimated \$82.4 billion was spent on these weapons.³ This report includes information about the nuclear weapon systems of six of the nine nuclear armed countries which contract the private sector to produce key components necessary for their nuclear arsenals: the United States, the United Kingdom, France, China, Russia and India. New nuclear weapons systems, including the US LGM-35A Sentinel,

formerly known as the Ground Based Strategic Deterrent, and Long Range Standoff weapons, the French ASMPA-successor the ASN4G, and the Indian efforts to expand to submarine launched ballistic missiles are also presented in this report.

Nuclear weapon producing companies

This report provides an overview of the investments in 24 companies heavily involved in the production of nuclear weapons. The biggest nuclear weapon profiteer remains Northrop Grumman, with at least \$24.3 billion in outstanding contracts, not including the consortium and joint venture revenues. Aerojet Rocketdyne, BAE Systems, Boeing, Lockheed Martin and Raytheon Technologies also hold multi-billion-dollar contracts for nuclear weapon production and/or sustainment.

Companies often do not bid for government contracts on their own. As outlined further down in this report, there are numerous joint ventures and consortiums operating across the global nuclear weapons industry. Mergers and acquisitions have further limited the number of players in the nuclear weapon industry. Examples from recent years include the acquisition of Orbital ATK by Northrop Grumman⁴ and the mergers between Raytheon Company and United Technologies Corporation⁵, and between Harris Corporation and L3 Technologies⁶. In February this year, Lockheed Martin announced it had terminated a \$4.4 billion agreement to acquire Aerojet Rocketdyne, after the deal had sparked significant controversy over the competitive advantage that would be gained by the company and was ultimately challenged in a lawsuit by the Federal Trade Commission.⁷

The shrinking of competition space for contract awards in the nuclear weapon industry may further heighten the risks already attached to the activities of these companies. An example is the contract extension awarded by the Department of Energy's National Nuclear Security Administration (NNSA) to Consolidated National Security (CNS) in October this year, to continue managing and operating the Y-12 National Security Complex and Pantex Plant, for up to five and three years respectively.⁸ The extension was granted in spite of the NNSA's announcement in July 2020 that it had ended its deal with CNS after the latter had failed to meet safety and security standards, including lapses that could have injured workers and released radioactive material within the Y12 Complex.⁹ As concluded by the NNSA in its annual

contractor report card, there was a failure by CNS “to correct serious, longstanding performance problems that either introduced or perpetuated unacceptable risk to the overall operation”¹⁰ While the NNSA initially sought to award the contract to manage both sites to Nuclear Production One¹¹, this was cancelled after CNS filed complaints with the Government Accountability Office, citing a conflict of interest in the search process.¹² As a result, and in spite of a two-year search for a new manager, CNS remains responsible for both sites until at least 2025.

Financial sector leverage

Altogether 306 financial institutions made more than \$746 billion dollar available to the nuclear weapon industry between January 2020 and July 2022, a \$61.5 billion increase from the previous year. Investors and financiers are predominantly based in countries that include nuclear weapons in their national security strategies.

Financial institutions that back nuclear weapon producing companies enable them to continue their involvement in the development and production of these weapons of mass destruction, adding to the heightened risk of nuclear escalation that the world is witnessing today. While financiers that provide loans or underwrite bond issuances may in some cases exert some influence on the direction of a company by limiting the scope their financing can be used for, most financing of nuclear weapon producing companies is listed for “general corporate purposes”. In other words, these funds are un-earmarked and there is no way to guarantee they are not facilitating nuclear weapon production. Moreover, even ‘earmarked’ funds tend to free other capital flows that companies can use at their discretion. Financial institutions therefore have an important role to play in joint efforts towards nuclear disarmament.

Investor impact on choices around a company's direction is not often publicised. However, pressure from financial institutions has been cited as the reason that Serco, formerly involved in development of the UK nuclear arsenal, would no longer bid for any nuclear weapon related contracts.¹³

Over the past decade, most investors have implemented policies to manage risks in the Environmental, Social and Governance (ESG) areas. The Environmental and Social risks involved in the production of nuclear weapons are quite clear. They have been the reason why over 100

financial institutions currently exclude nuclear weapon producers from investments. As also described further down in this report, in several countries as well as at the European Union level, legislation is now in place or being developed that requires arms producers and financial institutions to disclose if and how possible negative ESG effects of their investments are taken into account in their decision-making. As illustrated by the management issues of the Y-12 National Security Complex and Pantex Plant described above, concerns around governance may add to the already existing environmental and social risks attached to the nuclear weapon industry.

Financial institutions can react to and reinforce norms. From action to end apartheid to supply chain analyses that help understand a company's impact on human rights and the environment, the financial sector's role in society is more prominent than ever before. When an investor chooses to end its relationship with a company because of the latter's involvement in the production of nuclear weapons, it sends a clear signal to the world that weapons of mass destruction are never acceptable.

The role of financial institutions in furthering efforts to reduce the role of nuclear weapons in society was exemplified by the engagement of the sector in the first Meeting of States Parties to the TPNW in June 2022. At that meeting, Italian asset manager Etica funds delivered a joint statement on behalf of a group of 37 investors, that called upon states to apply the prohibition on assistance to prohibited acts under the Treaty to all forms of financial assistance, including those made by the private sector operating within their jurisdiction. As put forward in the statement, “[i]t would be illogical to prohibit the production of nuclear weapons without prohibiting the financing that enables the production to proceed”¹⁴

The entry into force of the TPNW, rendering nuclear weapons illegal under international law - like biological and chemical weapons, antipersonnel landmines and cluster munitions - has added significant support to efforts to change the behaviour of corporations involved in producing and maintaining nuclear weapons. All sectors have an opportunity to build on and reinforce these norms, and to generate the pressure needed to remove nuclear weapons from all arsenals.

What this report does

This report profiles the companies most heavily involved

in the nuclear weapon industry. It provides information about the contracts they have for the production of key components for nuclear arsenals. This report also provides information on the financial actors financing these companies, through loans or other corporate financial services. In doing so, it offers a snapshot of those who seek to profit from their investments in companies that are complicit in the nuclear industry.

What it doesn't do

This report is not designed to draw a line between every rivet and the nuclear missiles they hold together. The list of companies involved in the nuclear weapon industry included in this report is comprehensive, but not exhaustive. Other companies may still be involved in the development, testing, production, manufacture and stockpiling of nuclear weapons systems. This report provides full profiles of 24 companies and includes a watchlist with additional information about others connected to the nuclear weapons enterprise. This report does not offer investment advice, but many may choose to use the identified list of corporate actors as a guide for their own responsible investing.

Legislation with implications for nuclear weapons producers and their investors

In the European Union, legislation is prepared to ensure responsible corporate behaviour. Such legislation already exists at various national levels. In France, for instance, the 'Loi de Vigilance', adopted in 2017, makes human rights due diligence mandatory for the companies in the law's scope. Similar legislation has been adopted in Germany, and is underway in the Netherlands. In general terms these laws (will) require companies (including financial institutions) to manage (prevent, mitigate and remediate) the risk that they become involved in human rights violations or environmental damage. This section provides a brief overview of their implication for arms producers, including nuclear weapon producers and the financial institutions investing in them.

National legislation

In 2017, France adopted the 'Loi de Vigilance', which requires France's largest companies to conduct human rights due diligence. Companies in scope are required to publish 'vigilance plans'. Such plans should focus

on possible adverse impacts in their value chain, both upstream (their supply chain) as well as their own activities.¹⁵ Thales, included in this report, is required to submit such a 'Vigilance Plan'. In its 2022 plan, Thales interestingly claims it is not involved in production or sales of nuclear weapons.¹⁶

The German supply chain law (Lieferkettengesetz) was adopted in 2021 and will enter into force in 2023. The law is seen as weaker than the French law and proposed EU legislation (see below).¹⁷

In the Netherlands, legislation has been proposed by a parliamentary party, and the government indicated late 2021 it would start working on a legal framework. When the EU proposed its legislation in early 2022, and after a change of government around the same time, the Dutch government indicated its willingness to develop legislation in tandem with EU legislation. In November 2022, a broader coalition of parliamentary parties submitted an updated version of the proposed law. This law is based on a broad obligation for companies to implement a duty of care, carrying out due diligence across the value chain and including possible negative effects of their own actions. The law is currently under parliamentary review.¹⁸

All legislation described above foresees mechanisms of accountability and monitoring of compliance, albeit in different forms.

Corporate Sustainability Reporting Directive and Sustainable Finance Disclosure Regulation

The Corporate Sustainability Reporting Directive (CSRD) and the Sustainable Finance Disclosure Regulation (SFRD) are aimed at more transparency surrounding companies' management of social, environmental and governance risks. The CSRD is the latest version (2021) of a regulation that requires companies to report on non-financial risks, including human rights violations and environmental damage.¹⁹ The SFRD is focused exclusively on the financial sector. The legislation, which came into force in 2021, requires financial institutions to disclose whether they consider possible negative effects of their investments (social, environmental and governance).²⁰ And if they state they do consider these possible negative effects, the legislation also requires financial institutions to clarify *how* they factor these possible negative effects in their decision making.²¹ It is possible to make a negative statement, so to state that possible negative effects are not factored in

decision making on investments, but this is not allowed for companies with over 500 employees.²²

Europe's Taxonomy

In 2020, the EU established a taxonomy of sustainable activities. The regulation defined which economic activities should be considered as 'sustainable', and which activities should not be considered as such. The taxonomy is currently limited to environmental sustainability. It is an explicit goal of the taxonomy to steer investments of the financial sector in a more sustainable direction.²³ In February 2022, the European 'Platform on Sustainable Finance', an advisory body to the European Commission, published a report on a 'social taxonomy', outlining a possible taxonomy focused on social instead of environmental issues. In the report, the Platform considered the arms industry as well. Under the header 'Harmful activities to be considered for a social taxonomy', the Platform lists a number of treaties governing the use of weapons, amongst which the TPNW.²⁴ The EU has not yet put in motion legislative action to establish a social taxonomy. If this report is used as a basis for potential EU legislation, then the inclusion of nuclear weapon producers in a list of 'harmful activities' would make clear to investors the risks they face if investing in these companies.

Europe's Corporate Sustainability Due Diligence Directive

The European Union is also working on legislation to make corporate social responsibility mandatory. The European Parliament pushed for such legislation, and in February 2022, the European Commission published its proposal: the Corporate Sustainability Due Diligence Directive. Various versions of the draft law are in circulation at the moment of writing, as both the European Parliament and the European Council are working on different amendments to the proposed law. In current proposals, the law would apply to financial institutions as well. It is clear that the law will cover most arms producers in the EU. However, in some versions of the law, the downstream value chain is excluded for arms producers. In effect, that could mean that nuclear weapon producers would not be required by this law to consider the negative effects of their products. At the moment of writing it is unclear whether in such a scenario the downstream activities of financial institutions (i.e. their investments in nuclear weapon producers) would fall under the scope of this law.

Financial sector addresses inaugural TPNW meeting

For the first time, investors were directly represented at a conference of parties to a disarmament treaty. The Italian asset manager Etica Funds²⁵, on behalf of a group of 37 investors, successfully presented a joint statement to the first meeting of states parties to the Treaty on the Prohibition of Nuclear Weapons (TPNW).

After the initial presentation, the statement was revised to increase its impact and reach. The updated statement is open to asset owners and asset managers for their signature and the full text is available at this link (https://divest.icanw.org/investors_open_statement_to_states_parties_on_the_treaty_on_the_prohibition_of_nuclear_weapons_tpnw)

The original statement called for the prohibition of all forms of financial assistance to the nuclear weapons industry, including by the private sector. The aim is to restrict access to financing for companies producing nuclear weapons or their key components. When this approach was applied to cluster bombs, it succeeded in deterring many major arms manufacturers from expanding their production.

Companies involved in the business of nuclear weapons are diversified enough to halt the production of such weapons and still provide value to shareholders. For example, in 2021 Boeing's nuclear weapons related turnover was \$300 million, compared to an overall revenue for the company of more than \$62 billion; whilst in the same year General Dynamics generated \$1.7 billion from nuclear weapons contracts, a fraction of their \$38 billion revenue.

The financial sector can encourage companies to make such shifts away from nuclear weapons by announcing divestment, issuing policy statements, and undertaking shareholder action.

However, the joint statement delivered to the TPNW meeting went further. It demonstrated the will of financial companies to work together with other stakeholders dedicated to protecting the environment and society from the worst consequences of nuclear weapons. This was the first time that investors took part in a disarmament treaty and stood beside impacted communities and concerned governments to combat nuclear threats and commit to action.

As the first major UN conference specifically focused on nuclear weapons since the Russian invasion of Ukraine, the meeting condemned “unequivocally any and all nuclear threats, whether they be explicit or implicit and irrespective of the circumstances”.²⁶

Further, the state parties agreed that the precedent set by Russia by intimidating other countries with nuclear threats showcases the fallacy of nuclear deterrence theory: it can no longer be claimed that nuclear weapons preserve peace, security or stability.

The meeting hosted 83 countries, including non-signatory states such as Belgium, Finland, Germany, the Netherlands, Norway, Sweden, Switzerland and Australia. The meeting focused on the implementation of the TPNW, resulting in a Political Declaration: the Vienna Declaration; and the Vienna Action Plan.

The Vienna Declaration made a firm commitment and recognized that the path towards a nuclear weapons free world will not be without challenges and obstacles, nevertheless countries committed to “not rest until the last state has joined the Treaty, the last warhead has been dismantled and destroyed and nuclear weapons have been totally eliminated from the Earth.”²⁷

In seeking to promote the underlying rationale of the total elimination of nuclear weapons, the Action Plan aims to “encourage and support the involvement and active cooperation of all relevant partners”. This provides an opportunity for further action from stakeholders, including investors and financiers.

According to Aldo Bonati, Stewardship and ESG Networks Manager at Etica Funds, “there are two main reasons for an asset management company to be concerned about nuclear weapons: the first is a moral imperative: war is never a solution to political controversies and armaments can never generate positive consequences. The second reason is financial: the threat of actually using nuclear weapons creates a systemic portfolio risk for investors. The mere news of their possible deployment has an immediate negative effect on financial markets, across every sector and asset class. As an investment company, we strive to minimize the chances of any negative risk, all the more so in this case. This is precisely the kind of risk management our clients expect and deserve”.



PHOTO 2: Italian asset manager Etica Funds addresses TPNW first Meeting of States Parties | Photo credit: Alexander Papis

24 Nuclear weapon producing companies

This report includes information about known contracts for key components necessary to maintain the lethality of nuclear weapons. 24 companies are profiled in this report. For a company to be included in this list, it must be open to private investment and produce goods or services that specifically contribute to nuclear weapon development, testing, production, manufacture, possession, stockpiling or use. All these activities are outlawed under the Treaty on the Prohibition of Nuclear Weapons (TPNW).

Nuclear bombs may be dropped from airplanes, like the ones used on Hiroshima and Nagasaki. However, most nuclear weapons in the arsenals of the nine countries that possess them are designed to be delivered by missiles launched from the ground, airplanes, or submarines. It is for this reason that this report includes companies involved in producing key components for not only the nuclear warheads but also the missiles designed specifically for nuclear weapon use. On the other hand, companies exclusively involved in the production of airplanes (like the B52-Stratofortress) or submarines (like the UK's Vanguard class of ships) which may be dedicated to missions to use nuclear weapons, are excluded from the full profiles in this report. Nevertheless, as some financial institutions are now excluding nuclear armed submarine producers from their investments, summary profiles are included for reference purposes.

Where available, information about the contract duration and total estimated value is included. However, one of the challenges in reporting is providing the same level of information for each of the nuclear-armed countries. For some arsenals, the availability of this information is relatively straightforward. For other arsenals, including those of China, Russia, North Korea and Pakistan, it is very difficult to obtain reliable information on the companies involved. In the case of China, however, the increased monitoring of construction activity, including through open-source satellite investigation, provides information on locations that can help track down

company involvement in key facilities. Chinese industries are also reaching out more externally to finance debt. Combined with the request for more transparency by investors from companies engaged in the Silk Road initiative, there is scope to include more Chinese companies in future reporting. China Aerospace Science and Technology (CASC), at the group level, is included in this report because of this increase in available information.

The biggest nuclear weapon profiteer remains Northrop Grumman, with at least \$24.3 billion in outstanding contracts, not including the consortium and joint venture revenues. Aerojet Rocketdyne, BAE Systems, Boeing, Lockheed Martin and Raytheon Technologies also hold multi-billion-dollar contracts for nuclear weapon production and/or stockpiling.

Nuclear armed countries have dedicated facilities to nuclear weapon production, manufacture, testing, stockpiling and development. In several situations, the management and operations of those facilities are outsourced to the private sector, and where information is publicly verifiable, those companies are also included in this report.

There are always companies changing name or changing hands. This report includes updated information about those changes. There is also a section that describes the tangled web of joint ventures and consortiums. These joint ventures and consortiums also have multi-year multi-billion-dollar contracts. Millions are for example paid each year by the French government to the MBDA joint venture between BAE systems, Airbus and Leonardo to build the next generation of nuclear weapons for France. For example, the Lawrence Livermore National Security Consortium, of which Bechtel is a part, has a \$61.6 billion contract to manage and operate the Lawrence Livermore National Laboratory. This laboratory is responsible for the life extension of the W78 warhead (carried by the Minuteman III ICBM), the B83-1 gravity bomb (delivered by B-52 and B-2 bombers) and the W80 (the Air Force Long- Range Standoff missile) among other activities to support the full US arsenal.²⁸

The goal of this research is to provide information about the many actors involved in perpetuating nuclear weapons. The nuclear weapons associated companies profiled in this report are already included on the exclusion lists of numerous financial institutions as well as some indices. The hope is that this report provides further information for those who choose to avoid supporting the companies that contribute to the indefinite retention of nuclear weapons.

Changes from previous reports

Larsen & Toubro moved to watchlist

In the November 2021 Don't Bank on the Bomb publication, Larsen & Toubro (L&T) was included with a full profile. However, the company currently claims not to "manufacture any explosives or ammunition of any kind, including [...] nuclear weapons or components of such munitions" nor any delivery systems.²⁹ Further information clarifying L&T's precise scope of activities related to nuclear weapon production, deployment or stockpiling is currently unavailable. For this reason, the company has been moved to the watchlist.

Volat added to watchlist

Belarusian company Volat was added to the watchlist, as the production of mobile launchers for the Russian Topol missiles is mentioned on their website.

Groupe REEL takes over CNIM Systèmes Industriels

In September 2022, Groupe REEL completed its acquisition of CNIM Systèmes Industriels.³⁰ CNIM Systèmes Industriels is contracted by the French government to supply missile launch systems for their nuclear submarines.³¹ Groupe REEL will take over responsibilities for the designing of equipment for the assembly and loading of missiles for the strategic nuclear submarines.³²

Northrop Grumman's IT and Mission Support Services Business taken over by Veritas Capital and Peraton

In February 2021, Veritas Capital, combining its business with Peraton, completed its acquisition of Northrop Grumman's IT and Mission Support Services Business.³³ As a result, Peraton is now the recipient of a \$6.7 million contract for work on the Minuteman III system, previously held by Northrop Grumman.³⁴

Watchlist

The full profiles listed in this report focus on the production of key components for nuclear weapons. Still, there are other companies involved in activities prohibited by the TPNW, including the building of facilities to enable any stationing, installation, or deployment of nuclear weapons on the national territory of other countries. There are also several companies that are not currently publicly traded, and while these fall outside the scope of the report, some information may be of interest.

The watchlist also provides an overview of companies for which clear ties to the nuclear weapons enterprise have been identified, but who act as subcontractors or for whom the specific details of their involvement are not available. For financial institutions and others seeking to implement comprehensive exclusions from any nuclear weapon associated company, the watchlist should, at a minimum, trigger additional due diligence.

The following profiles are not a comprehensive review of companies of this nature. Rather they are an example of the types of companies also involved in the nuclear weapon industry.

Amentum (United States)

Amentum is the US government services company that spun off from AECOM.³⁵ It is part of the team managing and operating the Lawrence Livermore National Lab³⁶ and the Los Alamos National Lab for US nuclear warhead production and maintenance.³⁷ Amentum also has contracts to support missile testing for US nuclear weapon programmes.³⁸ The company is also involved in nuclear waste storage at several facilities in the US and UK, as well as environmental remediation.³⁹ Amentum is not publicly traded and is a privately held company where the equity firms American Securities and Lindsay Goldberg are equal partners.⁴⁰ In November 2021, Nuclear Production One, a joint venture between Amentum and Fluor, was awarded the contract to manage and operate the Y-12 National Security Complex and the Pantex Plant,⁴¹ yet this contract award was terminated in May 2022 when the US Department of Energy announced it would hold two new competitions for separate contracts to manage each site.⁴²

Atlantic CommTech Corp (United States)

In July 2022, Atlantic CommTech Corp was awarded a contract by the US Air Force for "engineering services and technical expertise as needed to improve sustainability, extend service life of WS3 [Weapon Storage and Security System], and ensure systems continue to meet US Air Force in Europe and NATO requirements".⁴³ While the current description of the contract on the US DOD website adds that work will be carried out "in various oversea locations", other descriptions explicitly mention the Lakenheath Airbase in the United Kingdom⁴⁴, which, according to experts, may again become a storage location for U.S. nuclear bombs⁴⁵. The contract value is \$11.2 million and work is expected to be complete by July 2025. A similar contract held by Atlantic CommTech Corp for services

in support of the WS3 of bases in Europe concluded in October 2022.⁴⁶

Banda Group International (United States)

Banda Group was awarded a contract valued up to \$6.5 million in January 2019 for nuclear explosive safety by the US Department of Energy. The contract description indicates that it includes efforts to maintain and enhance the safety, security, and reliability of the US nuclear weapons stockpile.⁴⁷ Banda Group's responsibilities have not been assessed to provide key components to facilitate nuclear weapon use, but rather to provide trainings and safety controls to ensure that nuclear weapons are not accidentally detonated.⁴⁸

Battelle Memorial Institute (United States)

Battelle is involved in the management of the Lawrence Livermore National Laboratory, the Los Alamos National Laboratory and the Savannah River National Laboratory.⁴⁹ Battelle accepts numerous contracts, but is established as a non-profit organisation.⁵⁰

Booz Allen Hamilton Holding Corp (United States)

Booz Allen Hamilton is a teaming subcontractor for the Consolidated Nuclear Security (CNS) Joint Venture⁵¹, and involved in a contract for design and construction of a Uranium Processing Facility (UPF) at the Y-12 National Security Complex.⁵² The contract also includes an option to manage tritium operations at the Savannah River Site in South Carolina. Nevertheless, most activities conducted by Booz Allen Hamilton Holding Corp, in regards to other contracts, appear not to be related to the production of key components of nuclear weapons. Therefore, a full profile is not included in this report.

Charles Stark Draper Laboratory (United States)

Charles Stark Draper Laboratory (CSDL) is a US-based non-profit research and development organization⁵³ that has been involved in the intercontinental ballistic missiles (ICBM) development of the United States since the 1950s.⁵⁴ CSDL is a non-profit research and development organisation and not open to external investors. However, it is included here for its significant involvement in research and design for US and UK Trident II (D5) missiles.⁵⁵ According to the US Department of Defense, "CSDL possesses the unique knowledge of the total Trident Guidance system including its design and use on the Trident II weapon system."⁵⁶ There are several outstanding contracts between the US and CSDL for Trident-related components.⁵⁷ These contracts

are paid by both the US and the UK governments. The estimated total value of the contracts exceeds \$1,3 billion and will include work through at least 2027.

China National Nuclear Corporation (China)

China National Nuclear Corporation (CNNC) provides key components for the Chinese nuclear arsenal. The China Council for the Promotion of International Trade (CCPIT) promotes CNNC as the core of China's nuclear deterrence.⁵⁸ It adds that the company developed atomic and hydrogen weapons and that "CNNC is the main part of China's nuclear science and technology advancement [...] and the major force of nuclear power development".⁵⁹ CNNC is a state-owned enterprise and not publicly listed, and therefore does not have a full profile.

Cray (United States)

Cray, Inc received a \$600 million contract to build an exascale high-performance supercomputer—El Capitan—by 2022.⁶⁰ The system will be built to assess US nuclear warheads' viability and reliability without nuclear testing. The system will provide new and faster 3D simulation and modelling capabilities. It will also offer advanced computational tools for scientists and weapon designers to study the use of new materials and components.

HDT Global (United States)

HDT Expeditionary Systems, Inc, a subsidiary of HDT Global, was awarded a contract in May 2013 to contribute to the Minuteman III Transporter Erector Replacement Programme. The contract is worth up to \$104.9 million and is meant to finish in March 2023.⁶¹ HDT Global will provide the transportation systems in support of the modernization of the US intercontinental ballistic missile system (ICBM), as part of a Northrop Grumman-led team.⁶²

Kratos Defense and Security Solutions (United States)

Kratos will provide vehicle transporters for the Sentinel, the new US Ground Based Strategic Deterrent, though Northrop Grumman remains the prime contractor.⁶³ The subcontract value is unknown.

Larsen & Toubro (India)

Larsen & Toubro Limited (L&T), based in India, is a technology, engineering, construction, manufacturing and financial services conglomerate.⁶⁴ L&T states it has designed and produced the launch system for the Dhanush nuclear-capable short range ballistic missile.⁶⁵ The company stated in its 2020-2021 annual report that it does not "manufacture

any explosives or ammunition of any kind, including [...] nuclear weapons or components of such munitions" nor any delivery systems.⁶⁶ While L&T operates a Strategic Systems Complex (SSC) in Maharashtra, in which series production of Strategic Weapons Platforms takes place⁶⁷, further information clarifying as to whether this work is related to the production of key components necessary to the lethality of nuclear weapons, is currently lacking. However, L&T is involved in the production of India's first nuclear armed ballistic missile submarines, the INS Arihant⁶⁸, yet these activities fall outside the scope of this report.

Merrick & Company (United States)

Merrick, along with Strategic Management Solutions, provides support for the Triad National Security joint venture at the Los Alamos National Laboratory.⁶⁹ Its work is primarily associated with large-scale infrastructure. The company is listed here for information purposes as it is directly associated with the Los Alamos Nuclear Laboratory, responsible for US nuclear weapon modernisation and stockpile retention⁷⁰. However, the services it provides appear to be outside the scope of this report. In 2019, Merrick & Company opened an office to support activities at the Savannah River Site as well, yet the bulk of activities appear not to be specific to nuclear weapons.⁷¹

Moog, Inc. (United States)

Moog has an outstanding contract with the US Department of Defence to replace the arm/disarm switches on the Minuteman III weapon system.⁷² The company also includes information on its website about producing electrohydraulic TVC systems for the Trident system, but no current contracts were identified. Moreover, this part is also usable in devices that are not specifically designed for nuclear weapons.⁷³ It therefore falls outside of the scope of this report, so a full profile is not included. Some financial institutions choose to exclude Moog for this and for the legacy involvement in the Trident D5 system the company advertises on its website.⁷⁴

N3B Los Alamos (United States)

N3B is a limited liability company owned by HII Nuclear, a subsidiary of Huntington Ingalls Industries, and BWX Technologies, joined by critical subcontractors Longenecker and Associates and Tech2 Solutions.⁷⁵ It holds a contract for environmental remediation services at the Los Alamos National Laboratory, a US nuclear weapons lab.⁷⁶ It is also comprised of companies engaged in production of key components for nuclear weapons.

Parsons (United States)

Parsons is part of the Northrop Grumman team working to design the next US intercontinental ballistic missile, the Sentinel (formerly known as the Ground Based Strategic Deterrence).⁷⁷ Parsons is involved in engineering, procurement, and construction. While it is part of the Northrop Grumman team working on the Sentinel, it is not known whether this technology is specifically designed for the nuclear weapons.

Peraton (United States)

Peraton is involved in the maintenance and development of the Trident II (D5) for the US arsenal. In October 2021, Peraton's \$109.6 million contract for program support services for the Trident re-entry subsystem was modified to extent until at least 2025.⁷⁸ In February 2021, Veritas Capital, combining its business with Peraton, completed its acquisition of Northrop Grumman's IT and Mission Support Services Business.⁷⁹ As a result, Peraton is now the recipient of a \$6.7 million contract for work on the Minuteman III system, previously held by Northrop Grumman.⁸⁰ Peraton also holds a \$360 million contract running until 2039 to manage intercontinental ballistic missile software safety risk.⁸¹ Peraton is a private company, not publicly traded, and is therefore not listed with a full profile.

SOC LLC (United States)

SOC provides Safeguards, Security, and Emergency Services for the Y-12 & Pantex sites in the US.⁸² SOC is a Day & Zimmerman company, providing a range of security services.⁸³ As a security service provider, the company is outside the scope of this research.

Strategic Management Solutions (United States)

Strategic Management Solutions provides support for the Los Alamos National Laboratory management and operations contractor Triad National Security (a consortium).⁸⁴ The role played by this company is primarily one of project management.⁸⁵ Its involvement in the management of LANL's nuclear component manufacturing, warrants a note, though not a full profile.⁸⁶

Systems Planning and Analysis Inc. (United States)

Systems Planning and Analysis Inc. (SPA) was awarded a contract for support and engineering services related to the Trident II (D5) programme in 2020.⁸⁷ The contract has a potential value of \$12.4 million and is expected to be completed by September 2025. It also provides engineering and programmatic support for nuclear

weapons surety (NWS).⁸⁸In 2021, Arlington Capital Partners, a private equity firm, acquired SPA, aiming to merge it with MCM, already owned by ACP.⁸⁹

Volat (Belarus)

Volat (Minsk Wheel Tractor Plant Open Joint Stock Company) produces the mobile launchers for the Russian Topol missiles.⁹⁰ The company is wholly owned by the Republic of Belarus.⁹¹

Joint ventures

There are numerous joint ventures and consortiums operating across the global nuclear weapons industry. Each of these are named in the various producer profiles, but this section provides a listing showing their composite parts.

JOINT VENTURE/ CONSORTIUM NAME	COMPANIES INVOLVED	CONTRACTED FOR
Ariane Group	Airbus, Safran	M51 (France)
Consolidated Nuclear Security (CNS)	Bechtel, Leidos, ATK Launch Systems (part of Northrop Grumman), SOC, Booz Allen Hamilton	NNSA Production Office (NPO) Pantex Plant and Y-12 National Security Complex
Lawrence Livermore National Security partnership	Bechtel National, University of California, BWX Technologies, Amentum and teaming subcontractor Battelle Memorial Institute. ⁹²	Lawrence Livermore National Laboratory, including the life extension program for the W80-4 cruise missile warhead and nuclear design activities for the B83 bomb, W80 warhead and W87 warhead. ⁹³
MBDA	Airbus, BAE Systems and Leonardo	ASMPA (France) ASN4G (France)
National Technology and Engineering Solutions	Wholly owned subsidiary of Honeywell International. ⁹⁴	Management and operations of Sandia National Laboratories (US), involved in the modernisation of at least the W88 Alt 37 warhead ⁹⁵ and the W76-1 warhead ⁹⁶ (both used for arming the submarine launched Trident II (D5) missiles), the new W80-4 warheads for the Long Range Standoff missiles ⁹⁷ , and the new B61-12 gravity bomb. ⁹⁸
Roxel	MBDA ⁹⁹ Safran subsidiary Herakles ¹⁰⁰	ASMPA (France) ¹⁰¹
Savannah River Nuclear Solutions (SRNS)	Fluor Honeywell International Newport News Nuclear (part of Huntington Ingalls Industries) ¹⁰²	Tritium extraction ¹⁰³ and plutonium pit production ¹⁰⁴ (US)
Triad National Security LLC	Battelle Memorial Institute, the Regents of the University of California and, the Texas A&M University System ¹⁰⁵	Los Alamos National Laboratory (US) includes nuclear design and engineering of the B61, W76, W78, and W88 warheads. It also manages the life extension and alteration programs affecting the W76 warhead, the B61-12 bomb, and the W88 warhead ¹⁰⁶

Submarines

Submarines are outside the scope of this report. However, several of the companies involved in producing key components for nuclear arsenals are also involved in the production of nuclear armed submarines.

Babcock International

Babcock International produces submarines for the UK. It has a £3.5 billion, 5-year contract with the UK Ministry of Defence for naval base operations, including at the HMNB Clyde, where the UK nuclear armed submarines are stationed.¹⁰⁷ The group also announced contracts in 2016 for design and development work on the Trident nuclear submarine replacement programme.¹⁰⁸ In June 2020, Babcock was subcontracted by General Dynamics for additional support for both the UK Dreadnought and the US Columbia class submarines, designed to be armed with Trident nuclear weapons.¹⁰⁹

General Dynamics

General Dynamics is building the new nuclear-armed submarines (Columbia class) for the US Navy, under a \$17.6 billion, 14-year contract through 2031.¹¹⁰

Larsen & Toubro

Larsen & Toubro is involved in the construction of India's first indigenous nuclear powered ballistic missile submarine (SSBN), the INS Arihant.¹¹¹ The submarine was jointly developed by the Indian Navy, Bhabha Atomic Research Centre (BARC) and Defence Research and Development Organisation (DRDO), and built under the Advanced Technology Vessel (ATV) project, key to India's aim for a naval nuclear weapons capacity.¹¹² It conducted two submerged unit trials of nuclear capable K-15 missiles in 2018.¹¹³ Sources indicate that the Arihant will primarily serve as a training vessel and technology demonstrator and will not be deployed for nuclear deterrence patrols as additional SSBNs come online.¹¹⁴

Naval Group

Naval Group, formerly known as DCNS¹¹⁵, is a prime contractor for the French Navy and is currently developing a third-generation nuclear armed submarine for France.¹¹⁶ Naval group is also involved in the overhaul of the currently deployed French nuclear armed submarines. This includes equipping the submarines with the M51 missiles. The first nuclear submarine to be equipped with the M51 was *Le Terrible* in 2010, followed by the other

new-generation submarines, *Le Vigilant*, delivered in 2013, *Le Triomphant*, delivered in 2015, and most recently *Le Téméraire*.¹¹⁷In April 2021, an M51 missile (without the nuclear warhead) was test launched from *Le Triomphant*.¹¹⁸

Northrop Grumman

Northrop Grumman is contracted to produce key components for the US Columbia and UK Dreadnought class submarines. As Northrop is also producing several other nuclear weapon systems, a full profile is included below.

