



EUROPEAN
LEADERSHIP
NETWORK

Guarding the unthinkable:

Why regular fail-safe reviews are essential for responsible nuclear stewardship

Policy brief

Julia Berghofer

October 2025

The European Leadership Network (ELN) is an independent, non-partisan, pan-European network of over 450 past, present and future European leaders working to provide practical real-world solutions to political and security challenges.

The Nuclear Threat Initiative (NTI), Euro-Atlantic Security Leadership Group (EASLG), Asia-Pacific Leadership Network (APLN), and European Leadership Network (ELN) have worked since March 2020 to highlight the benefits of independent, internal “fail-safe” reviews in nuclear-armed states. This policy brief is part of the ELN’s project on nuclear fail-safe. The ELN’s fail-safe work was made possible by a grant from the Peter G. Peterson Foundation.

About the Author



Julia Berghofer
*ELN Senior Policy
Fellow and YGLN Project
Manager*

Julia Berghofer is an ELN Senior Policy Fellow and Project Manager for the Younger Generation Leaders Network on Euro-Atlantic Security (YGLN). Prior to joining the ELN, Julia worked with the German Institute for International and Security Affairs (SWP) in Berlin, and with the Munich Security Conference (MSC).

Julia holds a Bachelor in Political and Communication Sciences from the Ludwig-Maximilians-University in Munich and the University of Vienna, and completed her Master in Political Science at the University of Hamburg.

She is a member of the YGLN and the Euro-Atlantic Security Leadership Group (EASLG), as well as the Heinrich Böll Foundation’s Forum Neue Sicherheitspolitik. She is an alumni of the Réseau Nucléaire et Stratégie – Nouvelle Génération (RNS-NG, promo 2017/18).

Julia’s first book as a solo author (“Der Neue Kalte Krieg”, Quadriga Verlag) was published in 2023. She also co-edited “The Implications of Emerging Technologies in the Euro-Atlantic Space: Views from the Younger Generation Leaders Network” together with YGLN colleagues (Palgrave, 2023).

Julia’s research areas include nuclear arms control and risk reduction in the Euro-Atlantic region.

Executive summary

- In times of eroding arms control measures, nuclear-weapon states should consider enhancing transparency around their nuclear safety, security and reliability mechanisms (“fail-safe”) to strengthen the risk reduction agenda.
- The P3, claiming the status as responsible nuclear-weapon states have a particular responsibility to drive forward the agenda.
- This can be done on different levels and in different formats.
- **France**, as a good example of strong safety and security governance, could provide more transparency around these measures in the Non-Proliferation Treaty (NPT) context and it could engage on the issue in the P5 format.
- The **UK** could provide more information to their public and Parliament, as part of the ‘National Endeavour’ communications campaign. It could likewise address the issue in the NPT context and place it on the P5 agenda.
- The **P3** could collectively address the issue in an NPT working paper, and provide insights to NATO allies.
- Finally, **non-nuclear weapon states** could support the endeavour by making fail-safe a regular topic of discussion in the NPT.

In times of eroding arms control measures, nuclear-weapon states should consider enhancing transparency around their nuclear safety, security and reliability mechanisms (“fail-safe”) to strengthen the risk reduction agenda.

1. Introduction

In times of eroding arms control and confidence-building measures, increased transparency around nuclear-armed states' fail-safe mechanisms and reviews would be an essential risk reduction measure. Individual nuclear weapons possessors could enhance transparency without revealing national secrets. France is a good example of how safety, security and reliability measures can be addressed publicly in an unclassified manner. At the same time, exchanges on best practices could take place in multilateral formats such as the P5, in the Non-Proliferation Treaty (NPT) and in a NATO context.

The P3 decided to take a lead on responsible behaviour¹ in the NPT context. As there is persistent uncertainty over the US's willingness to engage in risk reduction, there is even more reason for France and the UK to lead by example on an important issue that can significantly enhance the global risk reduction agenda. It can likewise contribute to the next NPT Review Conference (RevCon) without affecting deterrence language and capabilities.

There is no certainty over whether increased P2/P3 transparency around nuclear safety, security, and reliability would be reciprocated by Russia and China or even states outside the NPT. Likewise, no guarantee can be given on whether the majority of non-nuclear weapons states would be willing to support fail-safe as a new agenda item on an NPT risk reduction agenda. Therefore, NATO allies and other non-nuclear-weapon states supporting risk reduction can play a crucial role in shaping the agenda and engaging with states that are critical to ensure risk reduction and disarmament are not seen as either/or but complementary.

2. Fail-safe as a risk reduction measure

Fail-safe measures need to take account of a changing threat landscape. They become increasingly important as emerging technologies evolve at rapid pace and are continuously more integrated into NC3.