Rolls Royce

Rolls Royce produces key components for the new Dreadnought submarines for the UK nuclear weapons system. In 2019, the UK government awarded Rolls-Royce Submarines with a contract worth nearly £480 million for nuclear propulsion power plants. Rolls-Royce is also part of the Dreadnought Alliance, a joint management team between the SDA, BAE Systems and Rolls-Royce.¹¹⁹

TechnicAtome

TechnicAtome, along with Naval Group, is working on the early design phases of the new French nuclear ballistic missile submarine programme (SNLE 3G).¹²⁰ TechnicAtome is also involved in the Laser Megajoule programme, simulating French nuclear testing.¹²¹

Walchandnagar Industries Limited

Walchandnager Industries Limited (WIL) has a full profile below but is also involved in the engineering, manufacture, and onboard installation of weapon systems for the Indian strategic naval weapons programme.¹²² WIL is involved in India's first indigenous nuclear powered ballistic missile submarine, the INS Arihant. The submarine was jointly developed by the Indian Navy, Bhabha Atomic Research Centre (BARC) and Defence Research and Development Organisation (DRDO).¹²³ It conducted two submerged unit trials of nuclear capable K-15 missiles in 2018.¹²⁴ Sources indicate that the Arihant will primarily serve as a training vessel and technology demonstrator and will not be deployed for nuclear deterrence patrols as additional SSBNs come online.¹²⁵ India's second nuclear armed submarine, the Arighat, was launched in 2017 and began sea trials at the beginning of 2022.¹²⁶ Once commissioned, India will have a second SSBN equipped with the 750-KM range K-15 missile, designed for retaliatory nuclear strikes.¹²⁷



PHOTO 3: A non-nuclear mock B61-12 Joint Test Assembly (JTA) being prepared for test load for the B-2 Spirit bomber (U.S. Air Force photo by Airman 1st Class Devan Halstead)

Full company profiles

This section includes a company-by-company review. For an overview per weapon system, see the Executive Summary.

Included in each section:

Company profile

Contact information

Nuclear Weapons

Investors table

1. Aerojet Rocketdyne Holdings Inc. (United States)
2. Airbus Group (France)
3. BAE Systems plc (France, United Kingdom, United States);
4. Bechtel (United States)
5. Bharat Dynamics Limited (India)
6. Boeing (United Kingdom, United States)
7. China Aerospace Science and Technology (China);
8. Constructions Industrielles de la Méditerranée (France)
9. Fluor (United States)
10. General Dynamics (United Kingdom, United States);
11. Honeywell International (United States)
12. Huntington Ingalls Industries (United States)
13. Jacobs Engineering (United States)
14. L3 Harris Technologies (United States)
15. Leidos (United States)
16. Leonardo (France)
17. Lockheed Martin (United Kingdom, United States)
18. Northrop Grumman (United Kingdom, United States)
19. Raytheon Technologies (United States)
20. Rostec (Russian Federation)
21. Safran (France)
22. Textron (United States)
23. Thales (France)
24. Walchandnagar Industries Limited (India)

1. Aerojet Rocketdyne Holdings, Inc (United States)

COMPANY PROFILE

Aerojet Rocketdyne (AR) Holdings, Inc, formerly GenCorp, based in the United States, is engaged in aerospace and military (through subsidiary Aerojet Rocketdyne) and real estate (Easton Real Estate).¹²⁸ As of 31 December 2021, the relevant subsidiary of Aerojet Rocketdyne- Aerospace and Defence- had \$6.8 billion in outstanding contracts.¹²⁹ Aerojet Rocketdyne Holdings Inc is involved in design, development and production of land and sea-based nuclear ballistic missile systems for the US and UK arsenals. In the financial year ending 31 December 2021, Aerojet Rocketdyne Holdings, Inc reported net sales of \$2,188 million, resulting in a net income of \$143.7 million.¹³⁰

In December 2020, Aerojet Rocketdyne entered into a merger agreement with Lockheed Martin. The merger was expected to be completed in the fourth quarter of 2021, and would have made Aerojet Rocketdyne Holdings, Inc a wholly owned subsidiary of Lockheed Martin. The US Federal Trade Commission filed a complaint to stop the merger, claiming the deal would give Lockheed Martin an unfair competitive advantage, and Lockheed Martin terminated the merger process in February 2022.¹³¹

Contact

Aerojet Rocketdyne Holdings Inc.
222 N. Pacific Coast Hwy, Suite 500
El Segundo, CA 90245
1-310-252-8100

Website: www.aerjetrocketdyne.com/
Facebook: www.facebook.com/AerojetRdyne
Instagram: https://www.instagram.com/Aerojet_Rocketdyne/
LinkedIn: <https://www.linkedin.com/company/aerjet-rocketdyne>
Twitter: www.twitter.com/AerojetRdyne
YouTube: www.youtube.com/user/AerojetRocketdyne

NUCLEAR WEAPONS

Aerojet Rocketdyne builds solid boost propulsion systems used in the land- and sea-based nuclear ballistic missile systems for the US and UK arsenals. It has powered every US intercontinental ballistic missile (ICBM) ever fielded, including Trident II D5 missiles and the Minuteman III.¹³² Aerojet Rocketdyne is also contracted to manufacture the Post Boost Control System Gas Generator Units for the Trident II D5 program.¹³³

Aerojet Rocketdyne is developing the large solid rocket motor and the post-boost propulsion system and is responsible for the testing of post-boost system components for the Sentinel, the new US Ground Based Strategic Deterrent, as a key member of Northrop Grumman's nationwide GBSD team.¹³⁴ The latter was awarded a \$13.3 billion contract for the engineering and manufacturing of the GBSD in 2020, to be completed in February 2029.¹³⁵ Aerojet Rocketdyne has an additional five-year, \$20 million contract awarded in 2018 to produce solid boost technology for next generation US nuclear weapon systems.¹³⁶

Aerojet Rocketdyne is furthermore involved in a billion-dollar strategic agreement with Raytheon for propulsion for a range of missiles, including further hypersonic missile developments.¹³⁷ At this stage of the research and development it is still unclear whether those new missiles will carry a nuclear or conventional payload.

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 1: INVESTMENTS IN AEROJET ROCKETDYNE HOLDINGS, INC

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	GRAND TOTAL
American Century Investments	United States			\$21.2	\$21.2
Ameriprise Financial	United States			\$28.9	\$28.9
Apollo Global Management	United States		\$50.0		\$50.0
AQR Capital Management	United States			\$19.9	\$19.9
Arrowstreet Capital	United States			\$18.3	\$18.3
Balyasny Asset Management	United States			\$35.0	\$35.0
Bank of America	United States		\$341.7		\$341.7
Bank of New York Mellon	United States		\$30.0	\$23.4	\$53.4
Beach Point Capital Management	United States		\$50.0		\$50.0
BlackRock	United States			\$507.8	\$507.8
Capital One Financial	United States		\$45.6		\$45.6
Cathay General Bancorp	United States		\$37.2		\$37.2
Charles Schwab	United States			\$29.4	\$29.4
Citizens Financial Group	United States		\$45.6		\$45.6
D.E. Shaw & Co.	United States			\$21.9	\$21.9
Dimensional Fund Advisors	United States			\$66.5	\$66.5
Fifth Third Bancorp	United States		\$45.6		\$45.6
Gabelli Funds	United States			\$188.1	\$188.1
Gamco Investments	United States			\$20.3	\$20.3
Geode Capital Holdings	United States			\$50.0	\$50.0
Invesco	United States			\$19.5	\$19.5
JPMorgan Chase	United States		\$45.6		\$45.6
KeyCorp	United States		\$45.6		\$45.6
Melqart Asset Management	United Kingdom			\$26.7	\$26.7
Millennium Management	United States			\$180.5	\$180.5
Mitsubishi UFJ Financial	Japan		\$45.6		\$45.6
Morgan Stanley	United States			\$76.8	\$76.8
Northern Trust	United States			\$27.4	\$27.4
Nuance Investments	United States			\$92.5	\$92.5
Opus Corporate Finance LLP	United Kingdom		\$37.2		\$37.2
Owl Creek Asset Management	United States			\$27.3	\$27.3
Principal Financial Group	United States			\$19.9	\$19.9
Regions Financial	United States		\$45.6		\$45.6
Reinhart Partners	United States			\$55.1	\$55.1
Royal Bank of Canada	Canada		\$45.6		\$45.6
Sather Financial	United States			\$34.9	\$34.9
SMBC Group	Japan		\$37.2		\$37.2
State Street	United States			\$162.7	\$162.7
Steel Partners Holdings	United States			\$164.0	\$164.0
Thrivent Financial	United States	\$4.5			\$4.5
Truist Financial	United States		\$45.6		\$45.6
Two Sigma Investments	United States			\$62.8	\$62.8
US Bancorp	United States		\$45.6		\$45.6
Vanguard	United States			\$322.0	\$322.0
Voya Financial	United States			\$18.1	\$18.1
Water Island Capital	United States			\$28.6	\$28.6
Wells Fargo	United States		\$45.6		\$45.6
Zions Bancorporation	United States		\$45.6		\$45.6
GRAND TOTAL		\$4.5	\$1,130.0	\$2,349.5	\$3,484.0

2. Airbus Group (The Netherlands)

COMPANY PROFILE

Airbus is headquartered in the Netherlands but has its main production facilities in Germany, France and Spain.¹³⁸ It is involved in the commercial aircraft, helicopter, defence, security and space sectors.¹³⁹ Airbus is the exclusive provider of ballistic missiles used in the French nuclear arsenal through its participation in ArianeGroup and MBDA. ArianeGroup is a joint venture with French company Safran¹⁴⁰ and MBDA is a joint venture between BAE Systems (37.5%), Airbus (37.5%) and Leonardo (25%).¹⁴¹ In the year ending 31 December 2021, Airbus Group generated revenues of € 52.1 billion.¹⁴²

Contact

Airbus Group SE
PO Box 32008
2303 DA Leiden
The Netherlands

Website: <https://www.airbus.com/>
Facebook: <https://www.facebook.com/airbus/>
Instagram: <https://www.instagram.com/weareairbus/>
LinkedIn: <https://www.linkedin.com/company/airbusgroup/>
Twitter: <https://twitter.com/AirbusDefence>
YouTube: <https://www.youtube.com/user/airbusds>

NUCLEAR WEAPONS

MBDA France, in which Airbus has a 37.5% stake, is the prime contractor for the ASMPA medium-range air-to-ground nuclear armed cruise missile for the French nuclear arsenal.¹⁴³ MBDA is also contracted by the French government for work related to development of the ASMPA-successor, the ASN4G.¹⁴⁴ The new weapon is scheduled to enter service in 2035 with range exceeding 1,000km, double that of the ASMPA. The French Directorate General for Armaments indicated that the ASN4G will be a hypersonic missile.¹⁴⁵

Airbus is the main contractor for the M51 submarine-launched ballistic missiles, as part of ArianeGroup.¹⁴⁶ ArianeGroup states that its role in the M51 production “covers upstream research, design, development and production of the missiles, the land-based operating infrastructure and the command and control system on board the submarines. ArianeGroup is also responsible for the system support in service as well as end-of-life disposal”.¹⁴⁷ Airbus is also contracted for the development of the third version of the ballistic missile, M51.3, to be completed around 2025.¹⁴⁸

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 2: INVESTMENTS IN AIRBUS GROUP

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
ANZ	Australia		\$75.6			\$75.6
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$404.6		\$290.7	\$695.3
Banco de Sabadell	Spain		\$75.6			\$75.6
Bank of America	United States		\$253.5		\$68.1	\$321.6
Bank of China	China		\$177.9			\$177.9
Barclays	United Kingdom		\$404.6			\$404.6
BayernLB	Germany		\$253.5			\$253.5
BlackRock	United States			\$3,439.0		\$3,439.0
BNP Paribas	France		\$404.6		\$811.5	\$1,216.1
Capital Group	United States			\$3,852.8		\$3,852.8
Citigroup	United States		\$404.6			\$404.6
Commerzbank	Germany		\$494.5		\$118.1	\$612.6
Commonwealth Bank of Australia	Australia		\$75.6			\$75.6
Crédit Agricole	France		\$567.7	\$883.5	\$811.5	\$2,262.8
Crédit Mutuel CIC Group	France		\$331.3			\$331.3

Credit Suisse	Switzerland		\$253.5			\$253.5
Danske Bank	Denmark		\$75.6			\$75.6
DBS	Singapore		\$253.5			\$253.5
Deka Group	Germany			\$526.7		\$526.7
Deutsche Bank	Germany		\$567.7		\$70.9	\$638.6
DZ Bank	Germany		\$253.5			\$253.5
European Investment Bank	Luxembourg		\$947.0			\$947.0
Fidelity Investments	United States			\$1,159.7		\$1,159.7
Goldman Sachs	United States		\$253.5	\$2,591.8	\$68.1	\$2,913.3
Groupe BPCE	France		\$404.6		\$290.7	\$695.3
HSBC	United Kingdom		\$404.6		\$811.5	\$1,216.1
Industrial and Commercial Bank of China	China		\$253.5			\$253.5
ING Group	Netherlands		\$253.5			\$253.5
Invesco	United States			\$989.0		\$989.0
JPMorgan Chase	United States		\$326.8		\$811.5	\$1,138.3
KfW	Germany		\$253.5			\$253.5
Landesbank Baden-Württemberg (LBBW)	Germany		\$75.6			\$75.6
Landesbank Hessen-Thüringen	Germany		\$75.6			\$75.6
Lloyds Banking Group	United Kingdom		\$177.9		\$70.9	\$248.8
Lone Star Funds	United States		\$163.2			\$163.2
Manulife Financial	Canada	\$49.3				\$49.3
MassMutual Holdings	United States	\$59.8				\$59.8
Mitsubishi UFJ Financial	Japan		\$404.6			\$404.6
Mizuho Financial	Japan		\$567.7		\$219.8	\$787.6
Morgan Stanley	United States		\$253.5		\$189.0	\$442.5
NatWest	United Kingdom		\$404.6		\$257.1	\$661.7
Pacific Century Group	Hong Kong	\$316.6				\$316.6
Primecap Management	United States			\$945.5		\$945.5
Royal Bank of Canada	Canada		\$326.8		\$290.7	\$617.5
Santander	Spain		\$404.6		\$314.3	\$718.9
Skandinaviska Enskilda Banken	Sweden		\$253.5			\$253.5
SMBC Group	Japan		\$404.6		\$121.9	\$526.5
Sociedad Estatal de Participaciones Industriales	Spain			\$4,129.6		\$4,129.6
Société Générale	France		\$404.6	\$573.5	\$811.5	\$1,789.6
Standard Chartered	United Kingdom		\$75.6			\$75.6
T. Rowe Price	United States			\$1,120.9		\$1,120.9
TIAA	United States			\$477.1		\$477.1
Toronto-Dominion Bank	Canada		\$253.5			\$253.5
UBS	Switzerland		\$75.6			\$75.6
UniCredit	Italy		\$567.7		\$264.3	\$832.0
Vanguard	United States			\$1,664.9		\$1,664.9
Wellington Management	United States			\$866.4		\$866.4
Westpac	Australia		\$75.6			\$75.6
White Mountains Insurance	Bermuda		\$90.9			\$90.9
GRAND TOTAL			\$516.6	\$13,389.0	\$23,220.5	\$6,692.0
						\$43,818.0

3. BAE Systems plc (United Kingdom)

COMPANY PROFILE

BAE Systems, based in the UK, is a defence company operating in the air, maritime, land and cyber domains.¹⁴⁹ The company produces key components for the French, UK and US nuclear arsenals. BAE Systems has a 37.5% stake in the MBDA joint venture with Airbus and Leonardo.¹⁵⁰ In the financial year ending 31 December 2021, BAE Systems reported revenues of £19.5 billion, resulting in an operating profit of £2.38 billion.¹⁵¹

Contact

BAE Systems PLC Headquarters
PO Box 87 Aerospace Centre,
Farnborough GU14 6YU
United Kingdom
+44 (0) 1252 373232
baesystemsinfo@baesystems.com

Website: <https://www.baesystems.com/en/home>
Facebook: <https://www.facebook.com/BAESystemsplc>
Instagram: <https://www.instagram.com/baesystems/>
LinkedIn: <https://www.linkedin.com/company/bae-systems>
Twitter: <https://twitter.com/baesystemsplc>
YouTube: <https://www.youtube.com/BAESystemsplc>

NUCLEAR WEAPONS

BAE Systems is involved in three nuclear weapon arsenals: those of France, the United Kingdom and the United States.

BAE Systems is part of the MBDA joint venture. MBDA France is the prime contractor for the ASMPA medium-range air-to-ground nuclear armed missile for the French nuclear arsenal.¹⁵² MBDA is also contracted by the French government for work related to development of the ASMPA-successor, the ASN4G.¹⁵³ The new weapon is scheduled to enter service in 2035 with range exceeding 1,000km, double that of the ASMPA. The French Directorate General for Armaments indicated that the ASN4G will be a hypersonic missile.¹⁵⁴

BAE Systems is the prime contractor for the US Minuteman III Intercontinental Ballistic Missile (ICBM) system engineering/technical assistance support, training, and development.¹⁵⁵ In June 2022, BAE Systems received an 18-year, \$12 billion contract to continue supporting the sustainment of the US' ICBM inventory.¹⁵⁶

BAE is also contracted by the US government for work on the US and UK Trident II D5 strategic weapon systems, under several contracts valued at up to \$595 million¹⁵⁷, including for the providing of supply support and information technology services for the Trident II (D5) Strategic Weapon System (SWS) Program and the SSGN Attack Weapon System (AWS) Program.¹⁵⁸

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 3: INVESTMENTS IN BAE SYSTEMS

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Aegon	Netherlands			\$200.5		\$200.5
Affiliated Managers Group	United States			\$1,663.3		\$1,663.3
Allstate	United States	\$30.2				\$30.2
Ameriprise Financial	United States	\$29.9		\$462.9		\$492.8
ANZ	Australia		\$90.5			\$90.5
Artisan Partners	United States			\$484.1		\$484.1
Aviva	United Kingdom	\$36.8				\$36.8
Bank of America	United States		\$1,438.0		\$285.7	\$1,723.7
Bank of New York Mellon	United States			\$433.9		\$433.9
Barclays	United Kingdom		\$234.9	\$1,215.9	\$285.7	\$1,736.5
Black Creek Investment Management	Canada			\$248.4		\$248.4
BlackRock	United States			\$3,898.5		\$3,898.5
BNP Paribas	France		\$90.5		\$285.7	\$376.2

California Public Employees' Retirement System (CalPERS)	United States	\$61.2				\$61.2
Capital Group	United States				\$3,198.0	\$3,198.0
Citigroup	United States			\$907.1		\$285.7
Commerzbank	Germany			\$90.5		\$216.7
Corsair Capital Management	United States				\$470.1	\$470.1
Crédit Agricole	France			\$90.5		\$90.5
Crédit Mutuel CIC Group	France			\$90.5		\$90.5
Deutsche Bank	Germany			\$90.5		\$216.7
Equitable Holdings	United States	\$27.0				\$27.0
Federated Investors	United States				\$167.5	\$167.5
Fidelity Investments	United States				\$264.4	\$264.4
First Abu Dhabi Bank	United Arab Emirates			\$901.3		\$901.3
Franklin Resources	United States	\$29.8			\$1,067.8	\$1,097.6
Geode Capital Holdings	United States				\$165.3	\$165.3
Goldman Sachs	United States			\$90.5		\$216.7
Guggenheim Capital	United States	\$37.5				\$37.5
Invesco	United States				\$1,527.8	\$1,527.8
Japan Mutual Aid Association of Public School Teachers	Japan				\$166.3	\$166.3
JPMorgan Chase	United States			\$90.5		\$90.5
Jupiter Fund Management	United Kingdom				\$306.0	\$306.0
Lloyds Banking Group	United Kingdom			\$90.5		\$216.7
LSV Asset Management	United States				\$211.6	\$211.6
Macquarie Group	Australia	\$78.4				\$78.4
MetLife	United States	\$30.4				\$30.4
Mitsubishi UFJ Financial	Japan			\$1,171.5		\$1,171.5
Mizuho Financial	Japan			\$90.5		\$90.5
Morgan Stanley	United States			\$90.5		\$216.7
NatWest	United Kingdom			\$90.5		\$216.7
Northern Trust	United States			\$810.8		\$810.8
Perpetual	Australia				\$239.2	\$239.2
Prudential Financial (US)	United States	\$132.9				\$132.9
Royal Bank of Canada	Canada			\$234.9		\$285.7
Silchester International Investors	United Kingdom				\$919.6	\$919.6
Skandinaviska Enskilda Banken	Sweden			\$90.5		\$90.5
SMBC Group	Japan			\$90.5		\$90.5
Société Générale	France			\$90.5		\$285.7
State Farm	United States	\$86.5				\$86.5
State Street	United States				\$285.5	\$285.5
TCW Group	United States	\$42.4				\$42.4
The Hartford	United States	\$26.5				\$26.5
TIAA	United States	\$67.8				\$67.8
Toronto-Dominion Bank	Canada			\$90.5		\$90.5
Trinity Street Asset Management	United Kingdom				\$178.8	\$178.8
Unum Group	United States	\$30.0				\$30.0
Vanguard	United States				\$977.6	\$977.6
Wellington Management	United States	\$55.9			\$419.9	\$475.8
Wells Fargo	United States			\$234.9		\$285.7
White Mountains Insurance	Bermuda	\$88.2				\$88.2
GRAND TOTAL		\$891.4		\$7,381.4	\$19,172.9	\$3,300.0
						\$30,745.7

4. Bechtel (United States)

COMPANY PROFILE

Bechtel Group, a private company based in the US, operates as an engineering, construction and project management company.¹⁵⁹ Bechtel manages and operates the Lawrence Livermore National Laboratory (with Battelle and Texas A&M University), which, as its primary mission, supports the US nuclear weapons capabilities.¹⁶⁰ In the financial year 2021, Bechtel Group reported revenues of \$17.5 billion.¹⁶¹

Contact

12011 Sunset Hills Road
Reston, VA 20190-5918
United States
Tel: +1 571 392 6300

Website: <https://www.bechtel.com/>
Facebook: <https://www.facebook.com/bechtelcorp/>
GooglePlus: <https://plus.google.com/+bechtel>
LinkedIn: <https://www.linkedin.com/company/bechtel-corporation>
Twitter: <https://twitter.com/bechtel>
YouTube: <https://www.youtube.com/user/BechtelCorporation>

NUCLEAR WEAPONS

Bechtel is contracted to provide launch system design, construction, and integration during the next development phase for the Sentinel, the new US Ground-Based Strategic Deterrent (ICBM).¹⁶² Bechtel is part of the Lawrence Livermore National Security, LLC consortium, which has

TABLE 4: INVESTMENTS IN BECHTEL

INVESTOR	COUNTRY	LOANS	GRAND TOTAL
ANZ	Australia	\$225.0	\$225.0
Bank of America	United States	\$802.3	\$802.3
BNP Paribas	France	\$888.3	\$888.3
CIBC	Canada	\$225.0	\$225.0
Citigroup	United States	\$802.3	\$802.3
Crédit Agricole	France	\$508.3	\$508.3
Crédit Mutuel CIC Group	France	\$225.0	\$225.0
HSBC	United Kingdom	\$225.0	\$225.0
Intesa Sanpaolo	Italy	\$214.3	\$214.3
JPMorgan Chase	United States	\$439.3	\$439.3
Mitsubishi UFJ Financial	Japan	\$508.3	\$508.3
PNC Financial Services	United States	\$214.3	\$214.3
SMBC Group	Japan	\$508.3	\$508.3
Société Générale	France	\$214.3	\$214.3
GRAND TOTAL		\$6,000.0	\$6,000.0

the management and operation contract for the Lawrence Livermore National Laboratory, where the life extension program for the W80-4 cruise missile warhead and nuclear design activities for the B83 bomb, W80 warhead and W87 warhead are carried out.¹⁶³ The contract was originally awarded in May 2007, and currently runs until at least September 2026, with a potential value of over \$61.6 billion.¹⁶⁴

Bechtel is also part of Consolidated Nuclear Security, LLC, which since 2013 has been managing the Pantex Plant and the Y-12 National Security Complex under a single \$48.5 billion contract.¹⁶⁵ CNS is “fully responsible for high-hazard enriched uranium, special nuclear material (SNM), high-explosive and nuclear weapon assembly/disassembly functions.”¹⁶⁶ In July 2020, the National Nuclear Security Administration (NNSA) announced that it had ended its deal with CNS after the latter had failed to meet safety and security standards.¹⁶⁷ While a new management and operation contract for both sites was initially awarded to Nuclear Production One in November 2021¹⁶⁷, the US Department of Energy announced in May 2022 that it would terminate said contract award and instead hold two new competitions for separate contracts to manage each site, and in the meantime further extend the current contract held by CNS.¹⁶⁸ In October 2022, the contract held by CNS was formally extended with up to five years for the Y-12 National Security Complex and up to three years for the Pantex Plant.¹⁶⁹

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

5. Bharat Dynamics Limited (India)

COMPANY PROFILE

Bharat Dynamics Limited (BDL) is a Government of India Enterprise under the Ministry of Defence.¹⁷⁰ It is also traded at the NSE India (National Stock Exchange of India) and Bombay Stock Exchange.¹⁷¹ BDL produces missiles designed to deliver Indian nuclear warheads. In the financial year ending 31 March 2022, it generated revenues of ₹28.17 billion.¹⁷²

Contact

Bharat Dynamics Limited,
Corporate office, Plot No. 38-39,
TSFC Building (Near ICICI Towers), Financial District,
Gachibowli, Hyderabad,
Telangana - 500032.
Mktg@bdl-india.in

Website: <http://www.bdl-india.in/>
Facebook: <https://www.facebook.com/Bharat-Dynamics-Limited-136105196949368/>
Twitter: https://twitter.com/bharat_dynamics

TABLE 5: INVESTMENTS IN BHARAT DYNAMICS LIMITED

INVESTOR	COUNTRY	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Abu Dhabi Investment Authority	United Arab Emirates	\$17.7		\$17.7
Aditya Birla Capital	India	\$11.1		\$11.1
Dimensional Fund Advisors	United States	\$6.2		\$6.2
Elara Capital	United Kingdom		\$41.2	\$41.2
Government Pension Fund Global	Norway	\$4.8		\$4.8
HDFC Bank	India	\$175.3		\$175.3
IDBI Bank	India		\$41.2	\$41.2
Kotak Mahindra Bank	India	\$43.9		\$43.9
Life Insurance Corporation of India	India	\$82.9		\$82.9
Mahindra Finance	India	\$3.9		\$3.9
Nippon Life Insurance	Japan	\$9.2		\$9.2
Principal Financial Group	United States	\$20.0		\$20.0
Sundarm Finance Group	India	\$30.1		\$30.1
Tata Group	India	\$13.1		\$13.1
Yes Bank	India		\$41.2	\$41.2
GRAND TOTAL		\$418.2	\$123.5	\$541.7

NUCLEAR WEAPONS

BDL is the prime production agency for the Indian Integrated Guided Missile Development Programme. It is involved in several nuclear capable missile programmes, including the Prithvi and Agni systems, and provides support for life extension programmes.¹⁷³

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

6. Boeing (United States)

COMPANY PROFILE

Boeing is a manufacturer of commercial and military aircraft, satellites and weapons, among others.¹⁷⁴ Boeing supports the production of the Minuteman III and Trident II (D5) missiles and produces key components for the B61-12 gravity bombs. Boeing also has contracts related to the US Long Range Standoff missiles. In the financial year ending 31 December 2021, Boeing reported \$62.3 billion in revenues.¹⁷⁵

Contact

Boeing Corporate Offices
100 North Riverside
Chicago, Illinois 60606
+1.312.544.2000

Website: <http://www.boeing.com/>
Facebook: <https://www.facebook.com/boeing>
Instagram: <http://instagram.com/boeing>
LinkedIn: <https://www.linkedin.com/company/boeing>
Twitter: <http://www.twitter.com/Boeing>
YouTube: <http://www.youtube.com/user/Boeing>

NUCLEAR WEAPONS

Boeing remanufactured the warhead arming device for the Air launched Cruise Missiles of the US nuclear arsenal. The Air Force Nuclear Weapons Center at Tinker Air Force Base, Oklahoma contracted Boeing in 2018 to produce 266 fuse assemblies for the air launched missiles, with a potential value of \$29.4 million.¹⁷⁶

Boeing holds the contract for the guided tail-kit of the B61-12 upgrade. The total value of the contract is \$239.1 million, and work is expected to be completed by April 2024.¹⁷⁷

Boeing also has a \$250 million contract for the Long-Range Standoff weapon system. The contract includes aircraft and missile carriage equipment development and modification, engineering, testing, software development, training, facilities, and support necessary to fully integrate the Long Range Standoff Cruise Missile on the B-52H bomber platform.¹⁷⁸ Work is expected to be completed by December 2024.

Since 1958, Boeing has been responsible for the development and production of the US Minuteman Intercontinental Ballistic Missile (ICBM) systems.¹⁷⁹ Boeing

is currently contracted to provide engineering and other services for the Minuteman III under a \$767.9 million contract through 2024.¹⁸⁰ In September 2021, Boeing was awarded a potential \$1.69 billion, 18-year contract for Minuteman III missile guidance repair.¹⁸¹ Under an eight year \$21 million contract awarded in April 2022, Boeing will also produce and deliver FT3 Systems to support the operational test launch schedule for the Minuteman III.¹⁸²

Boeing holds a three-year contract, awarded in 2020, valued at \$58.8 million for maintenance, repair, and rebuilding as well as technical services in support of the navigation subsystem for the Trident II (D5) missile system.¹⁸³

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 6: INVESTMENTS IN BOEING

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Academy Securities	United States				\$171.0	\$171.0
ANZ	Australia		\$288.3		\$252.2	\$540.5
Apto Partners	United States				\$38.1	\$38.1
Arab Banking Corporation (Bank ABC)	Bahrain		\$88.3			\$88.3
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$900.2		\$879.1	\$1,779.3
Bancroft Capital (PA)	United States				\$17.8	\$17.8
Bancroft Group (CT)	United States				\$20.3	\$20.3
Bank of America	United States		\$2,651.4	\$1,200.9	\$3,764.9	\$7,617.3
Bank of China	China		\$708.5			\$708.5
Bank of New York Mellon	United States		\$88.3			\$88.3
Barclays	United Kingdom		\$732.2		\$252.2	\$984.3
BayernLB	Germany		\$108.5			\$108.5
BlackRock	United States			\$4,830.7		\$4,830.7
Blaylock Beal Van	United States				\$38.1	\$38.1
BMO Financial Group	Canada		\$300.0	\$884.6		\$1,184.6
BNP Paribas	France		\$1,911.2		\$2,085.4	\$3,996.6
Cabrera Capital	United States				\$38.1	\$38.1
Canara Bank	India		\$10.0			\$10.0
Capital Group	United States			\$850.3		\$850.3
CastleOak Securities	United States				\$38.1	\$38.1
Charles Schwab	United States			\$539.0		\$539.0
Citigroup	United States		\$6,928.7		\$3,748.8	\$10,677.5
CL King & Associates	United States				\$38.1	\$38.1
Commerzbank	Germany		\$1,190.2		\$1,147.7	\$2,337.8
Crédit Agricole	France		\$1,441.9		\$1,128.6	\$2,570.6
Credit Suisse	Switzerland		\$553.7		\$621.7	\$1,175.4
DBS	Singapore		\$810.3			\$810.3
Deutsche Bank	Germany		\$2,000.5		\$2,085.4	\$4,085.9
Drexel Hamilton	United States				\$38.1	\$38.1
Fidelity Investments	United States			\$2,584.4		\$2,584.4
First Abu Dhabi Bank	United Arab Emirates		\$241.8			\$241.8
Geode Capital Holdings	United States			\$1,697.1		\$1,697.1
Goldman Sachs	United States		\$1,257.0		\$2,337.6	\$3,594.5
Government Pension Investment Fund (GPIF)	Japan			\$880.7		\$880.7
Great Pacific Securities	United States				\$38.1	\$38.1
Groupe BPCE	France		\$194.9	\$2,440.0		\$2,634.9
Guzman & Co	United States				\$38.1	\$38.1
ICICI Bank	India		\$277.8			\$277.8
IFS Group	United States				\$19.0	\$19.0
Industrial and Commercial Bank of China	China		\$208.5		\$159.4	\$367.9
Intesa Sanpaolo	Italy		\$168.3		\$252.2	\$420.5
Japan Mutual Aid Association of Public School Teachers	Japan			\$868.1		\$868.1
JPMorgan Chase	United States		\$4,200.4		\$3,603.8	\$7,804.2
La Caixa Group	Spain		\$110.7			\$110.7
Legal & General	United Kingdom			\$536.5		\$536.5

Lloyds Banking Group	United Kingdom		\$308.5		\$159.4	\$467.9
Loop Capital	United States				\$171.0	\$171.0
MBS	United States				\$38.1	\$38.1
MFR	United States				\$38.1	\$38.1
Mischler Financial Group	United States				\$38.1	\$38.1
Mitsubishi UFJ Financial	Japan		\$1,290.5		\$1,062.5	\$2,352.9
Mizuho Financial	Japan		\$2,035.8		\$2,085.4	\$4,121.2
Morgan Stanley	United States		\$1,416.8	\$858.9	\$2,337.6	\$4,613.3
Newport Group	United States			\$8,332.2		\$8,332.2
Northern Trust	United States		\$293.4	\$654.3		\$947.7
Penserra Capital Management	United States				\$38.1	\$38.1
PNC Financial Services	United States		\$440.0		\$230.2	\$670.2
R. Seelaus & Co	United States				\$55.0	\$55.0
Riyad Bank	Saudi Arabia		\$525.4			\$525.4
Royal Bank of Canada	Canada		\$1,800.5		\$2,085.4	\$3,885.9
Santander	Spain		\$973.7		\$889.4	\$1,863.1
SAR Holdings	United States				\$38.1	\$38.1
Schweizerische Nationalbank	Switzerland			\$463.1		\$463.1
Shank Williams Cisneros & Co	United States				\$100.3	\$100.3
SMBC Group	Japan		\$2,000.5		\$2,085.4	\$4,085.9
Société Générale	France		\$1,085.3		\$879.1	\$1,964.3
Standard Chartered	United Kingdom		\$338.3		\$252.2	\$590.5
State Bank of India	India		\$288.3			\$288.3
State Street	United States		\$183.3	\$5,094.4		\$5,277.7
Stern Brothers & Co	United States				\$38.1	\$38.1
T. Rowe Price	United States			\$855.0		\$855.0
Telsey Advisory Group	United States				\$38.1	\$38.1
TIAA	United States			\$776.3		\$776.3
Tribal Capital Markets	United States				\$38.1	\$38.1
Truist Financial	United States		\$100.0		\$159.4	\$259.4
UBS	Switzerland		\$30.2	\$435.7		\$465.9
US Bancorp	United States		\$385.3		\$159.4	\$544.7
Vanguard	United States	\$388.1		\$8,302.7		\$8,690.8
Wells Fargo	United States		\$2,840.8		\$3,603.8	\$6,444.6
Westpac	Australia		\$602.1		\$252.2	\$854.3
GRAND TOTAL		\$388.1	\$44,310.2	\$43,084.9	\$39,725.0	\$127,508.2

7. China Aerospace Science and Technology (CASC)

COMPANY PROFILE

China Aerospace Science and Technology (CASC) is part of China's state-owned (aero)space and defence industry.¹⁸⁴ The company has eight large R&D and production complexes, 11 specialized companies, 13 listed companies and a number of directly affiliated units. It is engaged in space products and strategic and tactical missile systems. CASC is the only broadcast and communications satellite operator in China.¹⁸⁵ CASC generated \$38.7 billion in revenue in 2021.¹⁸⁶

Contact

16 Fucheng Road,
Haidian District,
Beijing 100048,
China
+86 (0)10-68767492

Website: <http://english.spacechina.com/n16421/index.html>

E-mail: casc@spacechina.com

NUCLEAR WEAPONS

China is developing new types of intermediate and long-range ballistic missiles for its nuclear arsenal, notably the DF-26.¹⁸⁷ CASC states that it is the only manufacturer of intercontinental strategic nuclear missiles in China.¹⁸⁸

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 7: INVESTMENTS IN CASC

INVESTOR	COUNTRY	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
China Jianyin Investment	China	\$26.4		\$26.4
China Merchants Bank	China	\$15.0	\$1,020.9	\$1,035.8
China Southern Asset Management (CSAM)	China	\$25.5		\$25.5
Donghai Securities	China		\$66.7	\$66.7
First Capital Securities	China		\$45.0	\$45.0
First Seafont Fund Management	China	\$14.0		\$14.0
Fullgoal Fund Management	China	\$38.3		\$38.3
GF Securities	China	\$26.1		\$26.1
Hankou Bank	China		\$66.7	\$66.7
Hubei Bank	China		\$66.7	\$66.7
Hubei Juyuan Technology Investment	China	\$64.1		\$64.1
People's Insurance Company	China	\$97.6		\$97.6
Shenwan Hongyuan Group	China		\$66.7	\$66.7
GRAND TOTAL		\$307.0	\$1,332.8	\$1,639.8

8. Constructions Industrielles de la Méditerranée (CNIM) (France)

COMPANY PROFILE

CNIM is a French equipment manufacturer and industrial contractor. It supplies products and services to major public and private sector organizations, local authorities and national governments in the energy, military, and high technology markets.¹⁸⁹ CNIM Systèmes Industriels (CSI) produces key components for the submarine launched nuclear missiles in the French arsenal.¹⁹⁰ In the financial year ending 31 December 2020, CNIM reported revenues of € 632.9 million.¹⁹¹ At the moment of writing, 2021 results have not yet been published.

In September 2022, Groupe REEL completed its acquisition of CNIM Systèmes Industriels.¹⁹² Groupe REEL is an industrial group specializing in complex lifting and handling equipments as well as integrated systems solutions.¹⁹³ It has designed specific equipment for the assembly and loading of missiles for strategic nuclear submarines.¹⁹⁴

Contact

Head Office and General Management
Le Viking, 67, rue Anatole France
92300 Levallois-Perret
Tel. : +33 (0)1 44 31 11 00E-mail: contact@cnim.com

Website : <https://cnim.com/en/group>

LinkedIn : <https://fr.linkedin.com/company/cnim>

Twitter: https://twitter.com/cnim_group

YouTube: <https://www.youtube.com/GroupeCNIM>

TABLE 8: INVESTMENTS IN CONSTRUCTIONS INDUSTRIELLES DE LA MÉDITERRANÉE (CNIM)

INVESTOR	COUNTRY	SHAREHOLDING	GRAND TOTAL
Quaero Capital	Switzerland	\$0.9	\$0.9
GRAND TOTAL		\$0.9	\$0.9

NUCLEAR WEAPONS

CNIM states that it is “a major player in French deterrence programs since 1961”¹⁹⁵ CNIM Systèmes Industriels (CSI) is the sole supplier of missile launch systems for nuclear submarines and does the M51 missile integration.¹⁹⁶

Testing nuclear weapons

In 1996 France ended full scale explosive nuclear testing and instead launched the Laser Mégajoule project (LMJ) “to extend the life of its nuclear deterrent by simulating explosions of nuclear weapons”.¹⁹⁷ The nuclear test simulations are managed by CEA/DAM (Military Applications Directorate of France’s Atomic and Alternative Energy Authority).¹⁹⁸ CNIM states that it has been involved since 1999 with the manufacture of high-precision mechanical and optical devices for the LMJ.¹⁹⁹ The Laser Mégajoule is designed to “validate theoretical models of nuclear weapon detonations, and therefore plays an important role in France’s nuclear simulation program”.²⁰⁰

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

9. Fluor (United States)

COMPANY PROFILE

Fluor, based in the United States, provides complex engineering, procurement, construction, and maintenance projects for commercial and government clients.²⁰¹ Fluor provides support to the US Department of Energy and National Nuclear Security Administration that includes management, mission operations, environmental remediation, decommissioning, engineering and construction services at legacy and operational nuclear sites. In the year ending December 2021, Fluor reported \$12.4 billion in revenue.²⁰²

Contact

Fluor Corporation
6700 Las Colinas Blvd Irving, TX 75039 USA.
Tel: +1.469.398.7000

Website: <https://www.fluor.com/>

Facebook: <https://www.facebook.com/FluorCorp/>

LinkedIn: <https://www.linkedin.com/company/fluor>

Twitter: <https://twitter.com/fluorcorp>

YouTube: <https://www.youtube.com/user/FluorCorporation>

NUCLEAR WEAPONS

Fluor is the lead partner in Savannah River Nuclear Solutions (SRNS), a joint venture with Honeywell and Stoller Newport News Nuclear (SN3, part of Huntington Ingalls).²⁰³ Since 2008, SRNS remains responsible for the management and operation of the Department of Energy's Savannah River Site and Savannah River National Laboratory, which produces nuclear components for nuclear weapons.²⁰⁴ The contract²⁰⁵ with a potential value of \$18 billion²⁰⁶ was extended in September 2022 by five more years.²⁰⁷

In November 2021, Nuclear Production One, a joint venture between Amentum and Fluor, was awarded the contract to manage and operate the Y-12 National Security Complex and the Pantex Plant,²⁰⁸ However, this contract award was terminated in May 2022 when the US Department of Energy announced it would hold two new competitions for separate contracts to manage each site.²⁰⁹

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 9: INVESTMENTS IN FLUOR

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Allianz	Germany			\$55.6		\$55.6
American National Insurance	United States	\$14.3				\$14.3
Auto-Owners Insurance	United States	\$14.6				\$14.6
Bank of America	United States		\$1,300.0	\$23.1	\$98.6	\$1,421.7
Bank of New York Mellon	United States			\$212.5		\$212.5
BlackRock	United States	\$28.5		\$453.0		\$481.5
BMO Financial Group	Canada		\$225.0		\$16.4	\$241.4
BNP Paribas	France		\$1,300.0		\$98.6	\$1,398.6
Boston Private	United States			\$96.9		\$96.9
Charles Schwab	United States			\$40.3		\$40.3
Cincinnati Financial	United States	\$15.0				\$15.0
Citadel	United States			\$34.0		\$34.0
Citigroup	United States		\$716.7		\$98.6	\$815.2
Comerica	United States		\$100.0		\$16.4	\$116.4
Dimensional Fund Advisors	United States			\$46.7		\$46.7
Fidelity Investments	United States			\$283.8		\$283.8
Fifth Third Bancorp	United States		\$125.0			\$125.0
Franklin Resources	United States			\$53.8		\$53.8
Geode Capital Holdings	United States			\$71.4		\$71.4

Goldman Sachs	United States		\$100.0		\$16.4	\$116.4
Granite Investment Partners	United States			\$33.0		\$33.0
Hotchkis & Wiley Capital Management	United States			\$185.3		\$185.3
ING Group	Netherlands		\$291.7			\$291.7
Knights of Columbus	United States	\$10.0				\$10.0
Lazard	Bermuda			\$44.8		\$44.8
Lord, Abnett & Co	United States	\$56.8				\$56.8
Masters Capital Management	United States			\$28.7		\$28.7
Millennium Management	United States			\$25.6		\$25.6
Mitsubishi UFJ Financial	Japan		\$1,125.0		\$16.4	\$1,141.4
Modern Woodmen of America	United States	\$10.0				\$10.0
Morgan Stanley	United States			\$73.8		\$73.8
Nierenberg Investment Management	United States			\$22.2		\$22.2
Northern Trust	United States			\$48.2		\$48.2
OneAmerica Asset Management	United States	\$14.0				\$14.0
Regions Financial	United States		\$516.7		\$16.4	\$533.1
Renaissance Technologies	United States			\$30.9		\$30.9
Royal Bank of Canada	Canada		\$50.0			\$50.0
Rubic Capital Management	United States			\$93.4		\$93.4
SMBC Group	Japan		\$225.0		\$16.4	\$241.4
Standard Bank	South Africa		\$50.0			\$50.0
Standard Chartered	United Kingdom		\$200.0		\$16.4	\$216.4
State Farm	United States	\$55.7				\$55.7
State Street	United States			\$136.5		\$136.5
TIAA	United States			\$22.3		\$22.3
Two Sigma Investments	United States			\$78.5		\$78.5
US Bancorp	United States		\$200.0		\$16.4	\$216.4
Van Eck Associates Corporation	United States	\$30.5				\$30.5
Vanguard	United States			\$380.8		\$380.8
Wellington Management	United States			\$385.9		\$385.9
Wells Fargo	United States		\$425.0		\$98.6	\$523.6
GRAND TOTAL		\$249.2	\$6,950.0	\$2,961.0	\$525.6	\$10,685.8

10. General Dynamics (United States)

COMPANY PROFILE

General Dynamics is an aerospace and military company. It produces business jets, combat vehicles, command and control systems and nuclear submarines.²¹⁰ General Dynamics is involved in producing components for the US and UK Trident II (D5) nuclear-armed submarine-launched ballistic missiles. In the financial year ending 31 December 2021, General Dynamics reported revenues of \$ 38.5 billion.²¹¹

Contact

General Dynamics
11011 Sunset Hills Road
Reston, Virginia 20190
+1.703.876.3000

Website: <http://www.gd.com/>

LinkedIn: <https://www.linkedin.com/company/general-dynamics/>

Twitter: <https://twitter.com/generaldynamics>

NUCLEAR WEAPONS

General Dynamics is responsible for integrating Trident nuclear weapons for the US Columbia-class program and the UK Dreadnought-class submarines.²¹² In October 2022, General Dynamics was awarded a \$18.1 million contract to provide US Trident II Strategic Weapon System Kings

Bay Trident Trainer Facility kit and engineering support services.²¹³ While General Dynamics receives contracts through the US contract system, sometimes this is for work only on UK weapons. An example of this is a \$64.8 million six-year contract, awarded in 2019, for the Strategic Weapon System Fire Control Subsystem hardware, associated deliverables, and spares for the second hull of the UK Dreadnought Class ballistic missile submarines.²¹⁴

General Dynamics Mission Systems has a \$339.1 million contract for US and UK Trident II (D-5) Fleet Ballistic Missile Submarines Fire Control System and other support through December 2024.²¹⁵ In July 2022, General Dynamics Mission Systems was awarded a second contract to support development, production and installation of fire control systems for the Columbia and Dreadnought ballistic missile submarine classes.²¹⁶ The contract is valued at \$272.9 million and work is expected to be completed in June 2028.²¹⁷

General Dynamics is also part of the Northrop Grumman Ground Based Strategic Deterrent (GBSD) team, working on command-and-control systems for these new US nuclear missiles.²¹⁸

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 10: INVESTMENTS IN GENERAL DYNAMICS

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Academy Securities	United States				\$62.5	\$62.5
ANZ	Australia		\$210.9			\$210.9
Apple Financial Holdings	United States		\$67.0			\$67.0
Aristotle Capital Management	United States			\$1,018.8		\$1,018.8
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$710.9		\$535.0	\$1,245.9
Banco de Crédito e Inversiones	Chile		\$19.7			\$19.7
Bank of America	United States		\$2,205.3	\$1,965.8	\$865.0	\$5,036.1
Bank of East Asia	Hong Kong		\$25.8			\$25.8
Bank of New York Mellon	United States		\$173.3			\$173.3
BlackRock	United States			\$2,641.7		\$2,641.7
Blaylock Beal Van	United States				\$35.0	\$35.0
Capital Group	United States			\$2,468.1		\$2,468.1
Capital One Financial	United States		\$218.5			\$218.5
Cathay General Bancorp	United States		\$8.1			\$8.1
Chang Hwa Commercial Bank	Taiwan		\$20.1			\$20.1

Citigroup	United States		\$150.1			\$150.1
Citizens Financial Group	United States		\$73.6			\$73.6
Crédit Mutuel CIC Group	France		\$166.3			\$166.3
Drexel Hamilton	United States				\$35.0	\$35.0
Fidelity Investments	United States			\$677.7		\$677.7
Fifth Third Bancorp	United States		\$245.3			\$245.3
First Abu Dhabi Bank	United Arab Emirates		\$210.9			\$210.9
First Financial Holding	Taiwan		\$32.1			\$32.1
First Trust Advisors	United States			\$353.1		\$353.1
Franklin Resources	United States			\$483.4		\$483.4
Fuyo General Lease	Japan		\$156.7			\$156.7
Geode Capital Holdings	United States			\$910.4		\$910.4
Goldman Sachs	United States		\$150.1			\$150.1
Government Pension Fund Global	Norway			\$473.2		\$473.2
Groupe BPCE	France			\$469.8		\$469.8
Hua Nan Financial	Taiwan		\$12.9			\$12.9
Iberia Bank	United States		\$20.1			\$20.1
Invesco	United States			\$430.6		\$430.6
Janus Henderson	United Kingdom			\$495.7		\$495.7
JPMorgan Chase	United States		\$1,135.6	\$1,393.4	\$785.0	\$3,314.0
Lloyds Banking Group	United Kingdom		\$486.0		\$315.0	\$801.0
Mega Financial	Taiwan		\$26.9			\$26.9
Mitsubishi UFJ Financial	Japan		\$1,018.6		\$315.0	\$1,333.6
Mizuho Financial	Japan		\$1,135.6		\$495.0	\$1,630.6
Newport Group	United States			\$4,092.7		\$4,092.7
Northern Trust	United States		\$543.0	\$355.0		\$898.0
Northwestern Mutual	United States	\$75.0				\$75.0
Orix Corporation	Japan			\$516.6		\$516.6
People's United Financial	United States		\$40.2			\$40.2
PNC Financial Services	United States		\$456.2		\$85.0	\$541.2
Prudential Financial (US)	United States	\$62.3				\$62.3
Raven's Wing Asset Management	United States			\$7,245.7		\$7,245.7
Raymond James Financial	United States		\$27.5			\$27.5
Regions Financial	United States		\$207.8			\$207.8
Royal Bank of Canada	Canada		\$973.9	\$553.8	\$495.0	\$2,022.7
Scotiabank	Canada		\$573.9		\$172.5	\$746.4
SMBC Group	Japan		\$456.2		\$227.5	\$683.7
State Bank of India	India		\$80.4			\$80.4
State Street	United States			\$2,567.4		\$2,567.4
Stifel Financial	United States		\$3.9	\$330.5		\$334.4
Sun Life Financial	Canada			\$522.4		\$522.4
Toronto-Dominion Bank	Canada		\$338.2		\$62.5	\$400.7
Truist Financial	United States		\$245.3			\$245.3
Union Bankshares	United States		\$6.8			\$6.8
US Bancorp	United States		\$456.2		\$70.0	\$526.2
Vanguard	United States			\$4,902.3		\$4,902.3
Wellington Management	United States			\$3,968.9		\$3,968.9
Wells Fargo	United States		\$1,857.6	\$1,456.5	\$945.0	\$4,259.1
Woodforest National Bank	United States		\$33.4			\$33.4
GRAND TOTAL		\$137.3	\$14,981.0	\$40,293.5	\$5,500.0	\$60,911.9

11. Honeywell International (United States)

COMPANY PROFILE

Honeywell International is involved in aerospace, building technologies, performance materials & technologies, and safety & productivity solutions.²¹⁹ The company builds key components for the US nuclear arsenal and is also involved in management and operations of several US nuclear weapon production facilities. In the financial year ending 31 December 2021, Honeywell International announced sales of \$34,392 million.²²⁰

Contact

Honeywell International
300 S Tryon St Suite 500,
Charlotte, NC 28202,
United States

Website: <https://www.honeywell.com/>
Facebook: <https://www.facebook.com/honeywell>
Instagram: <https://www.instagram.com/honeywell>
LinkedIn: <https://www.linkedin.com/company/honeywell>
Twitter: <https://twitter.com/honeywell>
YouTube: <https://www.youtube.com/user/honeywell>

NUCLEAR WEAPONS

Honeywell will work on guidance and missile electronics in developing the Sentinel, the new US ICBM, also known as the Ground Based Strategic Deterrent.²²¹

Honeywell is the original equipment manufacturer of the Pendulous Integrating Gyroscopic Accelerometer guidance instrument for the Minuteman III, and identified as the only possible producer of this key nuclear missile component. The current contract has a potential value of \$88.5 million and will run through at least October 2023.²²² In March 2022, Honeywell was awarded a six-year \$74.1 million contract for its repair.²²³

Honeywell states it has been supporting US national security goals “since the dawn of the nuclear age”.²²⁴ Today, Honeywell operates four sites for the US Department of Energy and the National Nuclear Security Administration through joint-venture partnerships: Kansas City National Security Campus, Nevada National Security Site, Sandia National Laboratory and Savannah River Site.²²⁵

Since 2015, Honeywell Federal Solutions has been managing and operating the National Security Campus (NSC) (formerly Kansas City Plant), the facility responsible for producing an estimated 85%²²⁶ of the non-nuclear components for US nuclear weapons, including electronic, chemical and engineered material components.²²⁷ This includes production of the gas transfer system and the arming, fuzing, and firing subsystem of the W88 Alt 370 warhead for the Trident II submarine-launched ballistic missiles.²²⁸ The 10-year contract has a potential value of \$13.7 billion.²²⁹

Sandia National Laboratory is directly involved in the nuclear weapon modernisation programmes of at least the W88 Alt 37 warhead²³⁰ and the W76-1 warhead²³¹ (both used for arming the submarine-launched Trident II (D5) missiles), the new W80-4 warheads for the Long Range Standoff missiles²³², and the new B61-12 gravity bomb.²³³ National Technology and Engineering Solutions of Sandia (NTES), a “wholly-owned subsidiary” of Honeywell, has the management and operations contract. The contract, with a potential total value of \$43.3 billion, runs until April 2027.²³⁴ Northrop Grumman and Universities Research Association²³⁵ support NTES in the performance of this contract.²³⁶

Fluor is the lead partner in Savannah River Nuclear Solutions (SRNS), a joint venture with Honeywell and Stoller Newport News Nuclear (SN3, part of Huntington Ingalls)²³⁷ that operates the Savannah River Site, where plutonium and tritium are processed for nuclear warheads.²³⁸ In September 2022, SRNS received a five-year contract extension for this work, with a potential value of \$12 billion.²³⁹

Together with Jacobs Engineering Group Inc., and Huntington Ingalls International subsidiary HII Nuclear Inc., Honeywell is part of the Mission Support and Test Service (MSTS) consortium that manages and operates the US Nevada National Security Site. The site is used for tests that “provide data relevant to improving our predictive capability and for certification of the current and future stockpile”²⁴⁰ MSTS is also contracted for producing nuclear weapon “components (primary, secondary, non-nuclear)” as well as “strategic materials capabilities and productions”.²⁴¹ The consortium was awarded a 10 year contract in 2017, with a potential value of \$9.2 billion.²⁴²

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 11: INVESTMENTS IN HONEYWELL INTERNATIONAL

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Academy Securities	United States				\$40.0	\$40.0
Ameriprise Financial	United States			\$1,276.4		\$1,276.4
ANZ	Australia		\$443.3			\$443.3
Aristotle Capital Management	United States			\$1,115.5		\$1,115.5
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$418.9		\$60.0	\$478.9
Bank of America	United States		\$1,873.8	\$3,824.8	\$672.5	\$6,371.1
Bank of China	China		\$443.3			\$443.3
Bank of New York Mellon	United States			\$680.3		\$680.3
Barclays	United Kingdom		\$797.3		\$299.3	\$1,096.5
BayernLB	Germany		\$116.0			\$116.0
BlackRock	United States			\$5,714.7		\$5,714.7
BNP Paribas	France		\$768.9		\$564.3	\$1,333.2
Capital Group	United States			\$2,586.8		\$2,586.8
CIBC	Canada		\$443.3			\$443.3
Citigroup	United States		\$3,494.6		\$672.5	\$4,167.1
Crédit Agricole	France		\$354.9		\$95.0	\$449.9
Danske Bank	Denmark		\$214.2			\$214.2
DBS	Singapore		\$374.9			\$374.9
Deutsche Bank	Germany		\$1,829.8		\$828.8	\$2,658.6
Franklin Resources	United States			\$1,033.0		\$1,033.0
Geode Capital Holdings	United States			\$2,288.3		\$2,288.3
Goldman Sachs	United States		\$1,726.7		\$1,010.5	\$2,737.2
Government Pension Investment Fund (GPIF)	Japan			\$1,279.0		\$1,279.0
HSBC	United Kingdom		\$374.9		\$20.0	\$394.9
Industrial and Commercial Bank of China	China		\$374.9		\$20.0	\$394.9
Intesa Sanpaolo	Italy		\$116.0			\$116.0
Janus Henderson	United Kingdom			\$729.4		\$729.4
Japan Mutual Aid Association of Public School Teachers	Japan			\$1,109.7		\$1,109.7
JPMorgan Chase	United States		\$1,971.8		\$672.5	\$2,644.3
Lazard	Bermuda			\$920.7		\$920.7
Legal & General	United Kingdom			\$908.8		\$908.8
Mitsubishi UFJ Financial	Japan		\$991.6			\$991.6
Mizuho Financial	Japan		\$1,407.5		\$828.8	\$2,236.2
Morgan Stanley	United States		\$1,033.3	\$2,156.5	\$828.8	\$4,018.5
NatWest	United Kingdom		\$604.1		\$20.0	\$624.1
Newport Group	United States			\$3,258.3		\$3,258.3
Northern Trust	United States		\$374.9	\$858.9		\$1,233.8

Royal Bank of Canada	Canada		\$374.9		\$20.0	\$394.9	
Santander	Spain		\$938.1		\$285.0	\$1,223.1	
Scotiabank	Canada		\$254.9			\$254.9	
SMBC Group	Japan		\$1,407.5		\$672.5	\$2,080.0	
Société Générale	France		\$718.9		\$255.0	\$973.9	
Standard Chartered	United Kingdom		\$374.9		\$20.0	\$394.9	
State Farm	United States	\$165.0				\$165.0	
State Street	United States				\$6,558.9	\$6,558.9	
Sun Life Financial	Canada				\$3,925.6	\$3,925.6	
T. Rowe Price	United States				\$1,393.0	\$1,393.0	
TIAA	United States				\$921.3	\$921.3	
Toronto-Dominion Bank	Canada		\$768.9		\$285.0	\$1,053.9	
UBS	Switzerland				\$686.0	\$686.0	
UniCredit	Italy		\$708.9		\$564.3	\$1,273.2	
US Bancorp	United States		\$643.9		\$210.0	\$853.9	
Vanguard	United States				\$11,581.3	\$11,581.3	
Wellington Management	United States				\$2,857.1	\$2,857.1	
Wells Fargo	United States		\$1,873.8		\$672.5	\$2,546.3	
Westpac	Australia		\$386.4			\$386.4	
GRAND TOTAL			\$165.0	\$29,000.0	\$57,664.5	\$9,617.1	\$96,446.6

12. Huntington Ingalls Industries (United States)

COMPANY PROFILE

Huntington Ingalls Industries (HII), designs, constructs and maintains nuclear and non-nuclear ships for the US Navy and Coast Guard and provides other services including nuclear and environmental services.²⁴³ The company is involved in several facilities involved in the production, development and stockpiling of US nuclear weapons. In the financial year ending 31 December 2021, HII generated revenues of \$ 9.5 billion.²⁴⁴

Contact

Huntington Ingalls Industries
4101 Washington Ave.
Newport News, VA 23607
Telephone: +1 (757) 380-2000

Website: <https://www.huntingtoningalls.com/>

Facebook: <http://www.facebook.com/HuntingtonIngallsIndustries>

HuntingtonIngallsIndustries

Instagram: <https://www.instagram.com/huntingtoningalls/>

LinkedIn: <https://www.linkedin.com/company/huntingtoningalls>

huntingtoningalls

Twitter: <https://twitter.com/hiindustries>

YouTube: <https://www.youtube.com/c/huntingtoningalls>

NUCLEAR WEAPONS

The Los Alamos National Laboratory is responsible for the nuclear design and engineering and life extension programmes for US nuclear warheads.²⁴⁵ As a subcontractor of the joint venture Triad National Security²⁴⁶, Huntington Ingalls Industries provides “personnel, systems, tools and corporate reachback in the areas of pit production, plutonium manufacturing, production scale-up and nuclear operations and manufacturing” for the Los Alamos Laboratory.²⁴⁷ The contract has a potential value of \$27.8 billion and is expected to run until at least October 2028.²⁴⁸

Formerly known as the Nevada Test Site, the Nevada National Security Site maintains facilities related to nuclear weapon modernisation and stockpiling. It retains the capability to resume full- scale nuclear testing within a couple years, at the discretion of the US President.²⁴⁹ Mission Support and Test Services LLC (MSTS) manages and operates the site. MSTS is a limited liability company

consisting of Honeywell International Inc., Jacobs Engineering Group Inc., and Stoller Newport News Nuclear, Inc. (SN3, part of HII).²⁵⁰ The ten-year contract is worth \$9,2 billion and is set to expire in November 2027.²⁵¹

Through SN3, HII is also involved in the joint venture managing and operating of the Savannah River Site and Savannah River National Laboratory, which produces nuclear components for nuclear weapons.²⁵² In September 2022, this contract was extended with another five years, with a potential value of \$12 billion.²⁵³

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

Table 12: Investments in Huntington Ingalls Industries

TABLE 12: INVESTMENTS IN HUNTINGTON INGALLS INDUSTRIES

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Affiliated Managers Group	United States			\$62.2		\$62.2
Allianz	Germany	\$50.8				\$50.8
American Century Investments	United States			\$53.1		\$53.1
American Equity	United States	\$16.0				\$16.0
AQR Capital Management	United States			\$98.7		\$98.7
Baird	United States	\$84.1				\$84.1
Balyasny Asset Management	United States			\$63.2		\$63.2
Bank of America	United States		\$422.9	\$181.5	\$300.0	\$904.4
Bank of New York Mellon	United States			\$67.6		\$67.6
BlackRock	United States			\$978.5		\$978.5
California Public Employees' Retirement System (CalPERS)	United States	\$46.0				\$46.0
Capital One Financial	United States		\$118.8		\$35.0	\$153.8
Charles Schwab	United States			\$67.1		\$67.1
Citadel	United States			\$99.3		\$99.3
Clark Capital Management Group	United States	\$19.3				\$19.3
Comerica	United States		\$66.7			\$66.7
Congress Asset Management Company	United States			\$92.7		\$92.7
Cooke & Bieler	United States			\$93.1		\$93.1
Dimensional Fund Advisors	United States			\$73.9		\$73.9
Federated Investors	United States	\$19.8				\$19.8
Fidelity Investments	United States			\$354.7		\$354.7
Fifth Third Bancorp	United States		\$66.7			\$66.7
First Horizon	United States		\$235.4		\$10.0	\$245.4
Franklin Resources	United States			\$45.4		\$45.4
Geode Capital Holdings	United States			\$153.5		\$153.5
Government Pension Investment Fund (GPIF)	Japan			\$66.1		\$66.1
Hancock Whitney	United States		\$183.3		\$10.0	\$193.3
Hoover Financial Advisors	United States			\$57.9		\$57.9
Invesco	United States			\$142.3		\$142.3
Jacobs Levy Equity Management	United States			\$50.6		\$50.6
Japan Mutual Aid Association of Public School Teachers	Japan			\$65.8		\$65.8
JPMorgan Chase	United States		\$422.9		\$440.0	\$862.9
Jupiter Fund Management	United Kingdom			\$51.3		\$51.3
KKR Group	United States		\$248.9			\$248.9
Legal & General	United Kingdom			\$52.3		\$52.3
Lord, Abnett & Co	United States	\$26.7				\$26.7
LSV Asset Management	United States			\$234.3		\$234.3
Manulife Financial	Canada	\$118.1				\$118.1
MetLife	United States	\$18.0				\$18.0
Mitsubishi UFJ Financial	Japan		\$235.4		\$100.0	\$335.4
Mizuho Financial	Japan		\$422.9		\$300.0	\$722.9

Morgan Stanley	United States			\$162.0		\$162.0
Nationwide Mutual Insurance	United States	\$91.1				\$91.1
Northern Trust	United States			\$52.8		\$52.8
Pacific Mutual	United States	\$20.0				\$20.0
Pendal Group	Australia			\$67.0		\$67.0
PNC Financial Services	United States		\$118.8		\$35.0	\$153.8
Prudential Plc	United Kingdom	\$17.5				\$17.5
Scotiabank	Canada		\$422.9		\$100.0	\$522.9
State Street	United States			\$631.6		\$631.6
Thornburg Investment Management	United States	\$17.7				\$17.7
TIAA	United States	\$51.9				\$51.9
Toronto-Dominion Bank	Canada		\$118.8		\$35.0	\$153.8
Truist Financial	United States		\$118.8		\$35.0	\$153.8
UBS	Switzerland		\$359.5			\$359.5
US Bancorp	United States		\$422.9		\$300.0	\$722.9
Vanguard	United States	\$191.0		\$912.1		\$1,103.0
Veritas Capital Fund Management	United States		\$110.6			\$110.6
Virtus Investment Partners	United States	\$16.5				\$16.5
Wedge Capital Management	United States			\$45.9		\$45.9
Wells Fargo	United States		\$422.9		\$300.0	\$722.9
Westchester	United States			\$63.4		\$63.4
GRAND TOTAL		\$804.6	\$4,519.1	\$5,140.0	\$2,000.0	\$12,463.6

13. Jacobs Engineering (United States)

COMPANY PROFILE

Jacobs Engineering Group, based in the United States, provides services including consulting, technical, scientific and project delivery for the government and private sector.²⁵⁴ Jacobs Engineering completed its acquisition of another nuclear weapon component producer, CH2M Hill, in 2017.²⁵⁵ In the financial year ending 27 September 2021, Jacobs Engineering generated revenues of \$14.1 billion.²⁵⁶

Contact

1999 Bryan Street, Ste. 1200
Dallas, TX 75201 USA
+1.214.583.8500

Website: <http://www.jacobs.com/>
Facebook: <https://www.facebook.com/JacobsConnects/>
Instagram: <https://www.instagram.com/jacobsconnects/>
LinkedIn: <https://www.linkedin.com/company/jacobs/>
Twitter: <https://twitter.com/JacobsConnects>
YouTube: <https://www.youtube.com/user/jacobsworldwide>

NUCLEAR WEAPONS

Formerly known as the Nevada Test Site, the Nevada National Security Site maintains facilities related to nuclear weapon modernisation and stockpiling. It retains the capability to resume full-scale nuclear testing within a couple years, at the discretion of the US President.²⁵⁷ Mission Support and Test Services LLC (MSTS) manages and operates the site. MSTS is a limited liability company consisting of Honeywell International Inc., Jacobs Engineering Group Inc., and Stoller Newport News Nuclear, Inc. (part of Huntington Ingalls Industries).²⁵⁸ The ten-year contract is worth \$9.2 billion and is set to expire in November 2027.²⁵⁹

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 13: INVESTMENTS IN JACOBS ENGINEERING

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	GRAND TOTAL
Aegon	Netherlands	\$60.0			\$60.0
Allspring Global Investments	United States			\$310.5	\$310.5
American Century Investments	United States			\$138.7	\$138.7
American Equity	United States	\$42.0			\$42.0
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$134.5		\$134.5
Bank of America	United States		\$460.0	\$111.4	\$571.4
Barclays	United Kingdom		\$59.2		\$59.2
BlackRock	United States	\$6.5		\$832.2	\$838.7
BMO Financial Group	Canada		\$134.5		\$134.5
BNP Paribas	France		\$743.8		\$743.8
Capital Group	United States			\$1,570.5	\$1,570.5
Charles Schwab	United States			\$134.3	\$134.3
CI Financial	Canada			\$96.3	\$96.3
Citizens Financial Group	United States		\$134.5		\$134.5
Desjardins Group	Canada	\$2.8			\$2.8
Deutsche Bank	Germany	\$5.0			\$5.0
Dimensional Fund Advisors	United States			\$139.3	\$139.3
Empyrean Capital Partners	United States			\$153.4	\$153.4
Equitable Holdings	United States			\$144.2	\$144.2

Fiera Capital	Canada	\$12.1			\$12.1
Findlay Park Partners	United Kingdom			\$336.2	\$336.2
Franklin Resources	United States	\$27.0			\$27.0
Geode Capital Holdings	United States			\$339.7	\$339.7
Government Pension Investment Fund (GPIF)	Japan			\$111.8	\$111.8
HSBC	United Kingdom		\$193.7		\$193.7
Industrial and Commercial Bank of China	China		\$134.5		\$134.5
Invesco	United States			\$107.6	\$107.6
Japan Mutual Aid Association of Public School Teachers	Japan			\$178.7	\$178.7
JPMorgan Chase	United States		\$59.2		\$59.2
Legal & General	United Kingdom			\$121.1	\$121.1
Madison Investments	United States			\$89.3	\$89.3
MetLife	United States	\$47.5			\$47.5
Mirae Asset Financial Group	South Korea			\$99.5	\$99.5
Mitsubishi UFJ Financial	Japan		\$193.7		\$193.7
Modern Woodmen of America	United States	\$10.0			\$10.0
Morgan Stanley	United States		\$193.7		\$193.7
NatWest	United Kingdom		\$59.2		\$59.2
Ninety One	South Africa			\$340.9	\$340.9
Northern Trust	United States		\$59.2	\$113.2	\$172.5
OneAmerica Asset Management	United States	\$36.0			\$36.0
PNC Financial Services	United States		\$393.7		\$393.7
Power Financial Corporation	Canada			\$119.4	\$119.4
Primecap Management	United States			\$907.9	\$907.9
Principal Financial Group	United States	\$37.8			\$37.8
Prudential Financial (US)	United States	\$2.8			\$2.8
Ruane, Cunniff & Goldfarb	United States			\$400.4	\$400.4
Scotiabank	Canada		\$193.7		\$193.7
Securian	United States	\$13.5			\$13.5
Select Equity Partners	United States			\$801.4	\$801.4
Southern Farm Bureau Life Insurance	United States	\$4.0			\$4.0
State Farm	United States	\$71.0			\$71.0
State Street	United States	\$12.1	\$1,132.0		\$1,144.1
Sumitomo Mitsui Trust	Japan		\$113.5		\$113.5
T. Rowe Price	United States		\$155.4		\$155.4
TCW Group	United States	\$2.8			\$2.8
Toronto-Dominion Bank	Canada		\$193.7		\$193.7
Travelers	United States	\$15.0			\$15.0
Truist Financial	United States		\$59.2		\$59.2
UBS	Switzerland	\$2.8			\$2.8
US Bancorp	United States		\$193.7		\$193.7
Vanguard	United States		\$1,929.2		\$1,929.2
Wells Fargo	United States		\$743.8		\$743.8
White Mountains Insurance	Bermuda	\$27.9			\$27.9
GRAND TOTAL		\$438.6	\$4,337.4	\$11,027.8	\$15,803.9

14. L3 Harris Technologies (United States)

COMPANY PROFILE

L3 Harris Technologies was established in 2019 through the merger of Harris Corporation and L3 Technologies. The company describes itself as an agile global aerospace and defence technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs.²⁶⁰ L3 Harris Technologies is involved in the design and development of the Sentinel, the new Ground Based Strategic Deterrent for the US as well as producing key components for the Trident II (D5) system. In the financial year ending December 31, 2021, L3 Harris generated revenues of \$17.8 billion.²⁶¹

Contact

1025 W. NASA Boulevard
Melbourne, FL 32919
Tel: +1 321-727-9100

Website: www.facebook.com/L3HarrisTechnologies/
Facebook: <http://www.facebook.com/L3HarrisTechnologies/>
Instagram: www.instagram.com/l3harristech/
LinkedIn: <https://www.linkedin.com/company/l3harris-technologies/>
Twitter: <https://twitter.com/L3HarrisTech>
YouTube: https://www.youtube.com/channel/UCENNhZ_O63zkKUHkj6bsIIQ

TABLE 14: INVESTMENTS IN L3 HARRIS TECHNOLOGIES

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Ally Financial	United States		\$52.5			\$52.5
Aware Super	Australia			\$0.6		\$0.6
Bank of America	United States		\$353.8	\$1,999.3	\$1,254.9	\$3,608.0
Bank of New York Mellon	United States		\$57.1	\$249.7		\$306.9
Barclays	United Kingdom		\$191.7			\$191.7
BlackRock	United States			\$2,542.1		\$2,542.1
Brown Advisory	United States			\$462.1		\$462.1
California Public Employees' Retirement System (CalPERS)	United States			\$345.0		\$345.0
Capital Group	United States			\$5,377.3		\$5,377.3
Charles Schwab	United States			\$254.0		\$254.0
Citigroup	United States		\$230.0			\$230.0
Comerica	United States		\$57.1			\$57.1
Crédit Mutuel CIC Group	France		\$57.1			\$57.1

NUCLEAR WEAPONS

L3 Harris is part of the team put together by Northrop Grumman to build the Sentinel, the new Ground Based Strategic Deterrent. L3Harris will be designing the training systems.²⁶²

L3 Harris subsidiary Interstate Electronics Corporation was awarded a new five-year contract in 2021 for flight test instrumentation support and services related to the Trident II (D5) nuclear missile.²⁶³ The potential value of the contract is \$286 million.²⁶⁴

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

Deutsche Bank	Germany		\$274.2		\$274.2	
Diamond Hill Investment Group	United States			\$299.5	\$299.5	
Dimensional Fund Advisors	United States			\$253.9	\$253.9	
Fidelity Investments	United States			\$432.8	\$432.8	
First Abu Dhabi Bank	United Arab Emirates		\$125.0		\$125.0	
Franklin Resources	United States			\$605.0	\$605.0	
Geode Capital Holdings	United States			\$837.2	\$837.2	
Government Pension Fund Global	Norway			\$314.6	\$314.6	
Government Pension Investment Fund (GPIF)	Japan			\$284.1	\$284.1	
HSBC	United Kingdom		\$287.1		\$287.1	
Invesco	United States			\$298.0	\$298.0	
Janus Henderson	United Kingdom			\$850.1	\$850.1	
Japan Mutual Aid Association of Public School Teachers	Japan			\$469.3	\$469.3	
JPMorgan Chase	United States		\$230.0		\$230.0	
Länsförsäkringar	Sweden			\$5.2	\$5.2	
Legal & General	United Kingdom			\$285.7	\$285.7	
Lord, Abbett & Co	United States	\$81.2			\$81.2	
Macquarie Group	Australia	\$35.1			\$35.1	
MetLife	United States	\$65.8			\$65.8	
Mitsubishi UFJ Financial	Japan		\$191.7		\$191.7	
Mizuho Financial	Japan		\$125.0		\$125.0	
Morgan Stanley	United States		\$312.5	\$1,254.9	\$1,567.4	
National Pension Service	South Korea			\$259.4	\$259.4	
New York Life Insurance	United States	\$42.0			\$42.0	
Northern Trust	United States		\$205.0	\$304.1	\$509.1	
Northill Capital	United Kingdom			\$725.3	\$725.3	
Northwestern Mutual	United States	\$205.9			\$205.9	
Power Financial Corporation	Canada	\$64.9			\$64.9	
Royal Bank of Canada	Canada		\$105.0		\$105.0	
Scotiabank	Canada		\$296.7		\$296.7	
SMBC Group	Japan		\$274.2		\$274.2	
State Street	United States			\$2,208.0	\$2,208.0	
Sun Life Financial	Canada			\$427.4	\$427.4	
T. Rowe Price	United States			\$1,847.2	\$1,847.2	
TIAA	United States	\$113.0			\$113.0	
Toronto-Dominion Bank	Canada		\$205.0		\$205.0	
Truist Financial	United States		\$181.0		\$181.0	
US Bancorp	United States		\$296.7		\$296.7	
Vanguard	United States	\$158.3	\$4,216.4		\$4,374.7	
Wellington Management	United States			\$1,370.1	\$1,370.1	
Wells Fargo	United States		\$296.7	\$1,214.1	\$1,510.8	
White Mountains Insurance	Bermuda	\$48.9			\$48.9	
GRAND TOTAL		\$815.1	\$4,405.0	\$28,737.4	\$2,509.7	\$36,467.2

15. Leidos (United States)

COMPANY PROFILE

Leidos is active in defence, intelligence, civil, and health markets.²⁶⁵ Its defence sector activities include “enterprise and mission IT, large-scale intelligence systems, command and control, geospatial and data analytics, cybersecurity, logistics, training, and intelligence analysis and operations support”.²⁶⁶ In the financial year ending 31 December 2021, Leidos generated revenues of \$13.7 billion.²⁶⁷

Contact

Leidos Holdings Inc.

11951 Freedom Dr

Reston, VA 20190

United States

+1 (571) 526-6000

Website: <https://www.leidos.com>

Facebook: <https://www.facebook.com/LeidosInc/>

Instagram: <https://www.instagram.com/leidosinc/>

LinkedIn: <https://www.linkedin.com/company/leidos/>

Twitter: <https://twitter.com/leidosinc>

YouTube: <https://www.youtube.com/user/LeidosInc>

NUCLEAR WEAPONS

Leidos is part of the Consolidated Nuclear Security (CNS), LLC joint venture that manages and operates the Pantex Plant and the Y-12 National Security Complex where US nuclear weapons are assembled.²⁶⁸ Under the \$35.1 billion contract, the joint venture is “fully responsible for high-hazard enriched uranium, special nuclear material (SNM), high-explosive and nuclear weapon assembly/disassembly functions”.²⁶⁹ In July 2020, the National Nuclear Security Administration (NNSA) announced that it had ended its deal with CNS after the latter had failed to meet safety and security standards.^{cxii} While a new management and operation contract for both sites was initially awarded to Nuclear Production One in November 2021²⁷⁰, the US Department of Energy announced in May 2022 that it would terminate said contract award and instead hold two new competitions for separate contracts to manage each site, and in the meantime further extend the current contract held by CNS.²⁷¹ In October 2022, the contract held by CNS was formally extended with up to five years for the Y-12 National Security Complex and up to three years for the Pantex Plant.²⁷²

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020- 1 October 2021. All figures are in USD millions.

TABLE 15: INVESTMENTS IN LEIDOS

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Allianz	Germany	\$90.8				\$90.8
Aware Super	Australia			\$0.1		\$0.1
Baird	United States	\$121.4				\$121.4
Bank of America	United States		\$426.0	\$99.1	\$1,094.4	\$1,619.6
Bank of New York Mellon	United States			\$78.1		\$78.1
BlackRock	United States			\$1,549.2		\$1,549.2
BMO Financial Group	Canada		\$145.9		\$66.7	\$212.6
BNP Paribas	France		\$107.0			\$107.0
California Public Employees' Retirement System (CalPERS)	United States	\$64.8				\$64.8
Capital One Financial	United States		\$145.9		\$177.8	\$323.7
Causeway Capital Holdings	United States			\$103.9		\$103.9
Charles Schwab	United States			\$117.1		\$117.1
Citigroup	United States		\$319.0		\$1,094.4	\$1,413.5
Cooke & Bieler	United States			\$173.6		\$173.6
Dimensional Fund Advisors	United States			\$207.8		\$207.8

ETF Managers Group	United States			\$76.6		\$76.6
Fidelity Investments	United States			\$93.6		\$93.6
Fifth Third Bancorp	United States	\$107.0			\$66.7	\$173.7
First Trust Advisors	United States			\$249.9		\$249.9
Franklin Resources	United States	\$20.0				\$20.0
Geode Capital Holdings	United States			\$299.0		\$299.0
Goldman Sachs	United States	\$280.1			\$177.8	\$457.9
Government Pension Fund Global	Norway			\$126.6		\$126.6
Government Pension Investment Fund (GPIF)	Japan			\$126.5		\$126.5
Guggenheim Capital	United States	\$34.5				\$34.5
Invesco	United States			\$160.5		\$160.5
Janus Henderson	United Kingdom			\$82.7		\$82.7
Japan Mutual Aid Association of Public School Teachers	Japan			\$86.4		\$86.4
JPMorgan Chase	United States	\$46.1	\$319.0	\$1,011.2	\$177.8	\$1,554.1
Legal & General	United Kingdom			\$106.5		\$106.5
Macquarie Group	Australia	\$27.7				\$27.7
Mitsubishi UFJ Financial	Japan		\$319.0		\$1,094.4	\$1,413.5
Mizuho Financial	Japan		\$288.4		\$66.7	\$355.1
Northern Trust	United States		\$173.1	\$96.5		\$269.6
Orix Corporation	Japan			\$472.0		\$472.0
Pacific Mutual	United States	\$25.5				\$25.5
PNC Financial Services	United States		\$252.9		\$66.7	\$319.6
Prudential Financial (US)	United States	\$69.9				\$69.9
Regions Financial	United States		\$107.0		\$66.7	\$173.7
Royal Bank of Canada	Canada		\$107.0			\$107.0
Scotiabank	Canada		\$461.5		\$177.8	\$639.3
SMBC Group	Japan		\$107.0		\$111.1	\$218.1
State Street	United States			\$611.8		\$611.8
Sumitomo Mitsui Trust	Japan			\$83.4		\$83.4
Sun Life Financial	Canada			\$154.6		\$154.6
T. Rowe Price	United States			\$452.1		\$452.1
Toronto-Dominion Bank	Canada		\$107.0		\$66.7	\$173.7
US Bancorp	United States		\$145.9		\$177.8	\$323.7
Vanguard	United States	\$48.1		\$1,629.8		\$1,677.8
Victory Capital	United States			\$432.0		\$432.0
Wellington Management	United States			\$630.3		\$630.3
Wells Fargo	United States		\$426.0		\$66.7	\$492.7
GRAND TOTAL		\$548.7	\$4,345.1	\$9,310.8	\$4,749.9	\$18,954.5

16. Leonardo (Italy)

COMPANY PROFILE

Leonardo, based in Italy, develops products and services in the fields of aerospace, military and security.²⁷³

Leonardo has a 25% stake in the MBDA joint venture, which produces missiles for the French nuclear arsenal.²⁷⁴ In the financial year ending 31 December 2021, Leonardo generated revenues of €14.1 billion.²⁷⁵

Contact

Leonardo SpA

Registered Head Office:

Piazza Monte Grappa n. 4, 00195 Roma

+39 06.324731

Website: <https://www.leonardocompany.com/>

Flickr: <https://www.flickr.com/photos/leonardocompany>

Instagram: https://www.instagram.com/leonardo_company/

LinkedIn: https://www.linkedin.com/company/leonardo_company

Twitter: http://twitter.com/Leonardo_live

YouTube: <https://www.youtube.com/c/LeonardoCompany>

NUCLEAR WEAPONS

MBDA, in which Leonardo has a 25% stake, is the prime contractor for ASMPA nuclear missiles for the French arsenal.²⁷⁶ MBDA is also involved in developing the new ASN4G replacement for the ASMPA. The new weapon is scheduled to enter service in 2035 with range exceeding 1,000km, double that of the ASMPA. The French Directorate General for Armaments indicated that the ASN4G will be a hypersonic missile.²⁷⁷

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 16: INVESTMENTS IN LEONARDO

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Aegon	Netherlands	\$20.0				\$20.0
Anima	Italy	\$14.6				\$14.6
Banca Monte dei Paschi di Siena	Italy		\$87.5			\$87.5
Banca Passadore & C.	Italy		\$87.5			\$87.5
Banca Popolare di Sondrio	Italy		\$158.5			\$158.5
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$198.7			\$198.7
Banco BPM	Italy		\$485.1		\$62.5	\$547.6
Bank of America	United States		\$252.1		\$167.5	\$419.6
Bank of China	China		\$138.1			\$138.1
Barclays	United Kingdom		\$198.7		\$20.9	\$219.6
BlackRock	United States			\$44.5		\$44.5
BNP Paribas	France		\$615.6		\$62.5	\$678.1
BPER Banca	Italy		\$279.3			\$279.3
Cassa Depositi e Prestiti	Italy		\$221.3			\$221.3
Citigroup	United States		\$227.2		\$20.9	\$248.1
Commerzbank	Germany		\$252.1			\$252.1
Crédit Agricole	France		\$591.0		\$83.4	\$674.5
Crédit Mutuel CIC Group	France		\$138.1			\$138.1
Credit Suisse	Switzerland				\$20.9	\$20.9

Deutsche Bank	Germany		\$138.1			\$138.1
Dimensional Fund Advisors	United States			\$94.7		\$94.7
EFG International	Switzerland		\$50.5		\$62.5	\$113.0
European Investment Bank	Luxembourg		\$710.1			\$710.1
Goldman Sachs	United States				\$167.5	\$167.5
Government Pension Fund Global	Norway			\$48.3		\$48.3
Groupe BPCE	France	\$31.0	\$166.5			\$197.5
Guggenheim Capital	United States	\$15.0				\$15.0
HSBC	United Kingdom		\$333.6		\$62.5	\$396.1
Intesa Sanpaolo	Italy		\$750.5		\$83.4	\$834.0
JPMorgan Chase	United States		\$138.1		\$167.5	\$305.5
M&G	United Kingdom	\$13.2				\$13.2
Mediobanca Banca di Credito Finanziario	Italy		\$138.1			\$138.1
Mitsubishi UFJ Financial	Japan		\$252.1		\$20.9	\$273.0
Morgan Stanley	United States				\$20.9	\$20.9
NatWest	United Kingdom		\$273.0		\$62.5	\$335.5
Santander	Spain		\$198.7			\$198.7
SMBC Group	Japan		\$322.9			\$322.9
Société Générale	France		\$433.0		\$62.5	\$495.5
T. Rowe Price	United States			\$64.1		\$64.1
TIAA	United States	\$30.0				\$30.0
UniCredit	Italy		\$642.8		\$83.4	\$726.2
Vanguard	United States			\$111.7		\$111.7
GRAND TOTAL		\$123.8	\$8,478.5	\$363.3	\$1,232.4	\$10,197.9

17. Lockheed Martin (United States)

COMPANY PROFILE

Lockheed Martin focuses on “research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services.”²⁷⁸

In the financial year ending 31 December 2021, Lockheed Martin reported net sales over \$67 billion.²⁷⁹

Contact

Lockheed Martin
6801 Rockledge Drive,
Bethesda, Maryland 20817-1877
United States
+1.301.897.6000

Website: <https://www.lockheedmartin.com/en-us/index.html>

Facebook: <http://www.facebook.com/lockheedmartin>

Instagram: <http://instagram.com/lockheedmartin>

LinkedIn: <http://www.linkedin.com/company/lockheed-martin/careers>

Twitter: <http://twitter.com/lockheedmartin>

YouTube: <http://www.youtube.com/user/LockheedMartinVideos>

NUCLEAR WEAPONS

Lockheed Martin is producing command and control systems and, as part of the Northrop Grumman team, is responsible for missile payload integration for the Sentinel, the new US Ground Based Strategic Deterrent.²⁸⁰

Lockheed Martin has been the principal designer, manufacturer and sustainer of Minuteman III re-entry systems since the 1960s and anticipates continuing through 2030.²⁸¹ The company has several outstanding contracts for work on the Minuteman III ICBM system, including a five-year \$2.9 billion contract awarded in 2018²⁸², a ten year contract awarded in 2019, valued at \$468.5 million²⁸³, and a three year \$240.9 million contract, also awarded in 2019²⁸⁴, the latter two for the Minuteman re-entry systems.

Lockheed Martin is also contracted to design and develop a fully functional prototype for the Airborne Launch Control System Replacement (ALCS-R) program, under a \$94.3 million contract. The contract states that “ALCS-R will deliver an affordable total system replacement of the legacy ALCS to support the Minuteman III intercontinental

ballistic missile weapon system through estimated 2036 and provide a solution to meet the survivable launch platform – airborne fire control requirements for the ground based strategic deterrent weapon system through 2075”.²⁸⁵

The US Navy is also planning to use the Lockheed Martin C-130J-30 Hercules aircraft for nuclear command and communications, specifically in a Take Charge And Move Out (TACAMO) role.²⁸⁶

Lockheed Martin is responsible for the construction of the Trident II (D5) nuclear missiles for both the UK and the US²⁸⁷ It has several outstanding contracts related to Trident production, valued at more than \$6.3 billion, some of which planned to continue through at least 2028.²⁸⁸

In addition, some contracts, like one awarded in April 2019 for “engineering and technical support services and deliverable materials for the Trident II Fleet Ballistic Missile System”, were arranged by the US Department of Defense, but the nearly \$18 million will be paid for by the UK Government.²⁸⁹ For another four-year, \$63.8 million Trident contract, the US government is awarding to the company even though it “cannot establish in advance or accurately forecast the following: The exact nature and extent of the work covered by this contract; The precise method of performing the work; and The cost of performing the work.”²⁹⁰

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 17: INVESTMENTS IN LOCKHEED MARTIN

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Academy Securities	United States				\$2.9	\$2.9
Ameriprise Financial	United States			\$913.1		\$913.1
ANZ	Australia		\$50.0		\$17.3	\$67.3
Bank of America	United States		\$2,100.0	\$1,152.3	\$103.5	\$3,355.8
Bank of New York Mellon	United States		\$80.0			\$80.0
Barclays	United Kingdom		\$150.0		\$17.3	\$167.3
BlackRock	United States			\$5,954.7		\$5,954.7
Blaylock Beal Van	United States				\$2.9	\$2.9
California Public Employees' Retirement System (CalPERS)	United States	\$86.5				\$86.5
Capital Group	United States			\$8,609.1		\$8,609.1
Charles Schwab	United States			\$2,320.0		\$2,320.0
Citigroup	United States		\$2,100.0		\$103.5	\$2,203.5
CL King & Associates	United States				\$2.9	\$2.9
Crédit Agricole	France		\$891.7		\$103.5	\$995.2
Crédit Mutuel CIC Group	France		\$50.0			\$50.0
Drexel Hamilton	United States				\$2.9	\$2.9
Fidelity Investments	United States			\$1,771.5		\$1,771.5
Fifth Third Bancorp	United States		\$50.0			\$50.0
Franklin Resources	United States			\$1,015.5		\$1,015.5
Geode Capital Holdings	United States			\$1,850.3		\$1,850.3
Goldman Sachs	United States		\$254.2		\$34.5	\$288.7
GQG Partners	United States			\$763.4		\$763.4
JPMorgan Chase	United States		\$2,100.0		\$103.5	\$2,203.5
Legal & General	United Kingdom			\$608.0		\$608.0
Lloyds Banking Group	United Kingdom		\$434.2		\$17.3	\$451.4
Macquarie Group	Australia	\$84.0				\$84.0
Mischler Financial Group	United States				\$2.9	\$2.9
Mitsubishi UFJ Financial	Japan		\$80.0			\$80.0
Mizuho Financial	Japan		\$2,100.0		\$235.8	\$2,335.8
Morgan Stanley	United States		\$80.0	\$1,618.0	\$235.8	\$1,933.8
Northern Trust	United States		\$300.0	\$730.1		\$1,030.1
Penserra Capital Management	United States				\$2.9	\$2.9
PNC Financial Services	United States		\$50.0			\$50.0
Prudential Financial (US)	United States	\$94.1				\$94.1
R. Seelaus & Co	United States				\$2.9	\$2.9
Riyad Bank	Saudi Arabia		\$466.7			\$466.7
Royal Bank of Canada	Canada		\$80.0		\$17.3	\$97.3
Shank Williams Cisneros & Co	United States				\$2.9	\$2.9
SMBC Group	Japan		\$150.0		\$34.5	\$184.5
State Street	United States		\$50.0	\$17,118.9		\$17,168.9
TIAA	United States	\$154.8				\$154.8
Toronto-Dominion Bank	Canada		\$150.0		\$34.5	\$184.5
UBS	Switzerland			\$703.8		\$703.8
UniCredit	Italy		\$400.0		\$17.3	\$417.3
US Bancorp	United States		\$504.2		\$34.5	\$538.7
Vanguard	United States			\$9,966.7		\$9,966.7
Wellington Management	United States			\$1,900.2		\$1,900.2
Wells Fargo	United States		\$329.2	\$1,097.6	\$17.3	\$1,444.0
GRAND TOTAL		\$419.3	\$13,000.0	\$58,093.3	\$1,150.0	\$72,662.6

18. Northrop Grumman (United States)

COMPANY PROFILE

Northrop Grumman, is an aerospace, defence and security company, which conducts most of its business with the US Department of Defence and intelligence community.²⁹¹ In the financial year ending 31 December 2021, Northrop Grumman reported \$35,667 million in sales.²⁹²

In June 2018 Northrop Grumman acquired Orbital ATK and renamed it Northrop Grumman Innovation Systems.²⁹³ Orbital ATK and its subsidiary ATK Launch Systems held nuclear weapons contracts for the US arsenal prior to the acquisition. By acquiring Orbital ATK, Northrop Grumman took over the Sentinel (GBSD), Minuteman III and Trident contracts of Orbital ATK and its subsidiary, ATK Launch Systems.

In February 2021, Veritas Capital, combining its business with Peraton, completed its acquisition of Northrop Grumman's IT and Mission Support Services Business.²⁹⁴ As a result, Peraton is now the recipient of a \$6.7 million contract for work on the Minuteman III system, previously held by Northrop Grumman.²⁹⁵

Contact

Northrop Grumman Corporation
2980 Fairview Park Drive
Falls Church, VA 22042
+1.703.280.2900

Website: <http://www.northropgrumman.com/>
Facebook: <http://www.facebook.com/NorthropGrumman>
Instagram: @NorthropGrumman
LinkedIn: <http://www.linkedin.com/company/northrop-grumman-corporation>
Twitter: @NGCNews | @NorthropGrumman
YouTube: <http://www.youtube.com/user/northropgrummanmedia>

NUCLEAR WEAPONS

Northrop Grumman is building the 'Sentinel', as the Ground-based Strategic Deterrent, the new intercontinental ballistic missile system for the US, has been named, under a \$13.3 billion nine-year contract awarded in 2020.²⁹⁶

Northrop Grumman subsidiary ATK Launch Systems is part of the Consolidated Nuclear Security (CNS), LLC joint venture that since 2013 manages and operates the Pantex Plant and the Y-12 National Security Complex where US nuclear weapons are assembled.²⁹⁷ Under the \$35.1 billion contract, the joint venture is "fully responsible for high-hazard enriched uranium, special nuclear material (SNM), high-explosive and nuclear weapon assembly/disassembly functions".²⁹⁸ In July 2020, the National Nuclear Security Administration (NNSA) announced that it had ended its deal with CNS after the latter had failed to meet safety and security standards.^{cxii} While a new management and operation contract for both sites was initially awarded to Nuclear Production One in November 2021²⁹⁹, the US Department of Energy announced in May 2022 that it would terminate said contract award and instead hold two new competitions for separate contracts to manage each site, and in the meantime further extend the current contract held by CNS.³⁰⁰ In October 2022, the contract held by CNS was formally extended with up to five years for the Y-12 National Security Complex and up to three years for the Pantex Plant.³⁰¹

Northrop was also awarded a \$52 million contract modification in November 2019 for "Strategic Automated Command and Control System Replacement (SACCS-R)". The contract will run through July 2023.³⁰² This is part of the replacement of the aging air-gapped hardware systems related to command, control and communications, including the infamous 8-inch floppy disks.³⁰³

Northrop Grumman Space & Mission Systems Corp was awarded a \$1.7 billion contract in December 1997 to continue Minuteman III sustainment support while a new contractor was found, the contract has been repeatedly extended until at least November 2022.³⁰⁴

By acquiring Orbital ATK, Northrop Grumman took over the contracts of Orbital ATK and its subsidiary ATK Launch Systems. Orbital ATK was responsible for refurbishing all three solid propellant stages of the Minuteman III Intercontinental Ballistic Missile (ICBM) under the plan to keep the missiles operational until at least 2030.³⁰⁵ Northrop Grumman also has two outstanding contracts from 2021 for work on the Minuteman III system, with a potential total value of \$21.6 billion.³⁰⁶

ATK Launch Systems was also awarded a \$86.4 million contract in 2018 for procurement of motor and component

test, evaluation, engineering support, and disposal for all stages of Minuteman and Peacekeeper systems, which will run through 2026.³⁰⁷

Sandia National Laboratory is directly involved in the nuclear weapon modernisation programmes of at least the W88 Alt 37 warhead³⁰⁸ and the W76-1 warhead³⁰⁹ (both used for arming the submarine launched Trident II (D5) missiles), the new W80-4 warheads for the Long Range Standoff missiles³¹⁰, and the new B61-12 gravity bomb.³¹¹ National Technology and Engineering Solutions of Sandia (NTES), a wholly owned subsidiary of Honeywell, has the contract for the management and operation of Sandia National Laboratories (SNL). The contract runs until April 2027 with a potential total value of \$43.3 billion.³¹² Northrop Grumman and Universities Research Association³¹³ support NTES in the performance of this contract.³¹⁴

Northrop Grumman produces propulsion systems for the Trident II (D5) missiles.³¹⁵ Northrop has several outstanding contracts from both the US and UK for work on the Trident missiles. These include a nine-year \$307.8 million contract awarded in 2015³¹⁶ and a four-year \$213.1 million contract awarded in 2020³¹⁷ for the underwater launcher systems. The US Department of Defense awarded Northrop Grumman another seven-year contract in March 2019 to work on the common missile compartment used for Trident missiles by both new UK Dreadnought and US Columbia class submarines. The contract has a potential value of \$372.5 million.³¹⁸

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

Northern Trust	United States			\$415.8		\$415.8
Northwestern Mutual	United States	\$106.0				\$106.0
Power Financial Corporation	Canada			\$785.3		\$785.3
Sanders Capital	United States			\$1,487.2		\$1,487.2
Scotiabank	Canada				\$33.8	\$33.8
Shank Williams Cisneros & Co	United States				\$16.9	\$16.9
SMBC Group	Japan				\$90.0	\$90.0
State Farm	United States	\$71.0				\$71.0
State Street	United States			\$6,449.4		\$6,449.4
Sun Life Financial	Canada			\$2,447.8		\$2,447.8
UniCredit	Italy		\$433.3		\$33.8	\$467.1
US Bancorp	United States				\$90.0	\$90.0
Vanguard	United States	\$77.0		\$5,327.0		\$5,404.0
Wellington Management	United States			\$3,880.0		\$3,880.0
Wells Fargo	United States		\$1,350.0		\$326.2	\$1,676.2
GRAND TOTAL		\$329.8	\$4,000.0	\$40,594.4	\$2,671.7	\$47,595.9

TABLE 18: INVESTMENTS IN NORTHROP GRUMMAN

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Academy Securities	United States				\$33.8	\$33.8
Ameriprise Financial	United States			\$1,017.4		\$1,017.4
ANZ	Australia				\$33.8	\$33.8
Bank of America	United States		\$433.3	\$1,380.9	\$371.2	\$2,185.4
Bank of New York Mellon	United States				\$33.8	\$33.8
Bessemer Group	United States			\$400.4		\$400.4
BlackRock	United States			\$2,898.1		\$2,898.1
BNP Paribas	France				\$230.6	\$230.6
Capital Group	United States			\$5,567.2		\$5,567.2
Citigroup	United States		\$1,350.0		\$230.6	\$1,580.6
Credit Suisse	Switzerland				\$90.0	\$90.0
Fidelity Investments	United States			\$2,588.1		\$2,588.1
Franklin Resources	United States			\$809.6		\$809.6
Geode Capital Holdings	United States			\$1,130.0		\$1,130.0
Goldman Sachs	United States				\$185.6	\$185.6
Guardian Life Insurance Company of America	United States	\$75.8				\$75.8
Japan Mutual Aid Association of Public School Teachers	Japan			\$457.1		\$457.1
JPMorgan Chase	United States		\$433.3	\$1,922.5	\$675.0	\$3,030.9
Macquarie Group	Australia			\$701.6		\$701.6
Mischler Financial Group	United States				\$16.9	\$16.9
Mitsubishi UFJ Financial	Japan				\$90.0	\$90.0
Mizuho Financial	Japan				\$90.0	\$90.0
Morgan Stanley	United States			\$929.1		\$929.1

19. Raytheon Technologies Corporation (United States)

COMPANY PROFILE

Raytheon Technologies produces aviation, space and defence systems.³¹⁹ The company is involved in the production of the Sentinel and the Long Range Standoff (LRSO) weapons system as well as the sustainment of the Minuteman programme for the US arsenal. Raytheon reported sales over \$64.4 billion in 2021.³²⁰ Raytheon and United Technologies merged in April 2020 to create Raytheon Technologies Corporation. The new company combines the aerospace and defence business from United Technologies and Raytheon.³²¹ This profile reflects the merger.

Contact

Raytheon Technologies Corporation
1000 Wilson Blvd.
Arlington, VA 22209
(781) 522-3000

Website: <https://www.raytheon.com/>
Facebook: <http://www.facebook.com/raytheon>
Instagram: <http://instagram.com/raytheoncompany>
LinkedIn: <http://www.linkedin.com/company/raytheon>
Twitter: <http://www.twitter.com/raytheon>
YouTube: <http://www.youtube.com/raytheoncompany>

NUCLEAR WEAPONS

In July 2021, Raytheon Technologies received a \$2 billion, 6-year contract from the US Air Force Nuclear Weapons Center at Eglin Air Force Base for continued development and manufacture of the Long Range Standoff (LRSO) weapons system.³²²

Collins Aerospace, a Raytheon Technologies unit, will build the secondary launch platform-airborne system for the Sentinel, the new US Ground Based Strategic Deterrent. This key component for nuclear weapons command and control also works with the existing Minuteman III system.³²³

Raytheon was awarded a contract in 2013 for logistic support, installation, and sustainment of Minuteman MEECN (Minimum Essential Emergency Communication Network) programme and the Minuteman MEECN programme upgrade. The contract is valued at \$75 million and will run until at least April 2023.³²⁴

In September 2022, Raytheon was also awarded a contract for the design, development and initial delivery of the Hypersonic Attack Cruise Missile (HACM).³²⁵ At this stage of the research and development it is still unclear whether those new missiles will carry a nuclear or conventional payload.

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 19: INVESTMENTS IN RAYTHEON

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Academy Securities	United States				\$371	\$371
Ameriprise Financial	United States			\$1,473.8		\$1,473.8
ANZ	Australia				\$55.0	\$55.0
Bank of America	United States		\$596.4	\$1,443.7	\$2,110.4	\$4,150.6
Bank of New York Mellon	United States		\$90.0		\$55.0	\$145.0
Barclays	United Kingdom		\$125.0		\$107.3	\$232.3
BlackRock	United States			\$7,934.0		\$7,934.0
Blaylock Beal Van	United States				\$25.1	\$25.1
BMO Financial Group	Canada				\$20.0	\$20.0
BNP Paribas	France		\$163.4		\$557.2	\$720.6
Capital Group	United States			\$11,704.5		\$11,704.5
CastleOak Securities	United States				\$25.1	\$25.1
Charles Schwab	United States			\$1,186.7		\$1,186.7

Citigroup	United States		\$864.6		\$2,103.8	\$2,968.4
CL King & Associates	United States				\$12.0	\$12.0
Crédit Agricole	France		\$150.0		\$142.3	\$292.3
Credit Suisse	Switzerland		\$125.0		\$55.0	\$180.0
Deutsche Bank	Germany		\$288.4		\$2,103.8	\$2,392.2
Dodge & Cox	United States			\$3,786.5		\$3,786.5
Equitable Holdings	United States			\$871.2		\$871.2
Fidelity Investments	United States			\$1,324.1		\$1,324.1
Fisher Investments	United States			\$799.1		\$799.1
Franklin Resources	United States			\$3,566.6		\$3,566.6
Geode Capital Holdings	United States			\$2,401.6		\$2,401.6
Goldman Sachs	United States		\$163.4		\$2,006.8	\$2,170.2
Government Pension Fund Global	Norway	\$216.7		\$1,247.3		\$1,464.0
Government Pension Investment Fund (GPIF)	Japan			\$766.8		\$766.8
HSBC	United Kingdom		\$90.0			\$90.0
Invesco	United States			\$1,328.1		\$1,328.1
Japan Mutual Aid Association of Public School Teachers	Japan			\$1,288.9		\$1,288.9
JPMorgan Chase	United States		\$633.4	\$2,306.5	\$2,110.4	\$5,050.3
KeyCorp	United States		\$45.0			\$45.0
Legal & General	United Kingdom			\$783.6		\$783.6
Loop Capital	United States				\$12.0	\$12.0
Macquarie Group	Australia			\$762.0		\$762.0
MFR	United States				\$12.0	\$12.0
Mischler Financial Group	United States				\$13.1	\$13.1
Mitsubishi UFJ Financial	Japan		\$90.0		\$107.3	\$197.3
Mizuho Financial	Japan		\$150.0		\$255.3	\$405.3
Morgan Stanley	United States		\$288.4	\$2,328.3	\$2,111.8	\$4,728.5
NatWest	United Kingdom		\$45.0			\$45.0
Neuberger Berman	United States			\$754.1		\$754.1
Northern Trust	United States		\$125.0	\$924.3		\$1,049.3
R. Seelaus & Co	United States				\$13.1	\$13.1
Riyad Bank	Saudi Arabia		\$163.4			\$163.4
Royal Bank of Canada	Canada				\$142.3	\$142.3
Scotiabank	Canada		\$163.4		\$55.0	\$218.4
Shank Williams Cisneros & Co	United States				\$29.1	\$29.1
SMBC Group	Japan				\$255.3	\$255.3
State Street	United States		\$45.0	\$13,052.8		\$13,097.8
Sun Life Financial	Canada			\$923.4		\$923.4
TIAA	United States			\$1,323.8		\$1,323.8
Truist Financial	United States		\$45.0			\$45.0
UBS	Switzerland			\$1,046.7		\$1,046.7
UniCredit	Italy				\$142.3	\$142.3
US Bancorp	United States		\$253.4		\$55.0	\$308.4
Vanguard	United States			\$11,957.7		\$11,957.7
Wellington Management	United States			\$5,454.1		\$5,454.1
Wells Fargo	United States		\$393.2	\$1,007.7	\$107.3	\$1,508.2
GRAND TOTAL		\$216.7	\$5,096.4	\$83,747.9	\$14,837.6	\$103,898.6

20. Rostec (Russian Federation)

COMPANY PROFILE

Rostec is involved in engineering, manufacture, arms production, medical equipment, biotech and aircraft engineering, among others.³²⁶ The company reported 179.2 billion rubles in net profit in 2019 (the last date for which figures are available).³²⁷ Since Russia's invasion in Ukraine, US agencies, in coordination with other G7 countries, have imposed sanctions on entities critical to Russia's defense industrial base, including Rostec.³²⁸ As a result, all entities owned 50 % or more by Rostec are blocked. Rostec has also been sanctioned by Australia, Canada, the European Union (EU), New Zealand, Switzerland and the UK.

Contact

Rostec
24 Usacheva Street,
Moscow,
Russian Federation 119048
Email: info@rostec.ru
Website: <https://rostec.ru/en/>

2021. All figures are in USD millions.

TABLE 20: INVESTMENTS IN ROSTEC

INVESTOR	COUNTRY	LOANS	UNDERWRITING	GRAND TOTAL
Novikombank	Russia		\$10.2	\$10.2
Sovcombank	Russia		\$10.2	\$10.2
VTB Group	Russia	\$3,000.0		\$3,000.0
GRAND TOTAL		\$3,000.0	\$20.5	\$3,020.5

NUCLEAR WEAPONS

Rostec produces the Iskander-M missile system. SpecChemistry JSC, one of the Rostec entities, produces over 80% of necessary components for Russian missiles.³²⁹

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October

21. Safran (France)

COMPANY PROFILE

Safran, based in France, is a company with three key business areas: the aircraft propulsion, equipment and interiors, space and defence markets.³³⁰ Safran is a 50% owner of ArianeGroup, which has contracts for French nuclear weapon production.³³¹ In the financial year ending 31 December 2021 Safran reported revenues of €15.3 billion.³³²

Contact

Safran
2, Boulevard du Général Martial Valin
75724 Paris Cedex 15 – France
Tel: +(33) 1 40 60 80 80
Fax: +(33) 1 40 60 81 02

Website: <https://www.safran-group.com/>
Facebook: <http://www.facebook.com/GroupeSafran>
Instagram: http://instagram.com/safran_group/
LinkedIn: <https://www.linkedin.com/company/safran>
Twitter: <http://twitter.com/SAFRAN>
YouTube: <https://www.youtube.com/user/GroupeSafran>

NUCLEAR WEAPONS

ArianeGroup is responsible for the ongoing maintenance of the French M51 submarine launched ballistic missiles. ArianeGroup states that its role in the M51 production “covers upstream research, design, development and production of the missiles, the land-based operating infrastructure and the command and control system on board the submarines. ArianeGroup is also responsible for the system support in service as well as end-of-life disposal”.³³³ According to the French 2023 Defense budget, 2023 funding is mainly reserved for the continuation of the development and production work of M51.3, as well as preparatory work for M51.4, with ArianeGroup as the prime contractor.³³⁴

Safran's subsidiary, Herakles, is involved in the design, development, manufacture and sale of solid propulsion systems and related equipment for all types of rockets and tactical and cruise missiles for air, sea and ground forces, through a joint venture with MBDA called Roxel.³³⁵ Roxel is also involved in ASMP/ ASMP-A missile production, providing boosters and additional devices.³³⁶

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 21: INVESTMENTS IN SAFRAN

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
American Equity	United States	\$20.0				\$20.0
Artisan Partners	United States			\$561.3		\$561.3
AustralianSuper	Australia			\$237.0		\$237.0
Aviva	United Kingdom	\$40.0				\$40.0
Bank of America	United States				\$610.4	\$610.4
BlackRock	United States			\$2,501.7		\$2,501.7
BNP Paribas	France				\$658.0	\$658.0
Capital Group	United States			\$5,270.6		\$5,270.6
Children's Investment Fund Management	United Kingdom			\$1,757.6		\$1,757.6
Crédit Agricole	France				\$658.0	\$658.0
Crédit Mutuel CIC Group	France				\$278.3	\$278.3
Deutsche Bank	Germany				\$593.9	\$593.9
European Investment Bank	Luxembourg		\$598.5			\$598.5
Fidelity Investments	United States			\$391.7		\$391.7
Government Pension Investment Fund (GPIF)	Japan			\$285.7		\$285.7

Grantham Mayo Van Otterloo & Co	United States			\$234.7		\$234.7
Groupe BPCE	France				\$677.5	\$677.5
HSBC	United Kingdom				\$788.1	\$788.1
Japan Mutual Aid Association of Public School Teachers	Japan			\$760.7		\$760.7
Macquarie Group	Australia	\$50.0				\$50.0
MassMutual Holdings	United States	\$62.9				\$62.9
MetLife	United States	\$30.0				\$30.0
Mitsubishi UFJ Financial	Japan			\$500.7		\$500.7
Santander	Spain			\$373.6		\$373.6
SMBC Group	Japan			\$278.3		\$278.3
Société Générale	France			\$567.7		\$567.7
Standard Chartered	United Kingdom			\$278.3		\$278.3
Sun Life Financial	Canada			\$228.7		\$228.7
TIAA	United States	\$20.0		\$229.5		\$249.5
Unum Group	United States	\$20.0				\$20.0
Vanguard	United States			\$1,018.6		\$1,018.6
Victory Capital	United States	\$20.0				\$20.0
Wellington Management	United States			\$261.7		\$261.7
GRAND TOTAL		\$262.9	\$598.5	\$13,739.5	\$6,262.6	\$20,863.4

22. Textron (United States)

COMPANY PROFILE

Textron is a US-based multi-industry company engaged in aircraft, military, industrial and finance businesses.³³⁷ Textron brands include Cessna, Beechcraft, Bell, Artic Cat and more.³³⁸ The company produces key components for the US Minuteman missiles and is involved in the production of the Sentinel, the new US Ground Based Strategic Deterrent. In the financial year ending 31 December 2021, Textron reported revenues of \$12.4 billion³³⁹

Contact

Textron World Headquarters
40 Westminster Street
Providence, RI 02903
USA.
Phone: +1 (401) 421-2800

Website: <https://www.textron.com/>
Facebook: <https://www.facebook.com/#!/Textron.Inc>
Instagram: <https://instagram.com/textron/>
LinkedIn: <https://www.linkedin.com/company/textron>
Twitter: <https://twitter.com/Textron>
YouTube: <http://www.youtube.com/textroninc>

NUCLEAR WEAPONS

Textron Systems was awarded a contract in 2014 for multiprobe antennas for the Minuteman missiles. The contract has a \$66.1 million potential value and is expected to continue until at least July 2029.³⁴⁰

Textron also has a contract for Mod 5F midsections for the Minuteman Missiles. Initially awarded in 2014, the contract is expected to continue until at least March 2024 with an estimated total value of about \$39.9 million.³⁴¹

Textron Systems will be involved in developing the missile payload integration for the Sentinel, the new US Ground Based Strategic Deterrent.³⁴²

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 22: INVESTMENTS IN TEXTRON

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
Adage Capital Partners	United States			\$344.0		\$344.0
Allianz	German	\$24.3				\$24.3
American Financial Group	United States	\$40.0				\$40.0
Ameriprise Financial	United States			\$81.1		\$81.1
AQR Capital Management	United States			\$103.8		\$103.8
Baird	United States	\$19.7				\$19.7
Bank of America	United States		\$115.0		\$163.6	\$278.6
Bank of China	China		\$42.5			\$42.5
Bank of New York Mellon	United States		\$57.5	\$85.6	\$14.5	\$157.6
BlackRock	United States			\$1,074.7		\$1,074.7
Charles Schwab	United States			\$126.8		\$126.8
Citigroup	United States		\$115.0		\$119.6	\$234.6
Dimensional Fund Advisors	United States			\$222.9		\$222.9
Equitable Holdings	United States			\$124.2		\$124.2
Export-Import Bank of the United States	United States		\$350.0			\$350.0
Fidelity Investments	United States			\$97.7		\$97.7
Franklin Resources	United States	\$29.3				\$29.3

Gabelli Funds	United States			\$211.0		\$211.0
Geode Capital Holdings	United States			\$317.2		\$317.2
Goldman Sachs	United States	\$85.0			\$119.6	\$204.6
Government Pension Investment Fund (GPIF)	Japan			\$79.1		\$79.1
Groupe BPCE	France	\$29.1				\$29.1
Guggenheim Capital	United States	\$64.1				\$64.1
Invesco	United States			\$777.9		\$777.9
Japan Mutual Aid Association of Public School Teachers	Japan			\$76.9		\$76.9
JPMorgan Chase	United States	\$115.0	\$139.5	\$181.8		\$436.3
Legal & General	United Kingdom			\$104.3		\$104.3
Loop Capital	United States				\$7.3	\$7.3
LSV Asset Management	United States			\$135.8		\$135.8
Mitsubishi UFJ Financial	Japan	\$115.0			\$111.7	\$226.7
Morgan Stanley	United States			\$113.5		\$113.5
National Western Life Group	United States	\$18.7				\$18.7
Northern Trust	United States		\$42.5	\$105.8		\$148.3
OneAmerica Asset Management	United States	\$25.0				\$25.0
Orix Corporation	Japan			\$486.8		\$486.8
PNC Financial Services	United States		\$407.5		\$73.8	\$481.3
Power Financial Corporation	Canada	\$48.0				\$48.0
Primecap Management	United States			\$417.0		\$417.0
Prudential Plc	United Kingdom	\$18.4				\$18.4
Pzena Investment Management	United States			\$148.4		\$148.4
Rothschild Group	France			\$91.5		\$91.5
Shank Williams Cisneros & Co	United States				\$10.0	\$10.0
SMBC Group	Japan	\$85.0			\$183.3	\$268.3
State Street	United States			\$711.4		\$711.4
T. Rowe Price	United States			\$3,506.9		\$3,506.9
The Hartford	United States	\$21.3				\$21.3
TIAA	United States	\$61.6		\$153.5		\$215.1
Toronto-Dominion Bank	Canada			\$142.7		\$142.7
US Bancorp	United States		\$85.0		\$105.6	\$190.6
Vanguard	United States	\$18.7		\$1,748.2		\$1,766.8
Victory Capital	United States			\$452.7		\$452.7
Wells Fargo	United States		\$85.0		\$59.1	\$144.1
GRAND TOTAL		\$418.2	\$1,700.0	\$12,180.7	\$1,150.0	\$15,448.8

23. Thales (France)

COMPANY PROFILE

Thales is a French-headquartered company engaged in digital identity and security, defence and security, aerospace, space, and transport.³⁴³ The French state (25.7%) and aircraft manufacturer Dassault Aviation (24.6%) are the main shareholders of Thales.³⁴⁴ The company is involved in French ASMPA mid-life upgrade and the adaptation of the M51 missile adaptation for French submarines. In the financial year ending 31 December 2021, Thales generated revenues of € 16.2 billion.³⁴⁵

Thales has a 35% shareholding in Naval Group: "Naval Group is a French-law Public Limited Company which, on 31 December 2021, was owned for 62,25% by the French State, 35% by Thales, 1.58% by the Group's employees and former employees through the company employee mutual fund and 1.17% self-managed."³⁴⁶

Contact

Thales Headquarters
Tour Carpe Diem
31 Place des Corolles – CS 20001
92098 Paris La Defense Cedex, France
Phone: +33 (0) 1 57 77 80 00

Website: www.thalesgroup.com
Facebook: www.facebook.com/thalesgroup/
LinkedIn: www.linkedin.com/company/thales
Twitter: twitter.com/thalesgroup
YouTube: www.youtube.com/user/thethalesgroup

NUCLEAR WEAPONS

According to the French Ministry of Defence, Thales is one of MBDA's subcontractors in the French ASMPA mid-life upgrade.³⁴⁷ The ASMPA is a medium-range air-to-ground nuclear armed cruise missile, and part of the French nuclear arsenal.³⁴⁸

As part of Naval group, Thales is also producing key components for the M51 missile adaptation for the French nuclear submarines.³⁴⁹

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 23: INVESTMENTS IN THALES

INVESTOR	COUNTRY	BONDHOLDING	LOANS	SHAREHOLDING	UNDERWRITING	GRAND TOTAL
ANZ	Australia		\$163.0			\$163.0
Banco Bilbao Vizcaya Argentaria (BBVA)	Spain		\$219.2			\$219.2
Barclays	United Kingdom		\$163.0			\$163.0
BlackRock	United States	\$19.6		\$202.1		\$221.7
BNP Paribas	France		\$219.2		\$135.2	\$354.4
Capital Group	United States			\$237.2		\$237.2
Citigroup	United States		\$163.0			\$163.0
Commerzbank	Germany		\$219.2		\$246.1	\$465.3
Crédit Agricole	France		\$393.3		\$246.1	\$639.4
Crédit Mutuel CIC Group	France		\$219.2		\$246.1	\$465.3
Deutsche Bank	Germany		\$219.2		\$135.2	\$354.4

Government Pension Fund Global	Norway			\$220.8		\$220.8
Groupe BPCE	France		\$163.0	\$335.3	\$246.1	\$744.4
HSBC	United Kingdom		\$219.2		\$135.2	\$354.4
JPMorgan Chase	United States		\$219.2			\$219.2
Santander	Spain		\$219.2		\$246.1	\$465.3
SMBC Group	Japan		\$163.0			\$163.0
Société Générale	France		\$219.2		\$135.2	\$354.4
Standard Chartered	United Kingdom		\$163.0			\$163.0
T. Rowe Price	United States			\$425.5		\$425.5
UniCredit	Italy		\$219.2		\$135.2	\$354.4
Vanguard	United States			\$349.4		\$349.4
Wellington Management	United States			\$234.7		\$234.7
GRAND TOTAL		\$19.6	\$3,563.0	\$2,005.0	\$1,906.4	\$7,494.0

24. Walchandnagar Industries (India)

COMPANY PROFILE

Walchandnagar Industries Limited (WIL), based in India, is a heavy engineering and high-tech manufacturing company with activities in the areas of nuclear power, aerospace, missile, defence, oil & gas, steam generation plants, independent power projects, turnkey cement, and sugar plants.³⁵⁰ In the financial year ending 31 March 2022, WIL reported a loss of INR 380.7 million (4.7 million USD).³⁵¹

Contact

Walchandnagar Industries Ltd.
3 Walchand Terraces,
Tardeo Road,
Mumbai – 400 034,
India.
+91 (022) 23612195/96
Email: wil@walchand.com
Website: <https://www.walchand.com/>

NUCLEAR WEAPONS

Walchandnagar Industries Limited (WIL) produces the launch systems for India's Agni missiles.³⁵² Walchandnagar reports continued development in the missile sector, as well as for the Indian Navy's nuclear weapon launch system.³⁵³

INVESTMENTS

The following table lists investors with outstanding investments for the period 1 January 2020 - 1 October 2021. All figures are in USD millions.

TABLE 24: INVESTMENTS IN WALCHANDNAGAR INDUSTRIES

INVESTOR	COUNTRY	LOANS	SHAREHOLDING	GRAND TOTAL
KKR Group	United States	\$23.5		\$23.5
Lalitabai Lalchand Charity	India		\$0.3	\$0.3
GRAND TOTAL		\$23.5	\$0.3	\$23.7

Financiers and Profiteers

There are a total of 306 investors with financial relationships to at least one of the 24 nuclear weapon producing companies profiled in this report. By doing so, these financial institutions enable the activities carried out by these companies that support the maintenance, testing and modernization of nuclear weapons. While financiers that provide loans or underwrite bond issuances may in some cases exert some influence on the direction of a company by limiting the scope of their financing, most financing of nuclear weapon producing companies is listed for “general corporate purposes”. In other words, these funds are un-earmarked and there is no way to guarantee they are not facilitating nuclear weapon production. Moreover, even ‘earmarked’ funds tend to free other capital flows that companies can use at their discretion.

Investors can and should undertake efforts to influence a company's direction. Pressure from financial institutions can be effective in bringing about change. It has, for example, been cited as the reason that Serco, formerly involved in development of the UK nuclear arsenal, would no longer bid for any nuclear weapon related contracts.³⁵⁴

Nuclear weapon producing companies included in this financial analysis present a significant, but not exhaustive review of the nuclear weapon industry. The 24 companies included are all publicly traded and have multi-year contracts for key components or services that contribute to activities prohibited under the Treaty on the Prohibition of Nuclear Weapons, including development, testing, production, manufacture, possession, stockpiling or use.

The financial information included here comprises financial institutions participating in loans and underwriting deals since 1 January 2020, as well as those involved in loans which have been closed before that date but have not yet matured before 1 October 2021. When it comes to investments in shares or bonds of the weapons

companies, a group-level threshold of at least 0.5% of the outstanding shares or bonds at most recent filing dates is applied per financial institution. The data was collected in June 2022, meaning the most recent filing date in many cases was March, 31st, 2022.

Key findings

\$747 billion invested in 24 nuclear weapon producing companies.

\$746,677 million was made available to the nuclear weapons producing companies between January 2020 and July 2022. This is an increase of \$61.5 billion since the last Don't Bank on the Bomb financial analysis in November 2021.

Taken together, share- and bondholding represent the majority of total investments, with a smaller portion in loans and underwriting.

Total number of investors, countries of origin

There are a total of 306 investors with financial relationships to the nuclear weapon producing companies, from 28 countries. Most of these investments come from countries that either possess nuclear weapons of their own or otherwise endorse the use of nuclear weapons. With the exception of three financial institutions (from South Africa and Chile), none of the investors come from countries that have joined the TPNW.

INVESTOR PARENT COUNTRY	TOTAL NUMBER OF INVESTORS	TOTAL INVESTMENTS (USD MILLIONS)	PERCENTAGE OF TOTAL
Australia	8	\$5,579	0.75%
Bahrain	1	\$88	0.01%
Bermuda	2	\$1,221	0.16%
Canada	12	\$26,383	3.53%
Chile	1	\$20	0.00%
China	15	\$4,301	0.58%
Denmark	1	\$290	0.04%
France	6	\$35,920	4.81%
Germany	9	\$17,307	2.32%
Hong Kong	2	\$342	0.05%
India	13	\$1,099	0.15%
Italy	10	\$7,331	0.98%
Japan	9	\$45,906	6.15%
Luxembourg	1	\$2,256	0.30%
Netherlands	2	\$826	0.11%
Norway	1	\$2,652	0.36%
Russia	3	\$3,020	0.40%
Saudi Arabia	1	\$1,155	0.15%
Singapore	1	\$1,439	0.19%
South Africa	2	\$391	0.05%
South Korea	2	\$359	0.05%
Spain	5	\$13,910	1.86%
Sweden	2	\$349	0.05%
Switzerland	5	\$5,637	0.75%
Taiwan	4	\$92	0.01%
United Arab Emirates	2	\$1,497	0.20%
United Kingdom	19	\$25,399	3.40%
United States	167	\$541,907	72.58%
GRAND TOTAL	306	\$746,677	100.00%

TABLE 25: INVESTORS BY COUNTRY OF ORIGIN

Top 10 investors

The top 10 investors are all based in the United States. Their combined investments in the 24 nuclear weapon producing companies totals \$386,602 million, representing more than half of all outstanding investments.

Top 10 investors compared (all figures in USD millions)

INVESTOR	COUNTRY	2022	2021	CHANGE
Vanguard	United States	\$68.180	\$50.971	\$17.209
State Street	United States	\$57.012	\$45.564	\$11.448
Capital Group	United States	\$51.292	\$41.773	\$9.519
BlackRock	United States	\$48.052	\$40.711	\$7.341
Bank of America	United States	\$41.339	\$38.405	\$2.934
JPMorgan Chase	United States	\$29.428	\$30.407	-\$979
Citigroup	United States	\$27.251	\$33.343	-\$6.092
Wells Fargo	United States	\$22.582	\$22.604	-\$22
Wellington Management	United States	\$22.285	\$16.868	\$5.417
Morgan Stanley	United States	\$19.181	\$18.737	\$444
GRAND TOTAL		\$386,602	\$339,383	\$47,219

TABLE 26 TOP 10 INVESTORS IN NUCLEAR WEAPON PRODUCERS COMPARED. ALL FIGURES IN USD MILLIONS.

The top 10 investors, not including US based investors hold a combined investment of \$96,833 million.

INVESTOR	COUNTRY	AMOUNT (USD MILLIONS)
Mizuho Financial	Japan	\$12.900
BNP Paribas	France	\$12.701
Mitsubishi UFJ Financial	Japan	\$11.452
Deutsche Bank	Germany	\$11.448
SMBC Group	Japan	\$10.308
Crédit Agricole	France	\$9.141
Sun Life Financial	Canada	\$8.630
Royal Bank of Canada	Canada	\$7.989
Société Générale	France	\$6.736
Japan Mutual Aid Association of Public School Teachers	Japan	\$5.528
GRAND TOTAL		\$96,833

TABLE 27: TOP 10 NON-US INVESTORS. ALL FIGURES IN US MILLIONS

Divesting institutions

Overall, there are 49 new financial institutions with investment in nuclear weapon producers, whereas 55 financial institutions divested in the previous year. The latter figure does not include those financial institutions with investments in Larsen & Toubro which, as a result of this company's removal from the full profile section, are no longer listed in this report. Divesting institutions came from the following countries: Bahrain (1) Belgium (1), Bermuda (1), Canada (5), China (1), France (6), Finland (1), India (1), Italy(1), Japan (1), Netherlands (1), Norway (1), Philippines (1), Portugal (1), Sweden (1) Switzerland (1), Taiwan (2), United Arab Emirates (1), United Kingdom (6), and the United States (21).

INVESTOR	COUNTRY	TOTAL AMOUNT DIVESTED (IN USD MILLIONS)
Norges Bank	Norway	\$2,255,86
AXA	France	\$1,066,46
Caisse de dépôt et placement du Québec	Canada	\$1,059,27
Development Bank of Japan	Japan	\$300,00
Standard Life Aberdeen	United Kingdom	\$296,97
Oddo BHF	France	\$289,85
ISALT	France	\$284,87
Majedie Asset Management	United Kingdom	\$233,65
Hengistbury Investment Partners	United Kingdom	\$158,94
CSC Financial	China	\$157,12
GRAND TOTAL		\$6,102.98

TABLE 28 TOP 10 DIVESTING INSTITUTIONS 2021-2022

Types of investment compared

Overall bondholding value continued to decrease in 2022, with a drop of \$1 billion compared to the previous year. The total amount of shareholding value, on the other hand, went up again in 2022 after a reducing trend since at least 2019, with an increase of \$108.5 billion compared to the previous year.

The total value of loans extended dropped in 2022 with \$31.2 billion compared to the previous year after a steadily growing trend since at least 2019. Total underwriting also decreased, with a \$14.7 billion drop from 2021.

	2022	2021	2020	2019
Bondholding	\$6,749	\$7,819.7	\$9,180.4	\$25,552.6
Loans	\$180,208	\$211,398.8	\$180,778.3	\$142,606.5
Shareholding	\$454,413	\$345,919.2	\$413,339.9	\$544,704.6
Underwriting	\$105,307	\$120,045.8	\$42,751.9	\$35,576.7
Grand total	\$746,677	\$685,183.5	\$646,050.5	\$748,440.4

TABLE 29: TYPES OF INVESTMENTS COMPARED 2022-2019, ALL FIGURES IN USD MILLIONS

Shareholding

A look at the top 10 shareholders, all from the US, shows a \$70.4 billion growth in the total value of shares held in this group. Shareholding was the only type of investment to increase in the last year, with a total increase of \$108.5 billion.

INVESTOR	COUNTRY	2022	2021	CHANGE
Vanguard	United States	\$67.298	\$50.028	\$17.271
State Street	United States	\$56.721	\$45.194	\$11.527
Capital Group	United States	\$51.292	\$41.773	\$9.519
BlackRock	United States	\$47.997	\$40.651	\$7.346
Wellington Management	United States	\$22.229	\$16.817	\$5.412
Newport Group	United States	\$15.683	\$15.133	\$550
Bank of America	United States	\$13.383	\$6.101	\$7.282
Geode Capital Holdings	United States	\$12.511	\$8.411	\$4.100
Fidelity Investments	United States	\$12.024	\$7.779	\$4.245
T. Rowe Price	United States	\$9.820	\$6.710	\$3.110
GRAND TOTAL		\$308,960	\$238,597	\$70,363

TABLE 30: TOP 10 SHAREHOLDERS COMPARED, ALL FIGURES IN USD MILLIONS.

Bondholding

Bondholding values of the top 10 investors increased by \$124 million between 2021 and 2022, while overall bondholding fell by \$1 billion to \$6.7 billion.

INVESTOR	COUNTRY	2022	2021	CHANGE
Vanguard	United States	\$881	\$944	-\$63
TIAA	United States	\$499	\$571	\$499
State Farm	United States	\$449	\$284	\$165
Northwestern Mutual	United States	\$387	\$304	\$83
Prudential Financial (US)	United States	\$362	\$147	\$215
Pacific Century Group	Hong Kong	\$317	\$719	-\$402
Macquarie Group	Australia	\$275	\$340	-\$65
California Public Employees' Retirement System (CalPERS)	United States	\$258	\$0	\$258
White Mountains Insurance	Bermuda	\$256	\$260	-\$4
Baird	United States	\$225	\$217	\$8
GRAND TOTAL		\$3,910	\$3,786	\$124

TABLE 31: TOP 10 BONDHOLDERS COMPARED, ALL FIGURES IN USD MILLIONS.

Loans

Total loans offered (not including underwriting) to the nuclear weapon producing companies has decreased by more than \$31.2 billion, compared to the last year. The top 10 lenders have mostly demonstrated a reduced appetite for these nuclear weapon companies, with this group showing a nearly \$15 billion drop.

INVESTOR	COUNTRY	2022	2021	CHANGE
Bank of America	United States	\$16,026	\$19,493	-\$3,467
BNP Paribas	France	\$7,212	\$7,195	\$18
Citigroup	United States	\$18,773	\$24,247	-\$5,474
Crédit Agricole	France	\$4,989	\$6,109	-\$1,119
Deutsche Bank	Germany	\$5,408	\$6,817	-\$1,408
JPMorgan Chase	United States	\$12,880	\$14,208	-\$1,328
Mitsubishi UFJ Financial	Japan	\$8,033	\$9,264	-\$1,231
Mizuho Financial	Japan	\$8,323	\$8,683	-\$359
SMBC Group	Japan	\$6,232	\$6,519	-\$287
Wells Fargo	United States	\$11,324	\$11,636	-\$312
GRAND TOTAL		\$99,201	\$114,169	-\$14,968

TABLE 32: TOP 10 LENDERS COMPARED, ALL FIGURES IN USD MILLIONS.

Issuances

The total number of underwriting, or bond issuances, fell in the last year, from \$120 billion in 2021 to \$105 billion in 2022.

INVESTOR	COUNTRY	2022	2021	CHANGE
Bank of America	United States	11.931 \$	\$12.811	-880 \$
JPMorgan Chase	United States	9.729 \$	\$10.778	-1.049 \$
Citigroup	United States	8.478 \$	\$9.096	-618 \$
Morgan Stanley	United States	7.195 \$	\$9.837	-2.642 \$
Wells Fargo	United States	6.482 \$	\$6.921	-439 \$
Goldman Sachs	United States	6.341 \$	\$7.088	-747 \$
Deutsche Bank	Germany	6.035 \$	\$6.726	-691 \$
BNP Paribas	France	5.489 \$	\$5.143	346 \$
Mizuho Financial	Japan	4.577 \$	\$4.624	-48 \$
SMBC Group	Japan	4.076 \$	\$4.011	66 \$
GRAND TOTAL		70,333 \$	\$77,035	-6,702 \$

TABLE 33: TOP 10 BOND ISSUERS COMPARED, ALL FIGURES IN USD MILLIONS

Full investment table

The report does not include investments made by governments, universities, or churches, only financial institutions. This selection of financial institutions is limited by a reporting threshold. Only share and bond holdings larger than 0.5% of the total number of outstanding shares of the nuclear weapon producing companies are listed.

INVESTOR	GRAND TOTAL	COUNTRY	AEROLET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED	
Abu Dhabi Investment Authority	\$17,7	United Arab Emirates					\$17,7																				
Academy Securities	\$347,3	United States						\$171,0				\$62,5	\$40,0						\$2,9	\$33,8	\$37,1						
Adage Capital Partners	\$344,0	United States																						\$344,0			
Aditya Birla Capital	\$11,1	India					\$11,1																				
Aegon	\$280,5	Netherlands			\$200,5										\$60,0			\$20,0									
Affiliated Managers Group	\$1,725,6	United States			\$1,663,3									\$62,2													
Allianz	\$221,4	Germany									\$55,6			\$50,8			\$90,8								\$24,3		
Allspring Global Investments	\$310,5	United States													\$310,5												
Allstate	\$30,2	United States			\$30,2																						
Ally Financial	\$52,5	United States														\$52,5											
American Century Investments	\$213,0	United States	\$21,2											\$53,1	\$138,7												
American Equity	\$78,0	United States												\$16,0	\$42,0								\$20,0				
American Financial Group	\$40,0	United States																						\$40,0			
American National Insurance	\$14,3	United States									\$14,3																
Ameriprise Financial	\$5,283,5	United States	\$28,9		\$492,8								\$1,276,4						\$913,1	\$1,017,4	\$1,473,8				\$81,1		
Anima	\$14,6	Italy																\$14,6									
ANZ	\$1,904,8	Australia		\$75,6	\$90,5	\$225,0		\$540,5				\$210,9	\$443,3						\$67,3	\$33,8	\$55,0				\$163,0		
Apollo Global Management	\$50,0	United States	\$50,0																								
Apple Financial Holdings	\$67,0	United States										\$67,0															
Apto Partners	\$38,1	United States						\$38,1																			
AQR Capital Management	\$222,4	United States	\$19,9											\$98,7											\$103,8		
Arab Banking Corporation (Bank ABC)	\$88,3	Bahrain						\$88,3																			
Aristotle Capital Management	\$2,134,3	United States										\$1,018,8	\$1,115,5														
Arrowstreet Capital	\$18,3	United States	\$18,3																								
Artisan Partners	\$1,045,4	United States			\$484,1																			\$561,3			
AustralianSuper	\$237,0	Australia																					\$237,0				
Auto-Owners Insurance	\$14,6	United States									\$14,6																
Aviva	\$76,8	United Kingdom			\$36,8																			\$40,0			
Aware Super	\$0,7	Australia														\$0,6	\$0,1										
Baird	\$225,2	United States												\$84,1			\$121,4							\$19,7			
Balyasny Asset Management	\$98,1	United States	\$35,0											\$63,2													
Banca Monte dei Paschi di Siena	\$87,5	Italy																\$87,5									
Banca Passadore & C.	\$87,5	Italy																\$87,5									
Banca Popolare di Sondrio	\$158,5	Italy																\$158,5									
Banco Bilbao Vizcaya Argentaria (BBVA)	\$4,751,7	Spain		\$695,3				\$1,779,3				\$1,245,9	\$478,9		\$134,5			\$198,7							\$219,2		
Banco BPM	\$547,6	Italy																\$547,6									
Banco de Crédito e Inversiones	\$19,7	Chile										\$19,7															
Banco de Sabadell	\$75,6	Spain		\$75,6																							
Bancroft Capital (PA)	\$17,8	United States						\$17,8																			
Bancroft Group (CT)	\$20,3	United States						\$20,3																			
Bank of America	\$41,339,3	United States	\$341,7	\$321,6	\$1,723,7	\$802,3		\$7,617,3			\$1,421,7	\$5,036,1	\$6,371,1	\$904,4	\$571,4	\$3,608,0	\$1,619,6	\$419,6	\$3,355,8	\$2,185,4	\$4,150,6		\$610,4	\$278,6			
Bank of China	\$1,510,3	China		\$177,9				\$708,5					\$443,3					\$138,1						\$42,5			

INVESTOR	GRAND TOTAL	COUNTRY	AEROLET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
Bank of East Asia	\$25,8	Hong Kong										\$25,8														
Bank of New York Mellon	\$2.510,6	United States	\$53,4		\$433,9			\$88,3			\$212,5	\$173,3	\$680,3	\$67,6		\$306,9	\$78,1		\$80,0	\$33,8	\$145,0			\$157,6		
Barclays	\$5.255,0	United Kingdom		\$404,6	\$1.736,5			\$984,3					\$1.096,5		\$59,2	\$191,7		\$219,6	\$167,3		\$232,3				\$163,0	
BayernLB	\$478,0	Germany		\$253,5				\$108,5					\$116,0													
Beach Point Capital Management	\$50,0	United States	\$50,0																							
Bessemer Group	\$400,4	United States																		\$400,4						
Black Creek Investment Management	\$248,4	Canada			\$248,4																					
BlackRock	\$48.051,7	United States	\$507,8	\$3.439,0	\$3.898,5			\$4.830,7			\$481,5	\$2.641,7	\$5.714,7	\$978,5	\$838,7	\$2.542,1	\$1.549,2	\$44,5	\$5.954,7	\$2.898,1	\$7.934,0		\$2.501,7	\$1.074,7	\$221,7	
Blaylock Beal Van	\$101,1	United States						\$38,1				\$35,0							\$2,9							\$25,1
BMO Financial Group	\$1.793,0	Canada						\$1.184,6			\$241,4				\$134,5		\$212,6									\$20,0
BNP Paribas	\$12.701,2	France		\$1.216,1	\$376,2	\$888,3		\$3.996,6			\$1.398,6		\$1.333,2		\$743,8		\$107,0	\$678,1		\$230,6	\$720,6		\$658,0			\$354,4
Boston Private	\$96,9	United States									\$96,9															
BPER Banca	\$279,3	Italy																\$279,3								
Brown Advisory	\$462,1	United States														\$462,1										
Cabrera Capital	\$38,1	United States						\$38,1																		
California Public Employees' Retirement System (CalPERS)	\$603,4	United States			\$61,2									\$46,0		\$345,0	\$64,8		\$86,5							
Canara Bank	\$10,0	India						\$10,0																		
Capital Group	\$51.292,4	United States		\$3.852,8	\$3.198,0			\$850,3				\$2.468,1	\$2.586,8		\$1.570,5	\$5.377,3			\$8.609,1	\$5.567,2	\$11.704,5		\$5.270,6			\$237,2
Capital One Financial	\$741,5	United States	\$45,6									\$218,5		\$153,8			\$323,7									
Cassa Depositi e Prestiti	\$221,3	Italy																\$221,3								
CastleOak Securities	\$63,3	United States						\$38,1													\$25,1					
Cathay General Bancorp	\$45,3	United States	\$37,2									\$8,1														
Causeway Capital Holdings	\$103,9	United States															\$103,9									
Chang Hwa Commercial Bank	\$20,1	Taiwan										\$20,1														
Charles Schwab	\$4.814,7	United States	\$29,4					\$539,0			\$40,3			\$67,1	\$134,3	\$254,0	\$117,1		\$2.320,0		\$1.186,7			\$126,8		
Children's Investment Fund Management	\$1.757,6	United Kingdom																					\$1.757,6			
China Jianyin Investment	\$26,4	China							\$26,4																	
China Merchants Bank	\$1.035,8	China							\$1.035,8																	
China Southern Asset Management (CSAM)	\$25,5	China							\$25,5																	
CI Financial	\$96,3	Canada													\$96,3											
CIBC	\$668,3	Canada				\$225,0							\$443,3													
Cincinnati Financial	\$15,0	United States									\$15,0															
Citadel	\$133,3	United States									\$34,0		\$99,3													
Citigroup	\$27.251,3	United States		\$404,6	\$1.192,8	\$802,3		\$10.677,5			\$815,2	\$150,1	\$4.167,1			\$230,0	\$1.413,5	\$248,1	\$2.203,5	\$1.580,6	\$2.968,4			\$234,6	\$163,0	
Citizens Financial Group	\$253,6	United States	\$45,6									\$73,6			\$134,5											
CL King & Associates	\$53,0	United States						\$38,1											\$2,9		\$12,0					
Clark Capital Management Group	\$19,3	United States												\$19,3												
Comerica	\$240,2	United States									\$116,4			\$66,7		\$57,1										
Commerzbank	\$3.975,0	Germany		\$612,6	\$307,2			\$2.337,8										\$252,1							\$465,3	

INVESTOR	GRAND TOTAL	COUNTRY	AEROLET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
Commonwealth Bank of Australia	\$75,6	Australia		\$75,6																						
Congress Asset Management Company	\$92,7	United States												\$92,7												
Cooke & Bieler	\$266,7	United States												\$93,1			\$173,6									
Corsair Capital Management	\$470,1	United States			\$470,1																					
Crédit Agricole	\$9,141,4	France		\$2,262,8	\$90,5	\$508,3		\$2,570,6					\$449,9					\$674,5	\$995,2		\$292,3		\$658,0		\$639,4	
Crédit Mutuel CIC Group	\$1,801,9	France		\$331,3	\$90,5	\$225,0						\$166,3				\$57,1		\$138,1	\$50,0				\$278,3		\$465,3	
Credit Suisse	\$1,719,8	Switzerland		\$253,5				\$1175,4										\$20,9		\$90,0	\$180,0					
D.E. Shaw & Co.	\$21,9	United States	\$21,9																							
Danske Bank	\$289,7	Denmark		\$75,6									\$214,2													
DBS	\$1,438,7	Singapore		\$253,5				\$810,3					\$374,9													
Deka Group	\$526,7	Germany		\$526,7																						
Desjardins Group	\$2,8	Canada													\$2,8											
Deutsche Bank	\$11,448,0	Germany		\$638,6	\$307,2			\$4,085,9					\$2,658,6		\$5,0	\$274,2		\$138,1			\$2,392,2		\$593,9		\$354,4	
Diamond Hill Investment Group	\$299,5	United States														\$299,5										
Dimensional Fund Advisors	\$1,111,8	United States	\$66,5				\$6,2				\$46,7			\$73,9	\$139,3	\$253,9	\$207,8	\$94,7						\$222,9		
Dodge & Cox	\$3,786,5	United States																			\$3,786,5					
Donghai Securities	\$66,7	China							\$66,7																	
Drexel Hamilton	\$76,0	United States						\$38,1				\$35,0							\$2,9							
DZ Bank	\$253,5	Germany		\$253,5																						
EFG International	\$113,0	Switzerland																\$113,0								
Elara Capital	\$41,2	United Kingdom					\$41,2																			
Empyrean Capital Partners	\$153,4	United States													\$153,4											
Equitable Holdings	\$1,166,6	United States			\$27,0										\$144,2						\$871,2			\$124,2		
ETF Managers Group	\$76,6	United States															\$76,6									
European Investment Bank	\$2,255,6	Luxembourg		\$947,0														\$710,1					\$598,5			
Export-Import Bank of the United States	\$350,0	United States																						\$350,0		
Federated Investors	\$187,4	United States			\$167,5									\$19,8												
Fidelity Investments	\$12,024,2	United States		\$1,159,7	\$264,4			\$2,584,4			\$283,8	\$677,7		\$354,7		\$432,8	\$93,6		\$1,771,5	\$2,588,1	\$1,324,1		\$391,7	\$97,7		
Fiera Capital	\$12,1	Canada													\$12,1											
Fifth Third Bancorp	\$706,2	United States	\$45,6								\$125,0	\$245,3		\$66,7			\$173,7		\$50,0							
Findlay Park Partners	\$336,2	United Kingdom													\$336,2											
First Abu Dhabi Bank	\$1,479,0	United Arab Emirates			\$901,3			\$241,8				\$210,9				\$125,0										
First Capital Securities	\$45,0	China						\$45,0																		
First Financial Holding	\$32,1	Taiwan										\$32,1														
First Horizon	\$245,4	United States												\$245,4												
First Seafont Fund Management	\$14,0	China						\$14,0																		
First Trust Advisors	\$603,0	United States										\$353,1					\$249,9									
Fisher Investments	\$799,1	United States																			\$799,1					
Franklin Resources	\$8,786,3	United States			\$1,097,6						\$53,8	\$483,4	\$1,033,0	\$45,4	\$27,0	\$605,0	\$20,0		\$1,015,5	\$809,6	\$3,566,6			\$29,3		
Fullgoal Fund Management	\$38,3	China						\$38,3																		
Fuyo General Lease	\$156,7	Japan										\$156,7														

INVESTOR	GRAND TOTAL	COUNTRY	AEROJET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
Gabelli Funds	\$399,2	United States	\$188,1																					\$211,0		
Gamco Investments	\$20,3	United States	\$20,3																							
Geode Capital Holdings	\$12.511,0	United States	\$50,0		\$165,3			\$1.697,1			\$71,4	\$910,4	\$2.288,3	\$153,5	\$339,7	\$837,2	\$299,0		\$1.850,3	\$1130,0	\$2.401,6			\$317,2		
GF Securities	\$26,1	China							\$26,1																	
Goldman Sachs	\$13.293,2	United States		\$2.913,3	\$307,2			\$3.594,5			\$116,4	\$150,1	\$2.737,2				\$457,9	\$167,5	\$288,7	\$185,6	\$2.170,2			\$204,6		
Government Pension Fund Global	\$2.652,3	Norway					\$4,8					\$473,2				\$314,6	\$126,6	\$48,3			\$1.464,0				\$220,8	
Government Pension Investment Fund (GPIF)	\$3.879,8	Japan						\$880,7					\$1.279,0	\$66,1	\$111,8	\$284,1	\$126,5				\$766,8		\$285,7	\$79,1		
GQG Partners	\$763,4	United States																	\$763,4							
Granite Investment Partners	\$33,0	United States									\$33,0															
Grantham Mayo Van Otterloo & Co	\$234,7	United States																						\$234,7		
Great Pacific Securities	\$38,1	United States						\$38,1																		
Groupe BPCE	\$5.448,4	France		\$695,3				\$2.634,9				\$469,8						\$197,5					\$677,5	\$29,1	\$744,4	
Guardian Life Insurance Company of America	\$75,8	United States																		\$75,8						
Guggenheim Capital	\$151,0	United States			\$37,5												\$34,5	\$15,0						\$64,1		
Guzman & Co	\$38,1	United States						\$38,1																		
Hancock Whitney	\$193,3	United States												\$193,3												
Hankou Bank	\$66,7	China							\$66,7																	
HDFC Bank	\$175,3	India					\$175,3																			
Hoover Financial Advisors	\$57,9	United States												\$57,9												
Hotchkis & Wiley Capital Management	\$185,3	United States									\$185,3															
HSBC	\$3.945,4	United Kingdom		\$1.216,1	\$225,0								\$394,9	\$193,7	\$287,1		\$396,1				\$90,0		\$788,1		\$354,4	
Hua Nan Financial	\$12,9	Taiwan										\$12,9														
Hubei Bank	\$66,7	China							\$66,7																	
Hubei Juyuan Technology Investment	\$64,1	China							\$64,1																	
Iberia Bank	\$20,1	United States									\$20,1															
ICICI Bank	\$277,8	India						\$277,8																		
IDBI Bank	\$41,2	India					\$41,2																			
IFS Group	\$19,0	United States						\$19,0																		
Industrial and Commercial Bank of China	\$1.150,8	China		\$253,5				\$367,9					\$394,9	\$134,5												
ING Group	\$545,2	Netherlands		\$253,5							\$291,7															
Intesa Sanpaolo	\$1.584,7	Italy				\$214,3		\$420,5					\$116,0				\$834,0									
Invesco	\$5.781,3	United States	\$19,5	\$989,0	\$1.527,8							\$430,6	\$142,3	\$107,6	\$298,0	\$160,5					\$1.328,1			\$777,9		
Jacobs Levy Equity Management	\$50,6	United States											\$50,6													
Janus Henderson	\$2.158,0	United Kingdom										\$495,7	\$729,4			\$850,1	\$82,7									
Japan Mutual Aid Association of Public School Teachers	\$5.527,9	Japan			\$166,3			\$868,1					\$1.109,7	\$65,8	\$178,7	\$469,3	\$86,4			\$457,1	\$1.288,9		\$760,7	\$76,9		
JPMorgan Chase	\$29.428,0	United States	\$45,6	\$1.138,3	\$90,5	\$439,3		\$7.804,2				\$3.314,0	\$2.644,3	\$862,9	\$59,2	\$230,0	\$1.554,1	\$305,5	\$2.203,5	\$3.030,9	\$5.050,3		\$436,3	\$219,2		
Jupiter Fund Management	\$357,3	United Kingdom			\$306,0									\$51,3												
KeyCorp	\$90,5	United States	\$45,6																		\$45,0					

INVESTOR	GRAND TOTAL	COUNTRY	AEROLET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
KfW	\$253,5	Germany		\$253,5																						
KKR Group	\$272,4	United States												\$248,9												\$23,5
Knights of Columbus	\$10,0	United States									\$10,0															
Kotak Mahindra Bank	\$43,9	India					\$43,9																			
La Caixa Group	\$110,7	Spain						\$110,7																		
Lalitabai Lalchand Charity	\$0,3	India																								\$0,3
Landesbank Baden-Württemberg (LBBW)	\$75,6	Germany		\$75,6																						
Landesbank Hessen-Thüringen	\$75,6	Germany		\$75,6																						
Länsförsäkringar	\$5,2	Sweden														\$5,2										
Lazard	\$965,5	Bermuda									\$44,8		\$920,7													
Legal & General	\$3.506,8	United Kingdom						\$536,5					\$908,8	\$52,3	\$121,1	\$285,7	\$106,5		\$608,0		\$783,6			\$104,3		
Life Insurance Corporation of India	\$82,9	India					\$82,9																			
Lloyds Banking Group	\$2.276,3	United Kingdom		\$248,8	\$307,2			\$467,9				\$801,0							\$451,4							
Lone Star Funds	\$163,2	United States		\$163,2																						
Loop Capital	\$190,3	United States						\$171,0													\$12,0			\$7,3		
Lord, Abnett & Co	\$164,8	United States									\$56,8			\$26,7		\$81,2										
LSV Asset Management	\$581,8	United States			\$211,6									\$234,3										\$135,8		
M&G	\$13,2	United Kingdom																	\$13,2							
Macquarie Group	\$1.738,9	Australia			\$78,4											\$35,1	\$27,7		\$84,0	\$701,6	\$762,0		\$50,0			
Madison Investments	\$89,3	United States													\$89,3											
Mahindra Finance	\$3,9	India					\$3,9																			
Manulife Financial	\$167,4	Canada		\$49,3										\$118,1												
MassMutual Holdings	\$122,7	United States		\$59,8																			\$62,9			
Masters Capital Management	\$28,7	United States									\$28,7															
MBS	\$38,1	United States						\$38,1																		
Mediobanca Banca di Credito Finanziario	\$138,1	Italy																	\$138,1							
Mega Financial	\$26,9	Taiwan									\$26,9															
Melqart Asset Management	\$26,7	United Kingdom	\$26,7																							
MetLife	\$191,7	United States			\$30,4									\$18,0	\$47,5	\$65,8							\$30,0			
MFR	\$50,1	United States						\$38,1													\$12,0					
Millennium Management	\$206,1	United States	\$180,5								\$25,6															
Mirae Asset Financial Group	\$99,5	South Korea													\$99,5											
Mischler Financial Group	\$71,0	United States						\$38,1											\$2,9	\$16,9	\$13,1					
Mitsubishi UFJ Financial	\$11.451,6	Japan	\$45,6	\$404,6	\$1171,5	\$508,3	\$2.352,9				\$1141,4	\$1.333,6	\$991,6	\$335,4	\$193,7	\$191,7	\$1.413,5	\$273,0	\$80,0	\$90,0	\$197,3	\$500,7	\$226,7			
Mizuho Financial	\$12.900,1	Japan		\$787,6	\$90,5		\$4.121,2					\$1.630,6	\$2.236,2	\$722,9		\$125,0	\$355,1		\$2.335,8	\$90,0	\$405,3					
Modern Woodmen of America	\$20,0	United States									\$10,0				\$10,0											
Morgan Stanley	\$19.181,0	United States	\$76,8	\$442,5	\$307,2		\$4.613,3				\$73,8		\$4.018,5	\$162,0	\$193,7	\$1.567,4		\$20,9	\$1.933,8	\$929,1	\$4.728,5			\$113,5		
National Pension Service	\$259,4	South Korea														\$259,4										
National Western Life Group	\$18,7	United States																						\$18,7		
Nationwide Mutual Insurance	\$91,1	United States												\$91,1												
NatWest	\$2.032,6	United Kingdom		\$661,7	\$307,2								\$624,1		\$59,2				\$335,5			\$45,0				
Neuberger Berman	\$754,1	United States																			\$754,1					

INVESTOR	GRAND TOTAL	COUNTRY	AEROJET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
New York Life Insurance	\$42,0	United States														\$42,0										
Newport Group	\$15.683,3	United States						\$8.332,2				\$4.092,7	\$3.258,3													
Nierenberg Investment Management	\$22,2	United States									\$22,2															
Ninety One	\$340,9	South Africa													\$340,9											
Nippon Life Insurance	\$9,2	Japan					\$9,2																			
Northern Trust	\$7.613,3	United States	\$27,4		\$810,8			\$947,7			\$48,2	\$898,0	\$1.233,8	\$52,8	\$172,5	\$509,1	\$269,6		\$1.030,1	\$415,8	\$1.049,3			\$148,3		
Northhill Capital	\$725,3	United Kingdom														\$725,3										
Northwestern Mutual	\$387,0	United States										\$75,0				\$205,9				\$106,0						
Novikombank	\$10,2	Russia																				\$10,2				
Nuance Investments	\$92,5	United States	\$92,5																							
OneAmerica Asset Management	\$75,0	United States									\$14,0				\$36,0									\$25,0		
Opus Corporate Finance LLP	\$37,2	United Kingdom	\$37,2																							
Orix Corporation	\$1.475,5	Japan										\$516,6					\$472,0							\$486,8		
Owl Creek Asset Management	\$27,3	United States	\$27,3																							
Pacific Century Group	\$316,6	Hong Kong		\$316,6																						
Pacific Mutual	\$45,5	United States												\$20,0			\$25,5									
Pendal Group	\$67,0	Australia												\$67,0												
Penserra Capital Management	\$41,0	United States						\$38,1											\$2,9							
People's Insurance Company	\$97,6	China							\$97,6																	
People's United Financial	\$40,2	United States									\$40,2															
Perpetual	\$239,2	Australia			\$239,2																					
PNC Financial Services	\$2.824,0	United States				\$214,3		\$670,2			\$541,2			\$153,8	\$393,7		\$319,6		\$50,0					\$481,3		
Power Financial Corporation	\$1.017,6	Canada													\$119,4	\$64,9			\$785,3					\$48,0		
Primecap Management	\$2.270,4	United States		\$945,5											\$907,9									\$417,0		
Principal Financial Group	\$77,7	United States	\$19,9				\$20,0								\$37,8											
Prudential Financial (US)	\$362,1	United States			\$132,9						\$62,3				\$2,8		\$69,9		\$94,1							
Prudential Plc	\$35,9	United Kingdom												\$17,5										\$18,4		
Pzena Investment Management	\$148,4	United States																						\$148,4		
Quaero Capital	\$0,9	Switzerland							\$0,9																	
R. Seelaus & Co	\$71,0	United States						\$55,0											\$2,9		\$13,1					
Raven's Wing Asset Management	\$7.245,7	United States										\$7.245,7														
Raymond James Financial	\$27,5	United States										\$27,5														
Regions Financial	\$960,1	United States	\$45,6								\$533,1	\$207,8					\$173,7									
Reinhart Partners	\$55,1	United States	\$55,1																							
Renaissance Technologies	\$30,9	United States									\$30,9															
Riyad Bank	\$1.155,5	Saudi Arabia						\$525,4											\$466,7		\$163,4					
Rothschild Group	\$91,5	France																						\$91,5		
Royal Bank of Canada	\$7.988,7	Canada	\$45,6	\$617,5	\$520,6			\$3.885,9			\$50,0	\$2.022,7	\$394,9			\$105,0	\$107,0		\$97,3		\$142,3					
Ruane, Cunniff & Goldfarb	\$400,4	United States													\$400,4											
Rubic Capital Management	\$93,4	United States									\$93,4															
Sanders Capital	\$1.487,2	United States																		\$1.487,2						
Santander	\$4.842,6	Spain		\$718,9				\$1.863,1					\$1.223,1					\$198,7					\$373,6		\$465,3	
SAR Holdings	\$38,1	United States						\$38,1																		

INVESTOR	GRAND TOTAL	COUNTRY	AEROLET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
Sather Financial	\$34,9	United States	\$34,9																							
Schweizerische Nationalbank	\$463,1	Switzerland						\$463,1																		
Scotiabank	\$2.906,0	Canada										\$746,4	\$254,9	\$522,9	\$193,7	\$296,7	\$639,3			\$33,8	\$218,4					
Securian	\$13,5	United States													\$13,5											
Select Equity Partners	\$801,4	United States													\$801,4											
Shank Williams Cisneros & Co	\$159,2	United States						\$100,3											\$2,9	\$16,9	\$29,1			\$10,0		
Shenwan Hongyuan Group	\$66,7	China							\$66,7																	
Silchester International Investors	\$919,6	United Kingdom			\$919,6																					
Skandinaviska Enskilda Banken	\$344,0	Sweden		\$253,5	\$90,5																					
SMBC Group	\$10.308,1	Japan	\$37,2	\$526,5	\$90,5	\$508,3		\$4.085,9			\$241,4	\$683,7	\$2.080,0			\$274,2	\$218,1	\$322,9	\$184,5	\$90,0	\$255,3		\$278,3	\$268,3	\$163,0	
Sociedad Estatal de Participaciones Industriales	\$4.129,6	Spain		\$4.129,6																						
Société Générale	\$6.735,9	France		\$1.789,6	\$376,2	\$214,3		\$1.964,3					\$973,9					\$495,5							\$567,7	\$354,4
Southern Farm Bureau Life Insurance	\$4,0	United States													\$4,0											
Sovcombank	\$10,2	Russia																				\$10,2				
Standard Bank	\$50,0	South Africa									\$50,0															
Standard Chartered	\$1.718,6	United Kingdom		\$75,6				\$590,5			\$216,4		\$394,9										\$278,3		\$163,0	
State Bank of India	\$368,7	India						\$288,3				\$80,4														
State Farm	\$449,2	United States			\$86,5						\$55,7		\$165,0		\$71,0					\$71,0						
State Street	\$57.011,7	United States	\$162,7		\$285,5			\$5.277,7			\$136,5	\$2.567,4	\$6.558,9	\$631,6	\$1.144,1	\$2.208,0	\$611,8		\$17.168,9	\$6.449,4	\$13.097,8				\$711,4	
Steel Partners Holdings	\$164,0	United States	\$164,0																							
Stern Brothers & Co	\$38,1	United States						\$38,1																		
Stifel Financial	\$334,4	United States										\$334,4														
Sumitomo Mitsui Trust	\$196,9	Japan													\$113,5		\$83,4									
Sun Life Financial	\$8.630,0	Canada										\$522,4	\$3.925,6			\$427,4	\$154,6		\$2.447,8	\$923,4			\$228,7			
Sundarm Finance Group	\$30,1	India					\$30,1																			
T. Rowe Price	\$9.820,2	United States		\$1.120,9				\$855,0					\$1.393,0		\$155,4	\$1.847,2	\$452,1	\$64,1						\$3.506,9	\$425,5	
Tata Group	\$13,1	India					\$13,1																			
TCW Group	\$45,2	United States			\$42,4										\$2,8											
Telsey Advisory Group	\$38,1	United States						\$38,1																		
The Hartford	\$47,7	United States			\$26,5																			\$21,3		
Thornburg Investment Management	\$17,7	United States												\$17,7												
Thrivent Financial	\$4,5	United States	\$4,5																							
TIAA	\$4.402,9	United States		\$477,1	\$67,8			\$776,3			\$22,3		\$921,3	\$51,9		\$113,0		\$30,0	\$154,8		\$1.323,8		\$249,5	\$215,1		
Toronto-Dominion Bank	\$2.851,9	Canada		\$253,5	\$90,5							\$400,7	\$1.053,9	\$153,8	\$193,7	\$205,0	\$173,7		\$184,5					\$142,7		
Travelers	\$15,0	United States													\$15,0											
Tribal Capital Markets	\$38,1	United States						\$38,1																		
Trinity Street Asset Management	\$178,8	United Kingdom			\$178,8																					
Truist Financial	\$989,2	United States	\$45,6					\$259,4				\$245,3		\$153,8	\$59,2	\$181,0					\$45,0					
Two Sigma Investments	\$141,2	United States	\$62,8								\$78,5															
UBS	\$3.340,4	Switzerland		\$75,6				\$465,9					\$686,0	\$359,5	\$2,8				\$703,8		\$1.046,7					
UniCredit	\$4.212,5	Italy		\$832,0									\$1.273,2					\$726,2	\$417,3	\$467,1	\$142,3				\$354,4	
Union Bankshares	\$6,8	United States										\$6,8														

INVESTOR	GRAND TOTAL	COUNTRY	AEROJET ROCKETDYNE	AIRBUS	BAE SYSTEMS	BECHTEL	BHARAT DYNAMICS LIMITED	BOEING	CHINA AEROSPACE SCIENCE AND TECHNOLOGY (CASC)	CONSTRUCTIONS INDUSTRIELLES DE LA MEDITERRANEE	FLUOR	GENERAL DYNAMICS	HONEYWELL	HUNTINGTON INGALLS INDUSTRIES	JACOBS ENGINEERING	L3 HARRIS TECHNOLOGIES	LEIDOS	LEONARDO	LOCKHEED MARTIN	NORTHROP GRUMMAN	RAYTHEON TECHNOLOGIES CORP	ROSTEC	SAFRAN	TEXTRON	THALES	WALCHANDNAGAR INDUSTRIES LIMITED
Unum Group	\$50,0	United States			\$30,0																		\$20,0			
US Bancorp	\$4.851,4	United States	\$45,6					\$544,7			\$216,4	\$526,2	\$853,9	\$722,9	\$193,7	\$296,7	\$323,7		\$538,7	\$90,0	\$308,4			\$190,6		
Van Eck Associates Corporation	\$30,5	United States									\$30,5															
Vanguard	\$68.179,5	United States	\$322,0	\$1.664,9	\$977,6			\$8.690,8			\$380,8	\$4.902,3	\$11.581,3	\$1103,0	\$1.929,2	\$4.374,7	\$1.677,8	\$111,7	\$9.966,7	\$5.404,0	\$11.957,7		\$1.018,6	\$1.766,8	\$349,4	
Veritas Capital Fund Management	\$110,6	United States												\$110,6												
Victory Capital	\$904,7	United States															\$432,0						\$20,0	\$452,7		
Virtus Investment Partners	\$16,5	United States												\$16,5												
Voya Financial	\$18,1	United States	\$18,1																							
VTB Group	\$3.000,0	Russia																				\$3.000,0				
Water Island Capital	\$28,6	United States	\$28,6																							
Wedge Capital Management	\$45,9	United States												\$45,9												
Wellington Management	\$22.284,9	United States		\$866,4	\$475,8						\$385,9	\$3.968,9	\$2.857,1			\$1.370,1	\$630,3		\$1.900,2	\$3.880,0	\$5.454,1		\$261,7		\$234,7	
Wells Fargo	\$22.582,4	United States	\$45,6		\$520,6			\$6.444,6			\$523,6	\$4.259,1	\$2.546,3	\$722,9	\$743,8	\$1.510,8	\$492,7		\$1.444,0	\$1.676,2	\$1.508,2			\$144,1		
Westchester	\$63,4	United States												\$63,4												
Westpac	\$1.316,2	Australia		\$75,6				\$854,3					\$386,4													
White Mountains Insurance	\$255,9	Bermuda		\$90,9	\$88,2										\$27,9	\$48,9										
Woodforest National Bank	\$33,4	United States									\$33,4															
Yes Bank	\$41,2	India					\$41,2																			
Zions Bancorporation	\$45,6	United States	\$45,6																							
Grand total	\$746.672		\$3.484,0	\$43.818,0	\$30.745,7	\$6.000,0	\$541,7	\$127.508,2	\$1.639,8	\$0,9	\$10.685,8	\$60.911,9	\$96.446,6	\$12.463,6	\$15.803,9	\$36.467,2	\$18.954,5	\$10.197,9	\$72.662,6	\$47.595,9	\$103.898,6	\$3.020,5	\$20.863,4	\$15.448,8	\$7.494,0	\$23,7

Conclusion

Nuclear weapons remain the most destructive, inhumane and indiscriminate weapons ever created. As we find ourselves amid rising global tensions and unprecedented risks of nuclear escalation since the Cuban Missile crisis, the need for disarmament has never been so urgent.

The strong condemnations of nuclear threats and firm commitments made at the First Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons in June this year, are reflective of a new global alliance, ready to take concrete steps towards a nuclear weapons free world.

Financial institutions can and should play a role in bringing about positive change. Through divestment, nuclear weapon producers can be pressured to cut the production of these weapons of mass destruction from their business strategies and, in turn, will make it more difficult for nuclear armed states to maintain their arsenals.

List of Tables

Table 1: Investments in Aerojet Rocketdyne Holdings, Inc	21
Table 2: Investments in Airbus Group	22
Table 3: Investments in BAE Systems	24
Table 4: Investments in Bechtel	26
Table 5: Investments in Bharat Dynamics Limited	27
Table 6: Investments in Boeing	29
Table 7: Investments in CASC	31
Table 8: Investments in Constructions Industrielles de la Méditerranée (CNIM)	32
Table 9: Investments in Fluor	33
Table 10: Investments in General Dynamics	35
Table 11: Investments in Honeywell International	38
Table 12: Investments in Huntington Ingalls Industries	41
Table 13: Investments in Jacobs Engineering	43
Table 14: Investments in L3 Harris Technologies	45
Table 15: Investments in Leidos	47
Table 16: Investments in Leonardo	49
Table 17: Investments in Lockheed Martin	52
Table 18: Investments in Northrop Grumman	54
Table 19: Investments in Raytheon	56
Table 20: Investments in Rostec	58
Table 21: Investments in Safran	59
Table 22: Investments in Textron	61
Table 23: Investments in Thales	63
Table 24: Investments in Walchandnagar Industries	65
Table 25: Investors by country of origin	67
Table 26 Top 10 investors in nuclear weapon producers compared	68
Table 27: Top 10 Non-US investors	68
Table 28 Top 10 Divesting institutions 2021-2022	68
Table 29: Types of investments compared 2022-2019	69
Table 30: Top 10 Shareholders compared	69
Table 31: Top 10 Bondholders compared	69
Table 32: Top 10 lenders compared	69
Table 33: Top 10 Bond issuers compared	70

Endnotes

- 1 In September 2022, Groupe REEL completed its acquisition of CNIM Systèmes Industriels. See *Groupe REEL takes over CNIM Systèmes Industriels* (press release), REEL International, 28 September 2022. Available at: <https://www.reelinternational.com/en/actualites/groupe-reel-takes-over-cnim-systemes-industriels/>.
- 2 United Nations General Assembly (UNGA), *Treaty on the Prohibition of Nuclear Weapons*, 17 July 2017, Article 1(d).
- 3 Alicia Sanders-Zakre and Susi Snyder (2022) 'Squandered: 2021 Global Nuclear Weapons Spending'. ICAN. Available at: https://assets.nationbuilder.com/ican/pages/2873/attachments/original/1655145777/Spending_Report_2022_web.pdf?1655145777.
- 4 *Northrop Grumman Completes Orbital ATK Acquisition, Blake Larson Elected to Lead New Innovation Systems Sector*. Northrop Grumman, 6 June 2018. Available at: <https://news.northropgrumman.com/news/releases/northrop-grumman-completes-orbital-atk-acquisition-blake-larson-elected-to-lead-new-innovation-systems-sector>.
- 5 *United Technologies and Raytheon Complete Merger of Equals Transaction*. Raytheon Technologies, 3 April 2020. Available at: <https://www.rtx.com/news/2020/04/03/united-technologies-and-raytheon-complete-merger-of-equals-transaction>.
- 6 *L3Harris Technologies Merger Successfully Completed; Board of Directors, Leadership and Organization Structure Announced* (press release). L3 Harris, 1 July 2019. Available at: <https://www.l3harris.com/newsroom/press-release/2019/07/l3harris-technologies-merger-successfully-completed-board-directors>.
- 7 *Lockheed Martin Terminates Agreement to Acquire Aerojet Rocketdyne*. Lockheed Martin, 13 February 2022. Available at: <https://news.lockheedmartin.com/2022-02-13-Lockheed-Martin-Terminates-Agreement-to-Acquire-Aerojet-Rocketdyne>;
- 'Lockheed scraps \$4.4 billion deal to buy Aerojet amid regulatory roadblocks', *Reuters*, 14 February 2022. Available at: <https://www.reuters.com/business/aerospace-defense/lockheed-martin-terminates-44-bln-deal-acquire-aerojet-rocketdyne-2022-02-13/>.
- 8 *NNSA announces contract extension to Consolidated Nuclear Security for the management and operation of the Y-12 National Security Complex and the Pantex Plant*. National Nuclear Security Administration, 3 October 2022. Available at: <https://www.energy.gov/nnsa/articles/>

[nnsa-announces-contract-extension-consolidated-nuclear-security-management-and-](https://www.energy.gov/nnsa/articles/nnsa-announces-contract-extension-consolidated-nuclear-security-management-and-)

9 'Nuclear defense agency jettisons federal defense contractor at Y-12 over safety concerns', *knox news*, 2 July 2020. Available at: <https://eu.knoxnews.com/story/news/2020/07/02/national-nuclear-security-administration-not-renew-y-12-contract-consolidated-nuclear-security/3259409001/>;

'Preliminary Notice of Violation' (2021). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/prod/files/2020/04/f73/Preliminary%20Notice%20of%20Violation%2C%20Consolidated%20Nuclear%20Security%2C%20LLC.pdf>.

10 'FY2019 Performance Evaluation Summary' (2020). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/prod/files/2020/06/f76/CNS%20FY2019%20PES%20-%2012%20Jun%202020.pdf>

11 *NNSA Awards Management and Operations Contract for Y-12, Pantex*. National Nuclear Security Administration, 29 November 2021. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-management-and-operations-contract-y-12-pantex>. Nuclear Production One is a limited liability company, and consists of Fluor Federal Services, Inc. and AECOM Energy & Construction (an Amentum company).

12 'Back to square one for \$28B nuclear management contract', *Washington Technology*, 17 May 2022. Available at: <https://washingtontechnology.com/contracts/2022/05/back-square-one-28b-nuclear-management-contract/367044/>;

NNSA cancels Y-12, Pantex contract award, to hold new competitions for separate site management contracts. National Nuclear Security Administration, 16 May 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-cancels-y-12-pantex-contract-award-hold-new-competitions-separate-site>.

13 Ben Gartside, 'Ethical investors block bid for nuclear weapons contracts', *The Telegraph*, 6 November 2021. Available at: <https://www.telegraph.co.uk/business/2021/11/06/ethical-investors-block-bid-nuclear-weapons-contracts/>.

14 *Financial Sector Addresses Inaugural TPNW Meeting*. ICAN, 11 July 2022. Available at: https://www.icanw.org/financial_sector_addresses_inaugural_tpnw_meeting.

15 'The French Duty of Vigilance Law: Frequently Asked Questions', *European Coalition of Corporate Justice (ECCJ)* (2017). Available at: <https://respect.international/wp-content/uploads/2017/10/french-corporate-duty-of-vigilance-law-faq.pdf> .

16 'Document d'enregistrement Universel 2021. Incluant le Rapport Financier Annuel', *Thales* (2022), p. 167. Available at: <https://vigilance-plan.org/company/thales/>.

17 *Supply chain act*. German Federal Government (2022) Available at: <https://www.bundesregierung.de/breg-en/federal-government/supply-chain-act-1872076> ;

'Germany's supply chain due diligence law: Frequently Asked Questions' *European Coalition of Corporate Justice (ECCJ)* (2021). Available at: <https://corporatejustice.org/news/germanys-supply-chain-due-diligence-law-faqs/>.

18 'Wet verantwoord en duurzaam internationaal ondernemen', *ChristenUnie* (2022). Available at: <https://www.christenunie.nl/wvdio>.

19 *Corporate Sustainability Reporting (no date)* | *European Commission*. Available at: https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en .

20 REGULATION (EU) 2019/2088 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 November 2019, on sustainability related disclosures in the financial services sector, Articles 4 and 7. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2088&from=EN>.

21 Ibid, Articles 3, 5 and 6.

22 Ibid, Articles 4 (1)(b), 4(3) and 4(4).

23 *EU Taxonomy for sustainable activities (2022)* | *European Commission*. Available at: https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en .

24 'Final Report on Social Taxonomy', *Platform on Sustainable Finance (2022)*. Available at: https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/280222-sustainable-finance-platform-finance-report-social-taxonomy.pdf .

25 Etica Funds is an Italian asset management company that offers only sustainable and responsible mutual funds. Etica's mission is to "represent the values of ethical finance in financial markets and promote socially responsible investment and corporate social responsibility". Etica's mutual funds carefully select the companies they invest in, for example by excluding those involved in controversial activities or not respecting internationally accepted norms and conventions on human and labour rights.

26 The full Vienna Declaration and Action Plan can be found as part of the final report of the meeting, here: <https://undocs.org/en/TPNW/MSP/2022/6>.

27 Ibid.

28 'Fiscal Year 2022 Stockpile Stewardship and Management Plan' (2022). *National Nuclear Security Administration*, p. E-8. Available at: <https://www.energy.gov/sites/default/files/2022-03/FY%202022%20SSMP%20March%202022.pdf>.

29 'INTEGRATED REPORT 2020-21', *Larsen & Toubro (2022)*, p. 88. Available at: [L&T Integrated Report 2020-21 | Sustainable progress for a better world \(windows.net\)](https://www.larsentoubro.com/~/media/Reports/2020-21-Integrated-Report.pdf).

30 *Groupe REEL takes over CNIM Systèmes Industriels* (press release), REEL International, 28 September 2022. Available at: <https://www.reelinternational.com/en/actualites/groupe-reel-takes-over-cnim-systemes-industriels/>.

31 *Defense and Security (2022)* | *CNIM Systèmes Industriels*. Available at: <https://cnim-systemes-industriels.com/en/businesses/defense-security-and-digital-intelligence#deterrent-systems>.

32 *Defense (2021)* | *REEL International*. Available at: <https://www.reelinternational.com/en/industries/defense-2/>.

33 *Veritas Capital Completes Acquisition of Northrop Grumman's IT and Mission Support Services Business*. Business Wire, 1 February 2021. Available at: <https://www.businesswire.com/news/home/202102101005535/en/Veritas-Capital-Completes-Acquisition-of-Northrop-Grumman%E2%80%99s-IT-and-Mission-Support-Services-Business>.

34 *CONTRACT to PERATON INC.* | *USAspending*, 5 April 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_FA873021F8503_9700_47QTCK18D0011_4732 (Accessed: 6 October 2022).

35 *Amentum Launches as Independent Professional and Technical Services Company Serving the U.S. Federal Government, Select Allied Governments, and Commercial Markets, Amentum, 4 February 2020*. Available at: <https://www.amentum.com/2020/02/04/amentum-launches-as-independent-professional-and-technical-services-company-serving-the-u-s-federal-government-select-allied-governments-and-commercial-markets/>.

36 *Team (no date)* | *Lawrence Livermore National Security, LLC* Available at: <https://www.llnslc.com/#team> (Accessed: 20 October 2022).

37 *Supporting Our Nation's Weapons Defense System with Advanced Conduct of Operations and Best-in-Class Operational Readiness at Los Alamos National Laboratory (LANL)*. Amentum, 1 April. Available at: <https://www.amentum.com/project/supporting-our-nations-weapons-defense-system-with-advanced-conduct-of-operations-at-los-alamos-national-labs/>

38 *Amentum Awarded \$22 Million Contract for Research, Development, Testing and Evaluation Services at NSWC Crane*. Amentum, 8 December 2020. Available at: <https://www.amentum.com/2020/12/08/amentum-awarded-22-million-contract-for-research-development-testing-and-evaluation-services-at-nswc-crane/>

39 *Nuclear Operations & Processing (2022)* | Amentum. Available at: <https://www.amentum.com/nuclear-operations-processing/>

40 *Amentum Launches as Independent Professional and Technical Services Company Serving the U.S. Federal Government, Select Allied Governments, and Commercial Markets*. Amentum, 4 February 2020. Available at: <https://www.amentum.com/2020/02/04/amentum-launches-as-independent-professional-and-technical-services-company-serving-the-u-s-federal-government-select-allied-governments-and-commercial-markets/>.

41 *Amentum Team Awarded \$28 Billion Y-12 National Security Complex and Pantex Plant Management Contract* (press release). Amentum, 30 November 2021. Available at: <https://www.amentum.com/amentum-team-awarded-28-billion-y-12-national-security-complex-and-pantex-plant-management-contract/>; *NNSA Awards Management and Operations Contract for Y-12, Pantex*. National Nuclear Security Administration, 29 November 2021. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-management-and-operations-contract-y-12-pantex>.

42 *NNSA cancels Y-12, Pantex contract award, to hold new competitions for separate site management contracts*. National Security Administration, 16 May 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-cancels-y-12-pantex-contract-award-hold-new-competitions-separate-site>.

43 *Contracts for July 18, 2022* (2022) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/3096893/> (Accessed: 25 October 2022).

44 *CONTRACT to ATLANTIC COMMTECH CORPORATION* | USAspending, 18 July 2022. Available at: https://www.usaspending.gov/award/CONT_AWD_FA942222C0004_9700_-NONE_-NONE (Accessed: 25 October 2022).

45 Hans Kristensen, 'Lakenheath Air Base Added To Nuclear Weapons Storage Site Upgrades', *Federation of American Scientists Blogs*, 11 April 2022. Available at: <https://fas.org/blogs/security/2022/04/lakenheath-air-base-added-to-nuclear-weapons-storage-site-upgrades/>.

46 *Contracts for September 9, 2016* (2016) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/939786/> (Accessed: 25 October 2022);

CONTRACT to ATLANTIC COMMTECH CORPORATION | USAspending, 12 September 2016. Available at: https://www.usaspending.gov/award/CONT_AWD_FA942216C8041_9700_-NONE_-NONE (Accessed: 25 October 2022).

47 *CONTRACT to BANDA GROUP INTERNATIONAL, LLC*. | USAspending, 16 January 2019. Available at: [CONTRACT to BANDA GROUP INTERNATIONAL, LLC | USAspending](https://www.usaspending.gov/award/CONT_AWD_FA942216C8041_9700_-NONE_-NONE) (Accessed: 25 October 2022).

48 *Technical & Management Services in Support of Defense Nuclear Safety* (2022) | *Banda Group International*. Available at: <https://bandagroupintl.com/project/technical-management-services-in-support-of-defense-nuclear-safety/>.

49 *National Laboratory Management and Operations* (2022) | *Battelle*. Available at: <https://www.battelle.org/laboratory-management>.

50 *About Us* (2022) | *Battelle*. Available at: <https://www.battelle.org/about-us>

51 *About* (2022) | *Consolidated Nuclear Security, LLC*. Available at: <https://cns-llc.us/about>.

52 *Contract No. DE-NA0001942* (2011) *Energy.gov*. Available at: <https://www.energy.gov/sites/prod/files/2018/02/f48/2014-03-25%2520Basic%2520Contract%5B1%5D.pdf> (Accessed: 26 October 2022).

53 *About Us* (2022) | *Draper*. Available at: <https://www.draper.com/about>

54 *Nine Decades of Innovation* (2022) | *Draper*. Available at: <https://www.draper.com/draper-history>.

55 *Trident II MARK 6 MOD 1 Guidance System* (2022) | *Draper*. Available at: <https://www.draper.com/explore-solutions/trident-ii-mark-6-mod-1-guidance-system>.

56 *Contracts for September 30, 2019* (2019) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1975222/> (Accessed: 26 October 2022).

57 *Contracts for February 15, 2019* (2019) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1759513/> (Accessed: 18 October 2021);

CONTRACT to CHARLES STARK DRAPER LABORATORY, INC., THE. | USAspending, 15 February 2019. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003019C0008_9700_-NONE_-NONE (Accessed: 26 October 2022);

Contracts for February 21, 2020 (2020) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2091020/> (Accessed: 18 October 2021);

Contracts for February 26, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2518088/> (Accessed: 26 October 2022); *CONTRACT to CHARLES STARK DRAPER LABORATORY, INC., THE*. | USAspending, 26 February 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003021C0008_9700_-NONE_-NONE (Accessed: 26 October 2022);

Contracts for February 10, 2022 (2022) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2931057/> (Accessed: 26 October 2022);

CONTRACT to CHARLES STARK DRAPER LABORATORY, INC., THE. | USAspending, 1 October 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003022C6002_9700_-NONE_-NONE (Accessed: 26 October 2022).

58 *Overall Information* (2017) | *China National Nuclear Corporation (CNNC), Expo 2017*. Available at: http://www.chinadaily.com.cn/m/2017Expochinaen/2017-06/05/content_29622565.htm (Accessed: 18 October 2021).

59 Ibid.

60 Brandi Vincent, 'Nuclear Security Agency Turns to \$600M Supercomputer for Weapons Readiness and Advancements', *Nextgov.com*, 13 August 2019. Available at: <https://www.nextgov.com/emerging-tech/2019/08/nuclear-security-agency-turns-600m-supercomputer-weapons-readiness-and-advancements/159128/>

61 *CONTRACT to HDT EXPEDITIONARY SYSTEMS, INC.* | USAspending, 22 May 2013. Available at: https://www.usaspending.gov/award/CONT_AWD_FA820413C0010_9700_-NONE_-NONE (Accessed: 27 October 2022)

62 *HDT GLOBAL AWARDED CONTRACT TO SUPPORT NORTHROP GRUMMAN IN U.S. AIR FORCE GROUND BASED STRATEGIC DETERRENT (GBSD) PROGRAM* (news story), HDT Global, 22 February 2022. Available at: <https://www.hdtglobal.com/2022/02/22/hdt-global-awarded-contract-to-support-northrop-grumman-in-u-s-air-force-ground-based-strategic-deterrent-gbsd-program/>

63 Chiara Vercellone, 'Northrop expands team for program to replace US Air Force ICBMs', *Defense News*. Available at: <https://www.defensenews.com/industry/2020/02/25/northrop-grumman-expands-team-for-program-to-replace-air-force-ballistic-missiles/>;

Northrop Grumman Successfully Conducted Major Milestone for Ground Based Strategic Deterrent Program (news story). Northrop Grumman Newsroom, 16 February 2021. Available at: <https://news.northropgrumman.com/news/releases/northrop-grumman-successfully-conducted-major-milestone-for-ground-based-strategic-deterrent-program>

64 *About L&T Group | L&T Corporate* (no date). Available at: [About L&T Group | L&T Corporate | L&T India \(larsentoubro.com\)](https://www.larsentoubro.com/about-lt-group/facilities/india/) (Accessed: 9 August 2022).

65 *New Construction - Defence Shipbuilding* | *Shipbuilding | L&T India* (no date). Available at: <https://www.lntshipbuilding.com/products-services/new-construction-defence-shipbuilding/> (Accessed: 5 October 2022).

66 'INTEGRATED REPORT 2020-21', Larsen & Toubro (2022), p. 88. Available at: [L&T Integrated Report 2020-21 | Sustainable progress for a better world](https://www.larsentoubro.com/corporate/about-lt-group/facilities/india/talegaon-maharashtra/) (windows.net).

67 *Talegaon, Maharashtra* (2022) | *Larsen & Toubro*. Available at: <https://www.larsentoubro.com/corporate/about-lt-group/facilities/india/talegaon-maharashtra/>.

68 'Defence Shipbuilding. End-to-end Solutions', *Larsen & Toubro*, p. 4. Available at: <https://corpwebstorage.blob.core.windows.net/media/42123/defence-shipbuilding-main-brochure.pdf>.

69 *Merrick-SMSI JV Team to Perform Project Planning and Engineering Services for Premier National Security Science Laboratory* (news story). Merrick, 10 July 2018. Available at: <https://www.merrick.com/merrick-jv-team-to-perform-project-planning-and-engineering-services/>.

70 'Fiscal Year 2021 Stockpile Stewardship and Management Plan' (2020). *National Nuclear Security Administration*, pp. E-17-E26. Available at: https://www.energy.gov/sites/default/files/2020/12/f82/FY2021_SSMP.pdf

71 *Merrick Opens South Carolina Office In Support of the Savannah River Site* (news story). Merrick, 21 August 2019. Available at: <https://www.merrick.com/merrick-opens-south-carolina-office-in-support-of-the-savannah-river-site/>.

72 *CONTRACT to MOOG INC.* | USAspending, 11 June 2020. Available at: https://www.usaspending.gov/award/CONT_IDV_FA821420D0001_9700 (Accessed: 27 October 2022).

73 *Thrust Vector Control Systems* (2022) | *Moog Inc.* Available at: <https://www.moog.com/products/actuation-systems/space/tvc-systems.html>

74 *Recent Financial Performance* (2022) | *Moog Inc.* Available at: <https://www.moog.com/investors/recent-financial-performance.html>

75 *Who we are* (no date) | *N3B Los Alamos*. Available at: [About Us | N3B - Los Alamos \(n3b-la.com\)](https://www.n3b-la.com/) (Accessed: 27 October 2022).

76 *Environmental Remediation and Waste Management* (no date) | *N3B - Los Alamos*. Available at: <https://www.n3b-la.com/> (Accessed: 27 October 2022).

77 Aaron Mehta, 'Northrop teams with Lockheed on ICBM replacement. Here's who else is involved', *Defense News*, 16 September 2019. Available at: <https://www.defensenews.com/digital-show-dailies/afa-air-space/2019/09/16/northrop-teams-with-lockheed-on-icbm-replacement-heres-who-else-is-involved/>

78 *Contracts for October 2, 2020* (2020) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2370617/> (Accessed: 27 October 2022);

Contracts for October 1, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2796431/> (Accessed: 27 October 2022);

CONTRACT to PERATON INC. | USAspending, 1 October 2020. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003021C0010_9700_-NONE_-NONE (Accessed: 27 October 2022).

79 *Veritas Capital Completes Acquisition of Northrop Grumman's IT and Mission Support Services Business*. Business Wire, 1 February 2021. Available at: <https://www.businesswire.com/news/home/20210201005535/en/Veritas-Capital-Completes-Acquisition-of-Northrop-Grumman%E2%80%99s-IT-and-Mission-Support-Services-Business>.

80 *CONTRACT to PERATON INC.* | USAspending, 5 April 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_FA873021F8503_9700_47Q_TCK18D0011_4732 (Accessed: 6 October 2022).

81 *IDV to PERATON INC.* | USAspending, 31 March 2021. Available at: https://www.usaspending.gov/award/CONT_IDV_FA820721D1001_9700 (Accessed: 25 November 2022); *Contracts for March 25, 2021 (2021) U.S. Department of Defense*. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2550918/> (Accessed: 25 November 2022).

82 *Safeguards, Security, and Emergency Services at NNSA U.S. Nuclear Sites Pantex and Y-12 (2022)* | SOC. Available at: <https://www.soc-usa.com/portfolio/security-operations-us-nuclear-sites>.

83 *About (2022)* | SOC. Available at: Available at: (Accessed: 27 October 2022).

84 Ross Wilkers, 'New \$22B Los Alamos management contract awarded', *Washington Technology*, 8 June 2018. Available at: <https://washingtontechnology.com/2018/06/new-22b-los-alamos-management-contract-awarded/347794/>.

85 *Projects (2022)* | Strategic Management Solutions LLC. Available at: <https://smsi.us/projects>.

86 Ibid.

87 *Contracts for October 1, 2020 (2020) U.S. Department of Defense*. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2369073/> (Accessed: 27 October 2022);

CONTRACT to SYSTEMS PLANNING AND ANALYSIS, INC. | USAspending, 1 October 2020. Available at: (Accessed: 27 October 2022),(Accessed: 27 October 2022).

88 *Contracts for March 27, 2020 (2020) U.S. Department of Defense*. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2129070/> (Accessed: 27 October 2022).

89 *Arlington Capital Partners Signs Definitive Agreement to Acquire Systems Planning & Analysis, Inc. and Combine it with MCR, LLC.* Businesswire, 6 October 2021. Available at: <https://www.businesswire.com/news/home/20211006005976/en/Arlington-Capital-Partners-Signs-Definitive-Agreement-to-Acquire-Systems-Planning-Analysis-Inc.-and-Combine-it-with->

[MCR-LLC](#).

90 *CHASSIS FOR THE TOPOL (no date)* | VOLAT. Available at: <https://www.mzkt.by/en/about/history/1915/> (Accessed: 25 November 2022).

91 *ABOUT US (no date)* | VOLAT. Available at: <https://www.mzkt.by/en/about/> (Accessed: 25 November 2022).

92 *LLNS BOARD OF GOVERNORS (no date)* | Lawrence Livermore National Security LLC. Available at: <https://www.llnslc.com/llns-board-governors> (Accessed: 27 October 2022).

93 Amy F. Woolf and James D. Werner (2021) 'The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites', *Congressional Research Service*, p. 14. Available at: <https://crsreports.congress.gov/product/pdf/R/R45306>

94 *About Sandia (2022)* | Sandia National Laboratories. Available at: <https://www.sandia.gov/about/>.

95 'W88 Alteration 370 Program' (2022). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/default/files/2022-01/W88-ALT370%20012422.pdf>.

96 'W76-1 Life Extension Program' (2019), *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/prod/files/2019/02/f59/02-13-2019-Factsheet-W76-1%20LEP.pdf>.

97 'W80-4 Life Extension Program' (2022), *National Nuclear Security Administration*. Available at: <https://www.energy.gov/nnsa/articles/w80-4-life-extension-program-lep-fact-sheet>.

98 'B61-12 Life Extension Program' (2021), *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/default/files/2021-12/B61-12%20Fact%20Sheet%20December%202021.pdf>.

99 *Roxel (2022)* | MBDA. Available at: <https://www.mbda-systems.com/polska/about-us/mbda-worldwide/roxel-2/>.

100 Ibid.

101 *Market Segments- Propulsion Systems (2022)* | Roxel Propulsion Systems. Available at: <https://www.roxelgroup.com/en/market-segments/>.

102 *About SRNS (2022)* | SAVANNAH RIVER NUCLEAR SOLUTIONS. Available at: <https://www.savannahrivernuclearsolutions.com/about/parent.htm>.

103 *Defense Programs (2020)* | Savannah River Site. Available at: <https://www.srs.gov/general/programs/dp/index.htm>.

104 'Plutonium Pit Production at SRS- Facts from the Savannah River Site' (2022), *U.S. Department of Energy*. Available at: https://www.srs.gov/general/news/factsheets/SRS_SRPPF_2022.pdf.

105 *Triad National Security takes the helm at Los Alamos National Laboratory*, Los Alamos National Laboratory, 1 November 2018. Available at: <https://discover.lanl.gov/news/1101-triad-takes-the-helm>.

106 Amy F. Woolf and James D. Werner (2021) 'The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites', *Congressional Research Service*, p. 13. Available at: <https://crsreports.congress.gov/product/pdf/R/R45306>

107 *Future Maritime Support Programme, Babcock International, 1 October 2021*. Available at: <https://www.babcockinternational.com/news/new-contract-for-naval-base-support-announced/>.

108 *Q3 Trading Statement 2017*, Babcock International, 28 February 2017. Available at: <https://www.babcockinternational.com/news/q3-trading-statement-2017/>.

109 *Babcock awarded multimillion pound missile tube contract extension by Electric Boat, Babcock International, 2 June 2020*. Available at: <https://www.babcockinternational.com/news/babcock-awarded-multimillion-pound-missile-tube-contract-extension-by-electric-boat/>.

110 *Contracts for September 21, 2017 (2017) U.S. Department of Defense*. Available at: https://www.usaspending.gov/award/CONT_AWD_FA873021F8503_9700_47Q_TCK18D0011_4732 (Accessed: 13 October 2022); *CONTRACT to ELECTRIC BOAT CORPORATION* | USAspending, 21 September 2017. Available at: [CONTRACT to ELECTRIC BOAT CORPORATION | USAspending](https://www.usaspending.gov/award/CONT_AWD_FA873021F8503_9700_47Q_TCK18D0011_4732) (Accessed: 13 October 2022).

111 'Defence Shipbuilding. End-to end Solutions', *Larsen & Toubro*, p. 4. Available at: <https://corpwebstorage.blob.core.windows.net/media/42123/defence-shipbuilding-main-brochure.pdf>.

112 *Arihant Class Submarine - Naval Technology (no date)*. Available at: <https://www.naval-technology.com/projects/arihant-class/> (Accessed: 10 October 2022); *Arihant Advanced Technology Vessel (ATV) – Armament (no date)* | *GlobalSecurity.org*. Available at: [Arihant Advanced Technology Vessel \(ATV\) - Armament \(globalsecurity.org\)](https://www.globalsecurity.org/military/aircraft/arihant-advanced-technology-vessel-atv-armament.htm) (Accessed: 8 November 2022).

113 Hans M. Kristensen and Matt Korda (2022) 'Indian nuclear weapons, 2022', *Bulletin of the Atomic Scientists*, 78:4, 224-236, p. 231. DOI: 10.1080/00963402.2022.2087385.

114 Gady, Franz-Stefan, 'India Test Fires Short-Range Ballistic Missiles From Submerged Sub', *The Diplomat*, 22 August 2018. Available at: <https://thediplomat.com/2018/08/india-test-fires-short-range-ballistic-missiles-from-submerged-sub/>.

115 *DCNS changes its name to Naval Group*. Naval Group, 28 June 2017. Available at: <https://www.naval-group.com/en/dcms-changes-its-name-naval-group-553>.

116 *Naval defence (2020)* | Naval Group. Available at: <https://www.naval-group.com/en/naval-defence-5>.

117 'LIBRE OPINION : Le SNLE Le Triomphant adapté au M51', *ASSOCIATION DE SOUTIEN À L'ARMÉE FRANÇAISE (ASAF)*, 23 August 2015. Available at: [LIBRE OPINION : Le SNLE Le Triomphant adapté au M51 \(asafrance.fr\)](http://www.asafrance.fr/);

'Projet de loi de finances pour 2015 : Défense : équipement des forces' (2014), *SÉNAT*, pp. 62-63. Available at: <http://www.senat.fr/rap/a14-110-8/a14-110-81.pdf>; *Naval defence (2020)* | Naval Group. Available at: <https://www.naval-group.com/en/naval-defence-5>.

118 'See France test-fire an M51 strategic missile into the Atlantic', *DefenseNews*, 28 April 2021. Available at: [See France test-fire an M51 strategic missile into the Atlantic \(defensenews.com\)](https://www.defensenews.com/defense/2021/04/28/see-france-test-fire-an-m51-strategic-missile-into-the-atlantic/).

119 'The United Kingdom's future nuclear deterrent: the 2019 update to Parliament' (2019) *GOV.UK*. Available at: <https://www.gov.uk/government/publications/the-united-kingdoms-future-nuclear-deterrent-the-2019-update-to-parliament/the-united-kingdoms-future-nuclear-deterrent-the-2019-update-to-parliament>.

120 'Notebook 2020 : International Defence Companies'(2019), *Direction générale de l'armement, DGA*, p. 175 Available at: https://archives.defense.gouv.fr/english/content/download/573555/9831497/Calepin_DGA_EDITION_2020_VA%20_17122019.pdf.

121 Ibid, p. 174.

122 'DEFENCE, AEROSPACE, MISSILES', *Walchandnagar Industries Limited* (2015), p. 9. Available at: <https://www.walchand.com/download.php?flp=http://www.walchand.com/wp-content/uploads/2015/07/WIL-Brochure-Defence-Aerospace-Missile-Reduced.pdf>.

123 'Arihant Class Submarine', *Naval Technology*, 19 August 2009. Available at: <https://www.naval-technology.com/projects/arihant-class/>.

124 Hans M. Kristensen and Matt Korda (2022) 'Indian nuclear weapons, 2022', *Bulletin of the Atomic Scientists*, 78:4, 224-236, p. 231. DOI: 10.1080/00963402.2022.2087385.

125 Gady, Franz-Stefan, 'India Test Fires Short-Range Ballistic Missiles From Submerged Sub', *The Diplomat*, 22 August 2018. Available at: <https://thediplomat.com/2018/08/india-test-fires-short-range-ballistic-missiles-from-submerged-sub/>.

126 Hans M. Kristensen and Matt Korda (2022) 'Indian nuclear weapons, 2022', *Bulletin of the Atomic Scientists*, 78:4, 224-236, p. 231. DOI: 10.1080/00963402.2022.2087385.

127 Sneesh, Alex Philip, 'Ballistic missile submarine Arighat in final stages of trials, to be commissioned early 2021', *ThePrint*, 16 December 2020. Available at: <https://theprint.in/defence/ballistic-missile-submarine-arighat-in-final-stages-of-trials-to-be-commissioned-early-2021/567869/>.

128 *About Us* (2022) | Aerojet Rocketdyne Holdings, Inc.. Available at: <https://www.aerocketrocketdyne.com/about-us>.

129 'Aerojet Rocketdyne Holdings, Inc. Annual Report on Form 10-K For the Year Ended December 31, 2021', *Aerojet Rocketdyne Holdings (2021), Inc.*, p. 26. Available at: <https://ir.aerocketrocketdyne.com/static-files/d3fafa83-96f7-4f85-ad1a-2b3744943514>.

130 'Aerojet Rocketdyne Holdings, Inc. Annual Report on Form 10-K For the Year Ended December 31, 2021', *Aerojet Rocketdyne Holdings (2021), Inc.*, p. 20. Available at: <https://ir.aerocketrocketdyne.com/static-files/d3fafa83-96f7-4f85-ad1a-2b3744943514>.

131 Ibid, p. 1; 'Lockheed scraps \$4.4 billion deal to buy Aerojet amid regulatory roadblocks', *Reuters*, 14 February 2022. Available at: <https://www.reuters.com/business/aerospace-defense/lockheed-martin-terminates-44-bin-deal-acquire-aerojet-rocketdyne-2022-02-13/>.

132 *Strategic Systems (2022)* | Aerojet Rocketdyne. Available at: [Strategic Systems | Aerojet Rocketdyne](#); *ICBM Post boost Vehicles (2022)* | Aerojet Rocketdyne. Available at: <https://www.rocket.com/defense/lgm-35a-sentinel/icbm-post-boost-vehicles>.

133 *Strategic Systems (2022)* | Aerojet Rocketdyne. Available at: [Strategic Systems | Aerojet Rocketdyne](#).

134 AEROJET ROCKETDYNE SELECTED TO POWER NATION'S NEXT GENERATION STRATEGIC DETERRENT, *Aerojet Rocketdyne*, 8 September 2020. Available at: [Aerojet Rocketdyne Selected to Power Nation's Next Generation Strategic Deterrent | Aerojet Rocketdyne Holdings, Inc. \(Accessed: 8 September 2022\)](#);

'Aerojet Rocketdyne Holdings, Inc. Annual Report on Form 10-K For the Year Ended December 31, 2020'. *Aerojet Rocketdyne Holdings, Inc (2020)*, p. 3. Available at: <https://ir.aerocketrocketdyne.com/node/25406/html>.

135 *Contracts for September 8, 2020* (2020) U.S. Department of Defense. Available at: [> U.S. Department of Defense > Contract](#) (Accessed: 8 September 2022).

136 *Contracts for January 16, 2018* (2018) U.S. Department of Defense. Available at: [> U.S. Department of Defense > Contract](#) (Accessed: 18 August 2022).

137 Aerojet Rocketdyne, '2019 Annual Report', *Aerojet Rocketdyne (2020)*. Available at: <https://ir.aerocketrocketdyne.com/static-files/eeac3738-afdd-4c4c-a417-aac182859420>.

138 *Airbus in Europe (2022)* | AIRBUS. Available at: <https://www.airbus.com/en/our-worldwide-presence/airbus-in-europe>.

139 *Who we are (2022)* | Airbus. Available at: [Who we are | Airbus](#).

140 *About us. Company profile* | ArianeGroup. Available at: [Company profile - ArianeGroup](#) (Accessed: 8 August 2022).

141 *About Us (2022)* | MBDA Systems. Available at: <https://www.mbda-systems.com/about-us/>.

142 'Airbus Financial Statements 2021', *Airbus (2021)*, p. 25. Available at: [AIRBUS FY2021 FINANCIAL STATEMENTS](#).

143 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 29. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>; *ASMPA (2022)* | MBDA Missile Systems. Available at: <https://www.mbda-systems.com/product/asmpa/>.

144 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 32. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

145 'MBDA opens data centre in France for missile development', *AIRFORCE TECHNOLOGY*, 5 April 2019. Available at: <https://www.airforce-technology.com/news/mbda-data-centre-france-missiles/>.

146 Tran, Pierre, 'France makes progress on refitting submarine for M51 missiles', *Defense News*, 23 July 2018. Available at: <https://www.defensenews.com/naval/2018/07/23/france-makes-progress-on-refitting-submarine-for-m51-missiles/>;

'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 34. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

147 *M51 (no date)* | ArianeGroup. Available at: <https://www.ariane.group/en/defense/m51/> (Accessed: 8 September 2022).

148 'Airbus and Safran Agree to Space Launcher Joint Venture', *DefenseNews*, 10 May 2016. Available at: <https://www.defensenews.com/space/2016/05/10/airbus-and-safran-agree-to-space-launcher-joint-venture/>; 'INDUSTRIAL ISSUES RELATING TO THE MODERNIZATION OF THE M51 BALLISTIC MISSILE OF THE STRATEGIC OCEAN FORCE', *Ariane Group, Summer Defence Conference (2017)*. Available at: https://www.universite-defense.org/en/publications/the_2017_position_papers/ariane-group.htm.

149 *What we do (2022)* | BAE Systems. Available at: [What we do | BAE Systems | International](#).

150 *About Us (2022)* | MBDA Missile Systems. Available at: <https://www.mbda-systems.com/about-us/>.

151 'Annual Report 2021' (2021), *BAE Systems plc*, p. 3. Available at: [bae-ar-complete-2021.pdf \(baesystems.com\)](#).

152 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 29. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

153 Ibid, p. 32.

154 'MBDA opens data centre in France for missile development', *AIRFORCE TECHNOLOGY*, 5 April 2019. Available at: <https://www.airforce-technology.com/news/mbda-data-centre-france-missiles/>.

155 *CONTRACT to BAE SYSTEMS TECHNOLOGY SOLUTIONS & SERVICES INC.* | USAspending, 1 August 2013. Available at: https://www.usaspending.gov/award/CONT_AWD_FA821413C0001_9700_-NONE_-NONE (Accessed: 10 October 2022).

156 *BAE Systems wins contract to continue sustaining U.S. intercontinental ballistic missiles*. *BAE Systems*, 27 June 2022. Available at: <https://www.baesystems.com/en-us/article/bae-systems-wins-contract-to-continue-sustaining-us-intercontinental-ballistic-missiles>; *Contracts for June 24, 2022* (2022) U.S. Department of Defense. Available at: [> U.S. Department of Defense > Contract](#) (Accessed: 11 October 2022).

157 *CONTRACT to BAE SYSTEMS TECHNOLOGY SOLUTIONS & SERVICES INC.* | USAspending, 1 October 2018. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003019C0007_9700_-NONE_-NONE (Accessed: 10 October 2022);

Contracts for September 16, 2020 (2020) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2350212//> (Accessed: 14 September 2022);

CONTRACT to BAE SYSTEMS TECHNOLOGY SOLUTIONS & SERVICES INC. | USAspending, 1 October 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003022C6001_9700_-NONE_-NONE (Accessed: 10 October 2022); *BAE Systems has been awarded a five-year Systems Engineering and Integration Support Services contract to continue supporting the U.S. Navy Strategic Systems Programs (SSP) office*, *BAE Systems*, 27 October 2021. Available at: <https://www.baesystems.com/en/article/bae-systems-was-awarded-a-five-year-systems-engineering-and-integration-support-services-contract>.

Contracts for October 21, 2022 (2022) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/3196439/> (Accessed: 7 November 2022).

158 *CONTRACT to BAE SYSTEMS TECHNOLOGY SOLUTIONS & SERVICES INC.* | USAspending, 1 October 2018. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003019C0007_9700_-NONE_-NONE (Accessed: 10 October 2022).

Contracts for September 16, 2020 (2020) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2350212//> (Accessed: 14 September 2022).

159 'Bechtel Report 2021. Partners in Progress', *Bechtel (2021)*. Available at: [2021-About-Bechtel.pdf](#).

160 *U.S. National Laboratories, New Mexico and California, USA* (2022) | *Bechtel*. Available at: <https://www.bechtel.com/projects/us-national-laboratories/>.

161 'Bechtel Report 2021. Partners in Progress', *Bechtel (2021)*. Available at: [2021-About-Bechtel.pdf](#).

162 *Bechtel Joins Northrop Grumman's Ground Based Strategic Deterrent Team*. *Bechtel*, 26 February 2020. Available at: <https://www.bechtel.com/newsroom/releases/2020/02/bechtel-joins-northrop-grumman-gbsd-team/>.

163 Amy F. Woolf and James D. Werner (2021) 'The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites', *Congressional Research Service*, p. 15. Available at: <https://crsreports.congress.gov/product/pdf/R/R45306>.

164 *CONTRACT to LAWRENCE LIVERMORE NATIONAL SECURITY LIMITED LIABILITY COMPANY.* | USAspending, 9 May 2007. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003019C0007_9700_-NONE_-NONE.

165 *usaspending.gov/award/CONT_AWD_DEAC5207NA27344_8900_-NONE_-NONE-* (Accessed: 11 October 2022).

165 NNSA Production Office contract (2014) Energy.gov. Available at: <https://www.energy.gov/nnsa/nnsa-production-office-contract> (Accessed: 14 September 2022);

U.S. Nuclear Security Enterprise (2022) | Bechtel (no date). Available at: <https://www.bechtel.com/projects/us-nuclear-security-enterprise/> (Accessed: 14 September 2022). 'CONTRACT to CONSOLIDATED NUCLEAR SECURITY LLC.' USAspending, 8 January 2013. Available at: https://www.usaspending.gov/award/CONT_AWD_DENA0001942_8900_-NONE_-NONE- (Accessed: 11 October 2022). Bechtel. Available at: <https://www.bechtel.com/projects/us-nuclear-security-enterprise/> ;

CONTRACT to CONSOLIDATED NUCLEAR SECURITY LLC. | USAspending, 8 January 2013. Available at: https://www.usaspending.gov/award/CONT_AWD_DENA0001942_8900_-NONE_-NONE- (Accessed: 11 October 2022).

166 Contract No. DE-NA0001942 (2014) Energy.gov. Section J, Appendix A, Page 1. Available at: <https://www.energy.gov/nnsa/downloads/contract-no-de-na0001942> (Accessed: 14 September 2022).

167 NNSA Awards Management and Operations Contract for Y-12, Pantex. Energy.gov, 29 November 2021. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-management-and-operations-contract-y-12-pantex>.

168 NNSA cancels Y-12, Pantex contract award, to hold new competitions for separate site management contracts. Energy.gov, 16 May 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-cancels-y-12-pantex-contract-award-hold-new-competitions-separate-site>.

169 NNSA announces contract extension to Consolidated Nuclear Security for the management and operation of the Y-12 National Security Complex and the Pantex Plant. Energy.gov, 3 October 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-announces-contract-extension-consolidated-nuclear-security-management-and> .

170 Company Profile (2022) | BHARAT DYNAMICS LIMITED INDIA. Available at: <https://bdl-india.in/company-profile> .

171 NSE - National Stock Exchange of India Ltd. (no date). Available at: https://www.nseindia.com/live_market/dynaContent/live_watch/get_quote/GetQuote.jsp?symbol=BDL&illiquid=0&smeFlag=0&itpFlag=0 (Accessed: 9 August 2022); Company Profile (2022) | Bharat Dynamics Limited. Available at: <https://bdl-india.in/company-profile>.

172 'BDL-2021-22 Q4 financial results', Bharat Dynamics Limited (2022). Annexure II. Available at: <https://bdl-india.in/sites/default/files/BDL%202021-22%20Q4%20Financial%20Results.pdf>.

173 Company Profile (2022) | BHARAT DYNAMICS LIMITED INDIA. Available at: <https://bdl-india.in/company-profile> ;

'Nuclear capable Prithvi-2 missile successfully testfired at night', *The Economic Times*, last updated: 20 November 2019. Available at: <https://economictimes.indiatimes.com/news/defence/nuclear-capable-prithvi-2-missile-successfully-testfired-at-night/articleshow/72147446.cms> ;

'India successfully tests nuclear-capable Agni-V ballistic missile | All you need to know', *INDIA TODAY*, updated: 8 October 2021. Available at: <https://www.indiatoday.com/story/india-successfully-tests-nuclear-capable-agni-v-ballistic-missile-all-you-need-to-know-1781447> ;

'52nd Annual Report 2021-22', *Bharat Dynamics Limited (2022)*, p. 7. Available at: <https://bdl-india.in/sites/default/files/Annual%20Report%202021-22.pdf> .

174 General Information (2022) | Boeing. Available at: <https://www.boeing.com/company/general-info/index.page> ; Defense (2022) | Boeing. Available at: <https://www.boeing.com/defense/#/overview> .

175 'The Boeing Company 2021 Annual Report'. *Boeing (2022)*, p. 16. Available at: https://s2.q4cdn.com/661678649/files/doc_financials/2021/ar/The-Boeing-Company-2021-Annual-Report.pdf .

176 Contracts for May 10, 2018 (2018) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/151814/> (Accessed: 7 November 2022);

CONTRACT to BOEING COMPANY, THE. | USAspending, 17 May 2018. Available at: https://www.usaspending.gov/award/CONT_AWD_FA811919F0094_9700_FA811914D0003_9700 (Accessed: 7 November 2022).

177 Contracts for April 26, 2019 (2019) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1825952/> (Accessed: 28 September 2022);

Definitive Contract FA210318C0061 - GovTribe (2021) GovTribe. Available at: <https://govtribe.com/award/federal-contract-award/definitive-contract-fa210318c0061> (Accessed: 11 October 2022);

'B61 Mod 12 Life Extension Program Tail Kit Assembly' - FY18 AIRFORCE PROGRAMS. Available at: <https://www.dote.osd.mil/Portals/97/pub/reports/FY2018/afi/2018b61.pdf?ver=2019-08-21-155843-557> (Accessed: 7 November 2022).

178 Contracts for March 13, 2019 (2019) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1784315/> (Accessed: 11 October 2022);

IDV to BOEING COMPANY, THE. | USAspending, 15 March 2019. Available at: https://www.usaspending.gov/award/CONT_AWD_IDV_TO_BOEING_COMPANY,_THE (Accessed: 11 October 2022).

179 Historical Snapshot: LGM- Minuteman Missile (2022) | Boeing. Available at: <https://www.boeing.com/history/products/lgm-30-minuteman.page> .

180 CONTRACT to BOEING COMPANY, THE | USAspending, 14 January 2015. Available at: https://usaspending.gov/award/CONT_AWD_FA821415C0001_9700_-NONE_-NONE- (Accessed: 11 October 2022).

181 Contracts for September 17, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2780513/> (Accessed: 28 September 2022);

IDV to BOEING COMPANY, THE | USAspending, 17 September 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_IDV_TO_BOEING_COMPANY,_THE (Accessed: 11 October 2022).

182 Contracts for April 29, 2022 (2022) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2518088/> (Accessed: 28 September 2022);

183 Definitive Contract N0003021C6002 - GovTribe (2021) GovTribe. Available at: <https://govtribe.com/award/federal-contract-award/definitive-contract-n0003021c6002> (Accessed: 18 September 2022);

CONTRACT to BOEING COMPANY, THE | USAspending, 1 October 2020. Available at: https://www.usaspending.gov/award/CONT_AWD_CONTRACT_TO_BOEING_COMPANY,_THE (Accessed: 11 October 2022);

Contracts for February 26, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2518088/> (Accessed: 28 September 2022);

Contracts for September 28, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2791886/> .

184 Company profile (2018) | China Aerospace Science and Technology Corporation. Available at: english.spacechina.com/n16421/n17138/n17229/index.html.

185 Ibid.

186 China Aerospace Science & Technology Company Profile, News, Rankings | *Fortune*. Available at: <https://fortune.com/company/china-aerospace-science-technology/global500/> (Accessed: 9 August 2022).

187 Lu Hui, 'China's National Defense in the New Era', *Xinhua Net*, 24 July 2019. Available at: http://www.xinhuanet.com/english/2019-07/24/c_138253389.htm .

188 Strategic Nuclear Missiles (2018) | China Aerospace Science and Technology Corporation. Available at: <http://english.spacechina.com/n16421/n17215/n17272/c2388530/content.html> .

189 About us (2016) | CNIM. Available at: <https://cnim.com/en/group/about-us>.

190 Defense and Security (2022) | CNIM Systèmes Industriels. Available at: <https://www.cnim-systemes-industriels.com/defense-security>.

191 'CNIM Groupe Universal Registration Document 2020', CNIM (2021). Available at: <https://cnim.com/sites/default/files/media/Finance/CNIM-DEU2020-EN.pdf> .

192 Groupe REEL takes over CNIM Systèmes Industriels, Groupe Reel, 28 September 2022. Available at: <https://www.cnim.com/sites/default/files/media/Actualite/C3%A9s/Communiqu%C3%A9%20de%20presse%20CNIM%20EN.pdf>.

193 About (2021) | REEL. Available at: <https://www.reelinternational.com/en/about/>.

194 Defense (2021) | REEL. Available at: <https://www.reelinternational.com/en/industries/defense-2/>.

195 Defense and Security (2022) | CNIM Systèmes Industriels. Available at: <https://www.cnim-systemes-industriels.com/defense-security>.

196 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 28. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

197 The Laser Megajoule: power and precision for French Deterrence (2022) | CNIM Systèmes Industriels. Available at: <https://www.cnim-systemes-industriels.com/content-realisation-dissuasion-en> | CNIM SI (cnim-systemes-industriels.com) (Accessed: 29 November 2022);

Defense and Security (2022) | CNIM Systèmes Industriels. Available at: <https://www.cnim-systemes-industriels.com/defense-security>.

198 Laser Mégajoule - Experiences (2022) | CEA. Available at: <http://www-lmj.cea.fr/lmj-applications-defense.html> .

199 The Laser Megajoule: power and precision for French Deterrence (no date) CNIM. Available at: <https://cnim.com/en/laser-megajoule-power-and-precision-french-deterrence> (Accessed: 29 September 2022).

200 Hans M. Kristensen and Matt Korda (2019) 'French nuclear forces, 2019', *Bulletin of the Atomic Scientists*, 75(1), pp. 51–55, p. 54. doi:10.1080/00963402.2019.1556003.

201 Services (2022) | Fluor. Available at: <https://www.fluor.com/services>.

202 'Forward Focused: 2021 Annual Report', *Fluor (2022)*, p. 33. Available at: https://s201.q4cdn.com/930516572/files/doc_financials/2021/ar/2021-Fluor-Annual-Report.pdf.

203 *Our Parent Companies (2010)* | SRNS. Available at: <https://www.savannahrivernuclearsolutions.com/about/parent.htm>.

204 Amy F. Woolf and James D. Werner (2021) 'The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites', *Congressional Research Service*, p. 19. Available at: <https://crsreports.congress.gov/product/pdf/R/R45306>.

205 *Savannah River Nuclear Solutions, LLC Contract (no date)* Energy.gov. Available at: <https://www.energy.gov/srs/articles/savannah-river-nuclear-solutions-llc-contract> (Accessed: 28 September 2022).

206 *CONTRACT to SAVANNAH RIVER NUCLEAR SOLUTIONS, LLC.* | USAspending, 10 January 2008. Available at: https://www.usaspending.gov/award/CONT_AWD_DEAC0908SR22470_8900_-NONE_-NONE- (Accessed: 28 September 2022).

207 *U.S. Department of Energy Extends Fluor-led Savannah River Site Management and Operating Contract through September 2027.* FLUOR Newsroom, 29 September 2022. Available at: <https://newsroom.fluor.com/news-releases/news-details/2022/U.S.-Department-of-Energy-Extends-Fluor-led-Savannah-River-Site-Management-and-Operating-Contract-through-September-2027/default.aspx>.

208 *Amentum Team Awarded \$28 Billion Y-12 National Security Complex and Pantex Plant Management Contract.* Amentum Press Release, 30 November 2021. Available at: <https://www.amentum.com/amentum-team-awarded-28-billion-y-12-national-security-complex-and-pantex-plant-management-contract/>; *NNSA Awards Management and Operations Contract for Y-12, Pantex.* Energy.gov, 29 November 2021. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-management-and-operations-contract-y-12-pantex>.

209 *NNSA cancels Y-12, Pantex contract award, to hold new competitions for separate site management contracts.* Energy.gov., 16 May 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-cancels-y-12-pantex-contract-award-hold-new-competitions-separate-site>.

210 *Innovation Spanning Every Sector (2022)* | General Dynamics. Available at: <https://www.gd.com/>.

211 'Annual Report 2021', *General Dynamics (2022)*, p.4. Available at: https://s22.q4cdn.com/891946778/files/doc_financials/2021/ar/GD_2021-AR_Final_Bookmarked.pdf.

212 *Strategic Weapon Deterrence (2022)* | General Dynamics Mission Systems. Available at: <https://gdmissionsystems.com/command-and-control/strategic-weapon-deterrence>.

213 *Contracts for October 14, 2022 (2022)* U.S. Department of Defense.

Available at: <https://www.defense.gov/News/Contracts/Contract/Article/3189269/> (Accessed: 18 October 2022).

214 *Contracts for August 22, 2019 (2019)* U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1941859/> (Accessed: 29 September 2022).

215 *Contracts for December 16, 2019 (2019)* U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2041268/> (Accessed: 29 September 2022);

CONTRACT to GENERAL DYNAMICS MISSION SYSTEMS, INC. | USAspending, 1 October 2019. Available at: https://usaspending.gov/award/CONT_AWD_N0003020C0005_9700_-NONE_-NONE- (Accessed: 13 October 2022).

216 *Contracts for July 14, 2022 (2022)* U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/3093802/> (Accessed: 17 October 2022);

General Dynamics Mission Systems Awarded \$272.9 Million Contract for U.S. and U.K. Submarine Fire Control Systems. General Dynamics Mission Systems, 20 July 2022. Available at: <https://gdmissionsystems.com/articles/2022/07/20/news-release-general-dynamics-awarded-contract-for-columbia-submarine-fire-control-systems>.

217 Ibid.

218 Mehta, Aaron; Northrop teams with Lockheed on ICBM replacement. Here's who else is involved', *Defense News*, 16 September 2019. Available at: <https://www.defensenews.com/digital-show-dailies/afa-air-space/2019/09/16/northrop-teams-with-lockheed-on-icbm-replacement-heres-who-else-is-involved/>.

219 *What we do (2022)* | Honeywell. Available at: <https://www.honeywell.com/en/company/about-us>.

220 '2021 Annual Report. The Future is what we make it', *Honeywell (2022)*, p. 14. Available at: <https://investor.honeywell.com/static-files/247b9bee-dbcc-4bf6-ac94-2909a64b4049>.

221 Mehta, Aaron; Northrop teams with Lockheed on ICBM replacement. Here's who else is involved', *Defense News*, 16 September 2019. Available at: <https://www.defensenews.com/digital-show-dailies/afa-air-space/2019/09/16/northrop-teams-with-lockheed-on-icbm-replacement-heres-who-else-is-involved/>; 'Our Sentinel (GBSD) nationwide team will involve over 10,000 people across the United States directly working on this vital national security program', *Northrop Grumman (2020)*. Available at: [Northrop Grumman GBSD Nationwide Team](https://www.northropgrumman.com/our-sentinel-nationwide-team).

222 *CONTRACT to HONEYWELL INTERNATIONAL INC.* | USAspending, 14 May 2018. Available at: <https://www.usaspending.gov/award/>

CONT_AWD_FA821418C0001_9700_-NONE_-NONE- Accessed: 17 October 2022).

223 *CONTRACT to HONEYWELL INTERNATIONAL INC.* | USAspending, 21 March 2022. Available at: https://www.usaspending.gov/award/CONT_AWD_FA821422C0002_9700_-NONE_-NONE- Accessed: 17 October 2022). (Accessed: 17 October 2022).

224 *FEDERAL SOLUTIONS - PERFORMANCE YOU CAN TRUST (2022)* | Honeywell Aerospace. Available at: [Federal Solutions \(honeywell.com\)](https://www.federal-solutions.com/).

225 Ibid.

226 *Nuclear Security Mission (2021)* | Kansas City National Security Campus. Available at: <https://kcncs.doe.gov/missions/nuclear-security-mission>.

227 *Kansas City National Security Campus contract (2017)* Energy.gov. Available at: <https://www.energy.gov/nnsa/kansas-city-national-security-campus-contract> (Accessed: 4 October 2022).

228 'W88 Alteration 370 Program' (2022). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/default/files/2022-01/W88-ALT370%20012422.pdf>.

229 *CONTRACT to HONEYWELL INTERNATIONAL INC.* | USAspending, 9 July 2015. Available at: [CONTRACT to HONEYWELL INTERNATIONAL INC. | USAspending](https://www.usaspending.gov/award/CONT_AWD_FA821418C0001_9700_-NONE_-NONE-) (Accessed: 4 October 2022).

230 'W88 Alteration 370 Program' (2022). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/default/files/2022-01/W88-ALT370%20012422.pdf>.

231 'W76-1 Life Extension Program' (2019). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/prod/files/2019/02/f59/02-13-2019-Factsheet-W76-1%20LEP.pdf>.

232 'W80-4 Life Extension Program' (2022). *National Nuclear Security Administration*. Available at: <https://www.energy.gov/nnsa/articles/w80-4-life-extension-program-lep-fact-sheet>.

233 'B61-12 Life Extension Program' (2021), *National Nuclear Security Administration*. Available at: <https://www.energy.gov/sites/default/files/2021-12/B61-12%20Fact%20Sheet%20December%202021.pdf>.

234 *CONTRACT to NATIONAL TECHNOLOGY & ENGINEERING SOLUTIONS OF SANDIA, LLC* | USAspending, 18 January 2017. Available at: [CONTRACT to | USAspending](https://www.usaspending.gov/award/) (Accessed: 4 October 2022);

About Sandia (2022) | Sandia National Laboratories. Available at: [About Sandia – Sandia National Laboratories](https://www.sandia.gov/).

235 *Universities Research Association, Inc., (URA)*, is a consortium of over 90 leading research-oriented universities, primarily in the United States, and in Canada, Italy, Japan, and the United Kingdom. More information found here: <https://www.ura-hq.org/>

236 *NNSA Awards Sandia National Laboratories Management & Operating Contract to National Technology and Engineering Solutions of Sandia (NTESS).* Energy.gov. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-sandia-national-laboratories-management-operating>.

237 *Our Parent Companies (2010)* | SRNS. Available at: <https://www.savannahrivernuclearsolutions.com/about/parent.htm>.

238 Amy F. Woolf and James D. Werner (2021) 'The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites', *Congressional Research Service*, pp. 19-35. Available at: <https://crsreports.congress.gov/product/pdf/R/R45306>

239 *U.S. Department of Energy Extends Fluor-led Savannah River Site Management and Operating Contract through September 2027.* FLUOR News Release, 29 September 2022. Available at: <https://newsroom.fluor.com/news-releases/news-details/2022/U.S.-Department-of-Energy-Extends-Fluor-led-Savannah-River-Site-Management-and-Operating-Contract-through-September-2027/default.aspx>.

240 'FY 2022 - DOE/NNSA Strategic Performance Evaluation and Measurement Plan (PEMP)', *Energy.gov (2021)*, p. 6. Available at: [FY22 NTESS PEMP Final.pdf \(energy.gov\)](https://www.energy.gov/nnsa/articles/fy22-ntess-PEMP-Final.pdf).

241 Ibid.

242 *CONTRACT to MISSION SUPPORT AND TEST SERVICES LLC* | USAspending, 1 August 2017. Available at: [CONTRACT to MISSION SUPPORT AND TEST SERVICES LLC | USAspending](https://www.usaspending.gov/award/) (Accessed: 4 October 2022).

243 *Who We Are (2022)* | Huntington Ingalls Industries. Available at: <https://www.huntingtoningalls.com/who-we-are/>.

244 'Delivering to an all-domain force. 2021 Annual report', *Huntington Ingalls Industries (2022)*, p. 39. Available at: https://s29.q4cdn.com/772422961/files/doc_financials/2021/ar/HII_2021_AnnualReport_Final_AsPrinted_031522.pdf.

245 'Fiscal Year 2021 Stockpile Stewardship and Management Plan', *National Nuclear Security Administration (2020)*, pp. E-17-E26. Available at: https://www.energy.gov/sites/default/files/2020/12/f82/FY2021_SSMP.pdf.

246 The joint venture includes two integrated subcontractors: Huntington Ingalls Industries and Fluor, and three small business subcontractors: Longenecker & Associates, Merrick-SMSI and TechSource. See *About Us (no*

com/defence-news/news-detail/us-navy-accelerates-tacamo-nuclear-communications-recap-plan .

287 Trident II D5 Fleet Ballistic Missile (2022) | Lockheed Martin. Available at: <https://www.lockheedmartin.com/en-us/products/trident-ii-d5-fleet-ballistic-missile.html>.

288 CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 14 July 2016. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003016C0100_9700_-NONE_-NONE- (Accessed: 5 October 2022); Contracts for January 31, 2020 (2020) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2071889/> (Accessed: 5 October 2022); CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 31 January 2020. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003020C0101_9700_-NONE_-NONE- (Accessed: 5 October 2022); CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 30 August 2019. Available at: https://www.usaspending.gov/award/CONT_AWD_N0003019C0100_9700_-NONE_-NONE- (Accessed: 5 October 2022); CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 7 August 2020. Available at: https://usaspending.gov/award/CONT_AWD_N0003020C0100_9700_-NONE_-NONE- (Accessed: 5 October 2022);

CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 8 August 2018. Available at: [CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending](#) (Accessed: 6 October 2022);

CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 31 July 2020. Available at: https://www.usaspending.gov/award/CONT_AWD_S3309A20F0001_9700_N0003019G0053_9700 (Accessed: 6 October 2022);

CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 10 August 2021. Available at: [CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending](#) (Accessed: 6 October 2022).

CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 1 March 2021. Available at: [CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending](#) (Accessed: 6 October 2022);

CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending, 16 June 2021. Available at: [CONTRACT to LOCKHEED MARTIN CORPORATION | USAspending](#) (Accessed: 6 October 2022);

Contracts for August 18, 2022 (2022) U.S. Department of Defense. Available at: [> U.S. Department of Defense > Contract](#) (Accessed: 5 October 2022).

289 Contracts for April 1, 2019 (2019) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1802502/> (Accessed: 6 October 2022).

290 Definitive Contract N0003018C0023 - GovTribe (2021) GovTribe. Available at: <https://govtribe.com/award/federal-contract-award/definitive-contract-n0003018c0023> (Accessed: 6 October 2022);

FY19 United Kingdom (UK) Technical Support Contract (TSC) - GovTribe, Award Notice Solicitation # N0003018R0023. Available at: <https://govtribe.com/opportunity/federal-contract-opportunity/fy19-united-kingdom-uk-technical-support-contract-tsc-n0003018r0023> (Accessed: 17 October 2022).

291 Who We Are (2022) | Northrop Grumman. Available at: <https://www.northropgrumman.com/who-we-are> .

292 '2021 Annual Report', Northrop Grumman (2022), p. 53 Available at: <https://www.northropgrumman.com/wp-content/uploads/2021-Annual-Report-Northrop-Grumman-1.pdf> .

293 Northrop Grumman Completes Orbital ATK Acquisition, Blake Larson Elected to Lead New Innovation Systems Sector. Northrop Grumman Newsroom, 6 June 2018. Available at: <https://news.northropgrumman.com/news/releases/northrop-grumman-completes-orbital-atk-acquisition-blake-larson-elected-to-lead-new-innovation-systems-sector>.

294 'Veritas Capital Completes Acquisition of Northrop Grumman's IT and Mission Support Services Business', Business Wire, 1 February 2021. Available at: <https://www.businesswire.com/news/home/20210201005535/en/Veritas-Capital-Completes-Acquisition-of-Northrop-Grumman%E2%80%99s-IT-and-Mission-Support-Services-Business>.

295 CONTRACT to PERATON INC. | USAspending, 5 April 2021. Available at: https://www.usaspending.gov/award/CONT_AWD_FA873021F8503_9700_47Q_TCK18D0011_4732 (Accessed: 6 October 2022).

296 CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending, 8 September 2020. Available at: [CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending](#) (Accessed: 6 October 2022).

297 About (2022) | Consolidated Nuclear Security, LLC. Available at: <https://cns-llc.us/about>; Amy F. Woolf and James D. Werner (2021) 'The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites', Congressional Research Service, p. 14. Available at: <https://crsreports.congress.gov/product/pdf/R/R45306>.

298 Contract No. DE-NA0001942 (2018) Energy.gov. Available at: <https://www.energy.gov/nnsa/downloads/contract-no-de-na0001942> (Accessed: 6 October 2022).

299 NNSA Awards Management and Operations Contract for Y-12, Pantex. Energy.gov, 29 November 2021. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-management-and-operations-contract-y-12-pantex> .

300 NNSA cancels Y-12, Pantex contract award, to hold new competitions for separate site management contracts. Energy.gov, 16 May 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-cancels-y-12-pantex-contract-award-hold-new-competitions-separate-site> .

301 NNSA announces contract extension to Consolidated Nuclear Security for the management and operation of the Y-12 National Security Complex and the Pantex Plant. Energy.gov, 3 October 2022. Available at: <https://www.energy.gov/nnsa/articles/nnsa-announces-contract-extension-consolidated-nuclear-security-management-and> .

302 Contracts for November 8, 2019 (2019) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2012852/> (Accessed: 6 October 2022); CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending, 1 August 2016. Available at: [CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending](#) (Accessed: 6 October 2022).

303 Insinna, Valeria, 'The US nuclear forces' Dr. Strangelove-era messaging system finally got rid of its floppy disks', C4ISRNet, 17 October 2019. Available at: <https://www.c4isrnet.com/air/2019/10/17/the-us-nuclear-forces-dr-strangelove-era-messaging-system-finally-got-rid-of-its-floppy-disks/> .

304 CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending, 19 October 1999. Available at: [CONTRACT to NORTHROP GRUMMAN SPACE AND MISSION SYSTEMS CORPORATION | USAspending](#) (Accessed: 6 October 2022).

305 Propulsion Systems (2022) | Northrop Grumman. Available at: <https://www.northropgrumman.com/space/propulsion-systems> .

306 IDV to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending.

Available at: https://usaspending.gov/award/CONT_IDV_FA821421D0001_9700 (Accessed: 6 October 2022);

Contracts for April 20, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2579547/> (Accessed: 6 October 2022);

IDV to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending. Available at: https://www.usaspending.gov/award/CONT_IDV_FA821421D0002_9700 (Accessed: 6 October 2022);

Contracts for July 7, 2021 (2021) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2684977/> (Accessed: 6 October 2022).

307 Contracts for September 6, 2018 (2018) U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1622674/> (Accessed: 6 October 2022);

[CONTRACT to ATK LAUNCH SYSTEMS INC. | USAspending, 6 September 2018. Available at: https://www.usaspending.gov/award/CONT_IDV_FA881818D0001_9700](#) (Accessed: 18 October 2022).

308 'W88 Alteration 370 Program' (2022). National Nuclear Security Administration. Available at: <https://www.energy.gov/sites/default/files/2022-01/W88-ALT370%20012422.pdf>.

309 'W76-1 Life Extension Program' (2019), National Nuclear Security Administration. Available at: <https://www.energy.gov/sites/prod/files/2019/02/f59/02-13-2019-Factsheet-W76-1%20LEP.pdf>.

310 'W80-4 Life Extension Program' (2022). National Nuclear Security Administration. Available at: <https://www.energy.gov/sites/default/files/2022-02/W80-4%20020122.pdf>.

311 'B61-12 Life Extension Program' (2021). National Nuclear Security Administration. Available at: <https://www.energy.gov/sites/default/files/2021-12/B61-12%20Fact%20Sheet%20December%202021.pdf>.

312 CONTRACT to NATIONAL TECHNOLOGY & ENGINEERING SOLUTIONS OF SANDIA, LLC. | USAspending, 18 January 2017. Available at: [CONTRACT to NATIONAL TECHNOLOGY & ENGINEERING SOLUTIONS OF SANDIA, LLC | USAspending](#) (Accessed: 6 October 2022).

313 Universities Research Association, Inc., (URA), is a consortium of over 90 leading research-oriented universities, primarily in the United States, and in Canada, Italy, Japan, and the United Kingdom. More information found here: <https://www.ura-hq.org/>.

314 NNSA Awards Sandia National Laboratories Management & Operating Contract to National Technology and Engineering Solutions of Sandia (NTES). Energy.gov, 2016. Available at: <https://www.energy.gov/nnsa/articles/nnsa-awards-sandia-national-laboratories-management-operating> (Accessed: 6 October 2022).

315 Propulsion Systems (2022) | Northrop Grumman. Available at: <https://www.northropgrumman.com/space/propulsion-systems> .

316 CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending, 1 October 2015. Available at: [CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending](#) (Accessed: 6 October 2022).

317 CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending', 1 October 2020. Available at: [CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending](#) (Accessed: 7 October 2022);

Contracts for October 1, 2020 (2020) U.S. Department of Defense. Available at: [> U.S. Department of Defense > Contract](#) (Accessed: 7 October 2022).

318 CONTRACT NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending, 12 March 2019. Available at: [CONTRACT to NORTHROP GRUMMAN SYSTEMS CORPORATION | USAspending](#) (Accessed: 6 October 2022).

319 *What we do (2022)* | Raytheon Technologies. Available at: <https://www.rtx.com/our-company/what-we-do>.

320 'Advancing the edge of innovation for a safer, more connected world. 2021 Annual Report', *Raytheon Technologies (2022)*, p. 35. Available at: <https://investors.rtx.com/static-files/d6a4fbd3-d8df-40dd-b278-019fb954dfc0>.

321 *United Technologies and Raytheon Complete Merger of Equals Transaction*. *Raytheon Technologies*, 3 April 2020. Available at: <https://www.rtx.com/news/2020/04/03/united-technologies-and-raytheon-complete-merger-of-equals-transaction>.

322 *Contracts for July 1, 2021 (2021)* U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/2680485/> (Accessed: 7 October 2022).

323 Napoli, Jessica, *Collins Aerospace to deliver launch platform for ICBM modernization program*. *Collins Aerospace*, 9 November 2020. Available at: <https://www.collinsaerospace.com/newsroom/News/2020/11/Collins-deliver-launch-platform-ICBM-modernization-program>.

324 CONTRACT to RAYTHEON COMPANY | USAspending, 27 September 2013. Available at: https://www.usaspending.gov/award/CONT_AWD_FA820413C0009_9700_-NONE_-NONE- (Accessed: 18 October 2022).

325 *Contracts for September 22 2022, 2022 (2022)* U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/3168041/> (Accessed: 18 October 2022).

326 *About (2022)* | Rostec. Available at: <https://rostec.ru/en/about/> (Accessed: 11 August 2022).

327 'Science. Overcoming Technologic Barriers. Annual Report, Rostec State Corporation 2019' *Rostec (2020)*, pp. 12-13. Available at: <https://rostec.ru/upload/iblock/baf/baf448d95ffa8611fad46e0df57032df.pdf>.

328 *U.S. Treasury Sanctions Nearly 100 Targets in Putin's War Machine, Prohibits Russian Gold Imports* (press release). U.S. Department of the Treasury, 28 June 2022. Available at: <https://home.treasury.gov/news/press-releases/jy0838>.

329 'Science. Overcoming Technologic Barriers. Annual Report, Rostec State Corporation 2019' *Rostec (2020)*, pp. 152 and 187. Available at: <https://rostec.ru/upload/iblock/baf/baf448d95ffa8611fad46e0df57032df.pdf>.

330 *Safran at a glance (no date)* | Safran. Available at: <https://www.safran-group.com/group/profile> (Accessed: 10 August 2022).

331 *Company profile (no date)* | ArianeGroup. Available at: <https://www.ariane.group/en/about-us/company-profil/> (Accessed: 10 August 2022).

332 'FY 2021 RESULTS', *Safran (2022)*, p. 14 Available at: <https://www.safran-group.com/media/394756/download>.

333 *M51: A CENTRAL PART OF FRENCH DETERRENCE (no date)* | ArianeGroup. Available at: <https://www.ariane.group/en/defense/m51/> (Accessed: 10 October 2022).

334 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, pp. 26-27. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

335 Roxel is the European leader in tactical propulsion systems and a major player in world markets (2022) | Roxel. Available at: <https://www.roxelgroup.com/en/corporate/>; *Roxel (2022)* | MBDA. Available at: <https://www.mbda-systems.com/polska/about-us/mbda-worldwide/roxel-2/>.

336 Market segments: propulsion systems (2022) | Roxel. Available at: <https://www.roxelgroup.com/en/market-segments/>.

337 *Company (2022)* | Textron. Available at: <https://www.textron.com/About/Company>.

338 Textron's powerful brands (2022) | Textron. Available at: <https://www.textron.com/>.

339 'Textron 2021 Annual report', *Textron (2022)*, p. 1. Available at: https://s1.q4cdn.com/535492436/files/doc_financials/2021/ar/Textron_Annual_Report_2021.pdf.

340 *Contracts for July 12 2019, 2022 (2019)* U.S. Department of Defense. Available at: <https://www.defense.gov/News/Contracts/Contract/Article/1903937/> (Accessed: 18 October 2022); CONTRACT to TEXTRON SYSTEMS CORPORATION | USAspending, 27 September 2013. Available at: https://www.usaspending.gov/award/CONT_AWD_FA820414C0011_9700_-NONE_-NONE- (Accessed: 18 October 2022).

341 CONTRACT to TEXTRON SYSTEMS CORPORATION | USAspending, 6 March 2014. Available at: https://www.usaspending.gov/award/CONT_IDV_FA820414D0001_9700 (Accessed: 10 October 2022).

342 Mehta, Aaron, 'Northrop teams with Lockheed on ICBM replacement. Here's who else is involved', *Defense News*, 16 September 2019. Available at: <https://www.defensenews.com/digital-show-dailies/afa-air-space/2019/09/16/northrop-teams-with-lockheed-on-icbm-replacement-heres-who-else-is-involved/>

343 *About Thales (2022)* | Thales Group. Available at: <https://www.thalesgroup.com/en/global/group>.

344 Ibid. (Accessed: 11 August 2022).

345 'Integrated Report. Corporate Responsibility 2021-2022', *Thales (2022)*, p. 48. Available at: https://www.thalesgroup.com/sites/default/files/database/document/2022-06/Thales_IntegratedReport_0.pdf.

346 *Governance (2020)* | Naval Group. Available at: <https://www.naval-group.com/en/governance-26>.

347 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 29. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

348 ASMPA (2022) | MBDA Missile Systems. Available at: <https://www.mbda-systems.com/product/asmpa/>.

349 'Budget Général. Programme 146. Projets Annuels de Performances. Annexe au Projet de Loi de Finances pour 2023: Équipement Des Forces' (2023), *RÉPUBLIQUE FRANÇAISE*, p. 28. Available at: <https://www.budget.gouv.fr/index.php/documentation/documents-budgetaires/exercice-2023/projet-de-loi-de-finances/budget-general/defense>.

350 *Overview (no date)* | Walchandnagar Industries. Available at: <https://walchand.com/about-us/company-profile/overview/> (Accessed: 11 August 2022).

351 'Financial Result 31.03.2022', *Walchandnagar Industries (2022)*. Available at: <https://walchand.com/wp-content/uploads/2022/06/Financial-Result-31.03.2022.pdf> (Accessed: 11 August 2022).

352 'DEFENSE, AEROSPACE, MISSILES', *WALCHANDNAGAR INDUSTRIES LIMITED (2015)*. Available at: <https://walchand.com/download.php?flp=https://walchand.com/wp-content/uploads/2015/07/WIL-Brochure-Defence-Aerospace-Missile-Reduced.pdf>.

353 *Defence (no date)* | Walchandnagar Industries. Available at: <https://walchand.com/business-area/defence-missile/> (Accessed: 10 October 2022).

354 Gartside, Ben, 'Ethical investors block bid for nuclear weapons contracts', *The Telegraph*, 6 November 2021. Available at: [Ethical investors block bid for nuclear weapons contracts \(telegraph.co.uk\)](https://www.telegraph.co.uk/news/ethical-investors-block-bid-for-nuclear-weapons-contracts).



**DON'T BANK
ON THE BOMB**