The concept of “failing safely”

Fail-safe refers to the implementation of crucial safeguards aimed at preventing the unauthorised, accidental or mistaken use of a nuclear weapon. Its purpose is to ensure that in case of the failure of one or more components of nuclear weapons and associated nuclear command, control and communications (NC3) system, it fails without resulting in catastrophic consequences. Initially a technical term used in engineering, fail-safe describes structures that states can implement to protect sensitive systems and to ensure they work as envisaged. The term’s usage extended to the domain of nuclear weapons, and one of the first known references to the concept in nuclear operations dates back to 1958, when a memorandum from the USAF Chief of Staff mentioned fail-safe measures in relation to the US Air Force operational planning.²

The memorandum describes the establishment of the fail-safe concept with the Air Force and its original meaning. In the words of the USAF Chief of Staff, “the Air Force has developed a ‘Fail Safe’ concept designed to establish a capability to launch the alert force with positive assurance that it would not continue to the target unless specifically instructed to do so... This concept insures the entire force will, as the name depicts, FAIL SAFE if authority is not received to continue to the target”.

This is only one possible example of how fail-safe can provide an extra level of assurance against inadvertent use of nuclear weapons, often framed as “negative control”³. More generally, effective fail-safe measures can address any possible threat to, or weakness of, the NC3 system, related infrastructure and personnel tasked with the nuclear mission.

Fail-safe measures need to take account of a changing threat landscape. They become increasingly important as emerging technologies evolve at rapid pace and are continuously more integrated into NC3. The growing entanglement of nuclear weapons systems and new technologies such as cyber, artificial intelligence (AI) and quantum computing is a case in point.

It is reasonable to assume that the majority of states possessing nuclear weapons – if not all – have implemented fail-safe measures. However, there is a paucity of publicly available information regarding the specifics of these measures and the extent to which they are regularly updated to take account of emerging threats.

Even if a nuclear-armed state has reliable and robust fail-safe measures in place, these must be regularly reviewed and updated. This is important to ensure that nuclear weapons possessors stay ahead of the curve and address new, emerging vulnerabilities. Otherwise, existing fail-safe mechanisms risk becoming unreliable and, as a consequence, obsolete.

The practice of reviewing fail-safe mechanisms

The *principle* of fail-safe must therefore be differentiated from the practice of *reviewing* these mechanisms. Fail-safe reviews are set to ensure that the measures in place are continuously adapted to new threat environments.

Among the nine nuclear weapon possessors, only the United States are known to have done two comprehensive reviews of their fail-safe mechanisms. The first Failsafe and Risk Reduction Review (FARR)⁴ was conducted 1990-92 by an independent commission, the Federal Advisory Committee on Nuclear Failsafe and Risk Reduction. Its task was “to assess the capability of the nuclear weapon command and control system to meet the dual requirements of assurance against unauthorised use of nuclear weapons and assurance of timely, reliable execution when authorised, and to identify opportunities for positive measures to enhance failsafe features”.⁵ While public references to the FARR are scarce, there is evidence that the recommendations resulted in at least one concrete fail-safe step: In the late 1990s, the US Navy added coded control devices to sea-launched Trident missiles, deployed on US ballistic missile submarines (SSBNs).

The second review was conducted under the Biden Administration in 2022. Section 1644 of the National Defence Authorization Act (NDAA) 2022 states that in the past three decades, “new threats to the nuclear enterprise have arisen in the cyber, space, and information warfare domains,” making a new review necessary.

It is noteworthy that the US legislative branch mandated both reviews. Congress was briefed in a classified setting on the results of the FARR in the 1990s. Both reviews were also conducted by semi-independent third parties who had access to classified information but were not part of the nuclear enterprise. In this way, Congress wanted to improve accountability and ensure impartiality of the process.

The Biden review was completed shortly before the Trump Administration took office. The new Administration has so far made no public statement about the conduct of the review or given any insights into the planned implementation of its findings. It can be assumed that Congress has not yet been briefed on the results of the second fail-safe review.

While the US is the only nuclear-armed state using the term ‘fail-safe’ systematically, we can assume that France and the UK also have strong fail-safe measures. As regards France, these mechanisms are laid out in the form of the *Côntrole gouvernemental* (CG), a specific section in the *Code de la défense* (Defence Code). In contrast, no unified document in the UK refers to safety and security measures.

While the existing measures and mechanisms are considered reliable and robust, the UK and France could take several steps to strengthen the visibility of their safeguards to enhance the global risk reduction agenda.

3. How France and the United Kingdom could advance fail-safe

France's *Contrôle gouvernemental de la dissuasion nucléaire* is a good example of how a nuclear-weapon state can provide crucial information on its safety and security mechanisms pertaining to NC3 and related nuclear infrastructure without compromising any national secrets.

Amongst these steps are actions that both countries could take individually, as well as bilaterally. Progress could be made in the P3 and P5 context. Likewise, non-nuclear weapon states parties to the NPT and members of NATO could support the UK and France in various ways to enhance fail-safe on the global risk reduction agenda.

At a time when spending on nuclear weapons is set to increase, it would be particularly useful to enhance transparency around how London and Paris ensure their nuclear weapons are fail-safe. Domestically, both would strengthen the legitimacy of their nuclear postures by demonstrating accountability to legislatures. Subjecting nuclear weapons complexes to political oversight would undoubtedly lead to more stringent implementation of safety and security measures. Among nuclear-weapon states, specifically in the P5, France and the UK could set an example of responsible behaviour. They could also pave the way for meaningful exchanges around best practices for nuclear safety and security. Multilaterally, within NATO and the NPT, the two European nuclear powers could demonstrate 'responsible behaviour'. At a time of nuclear tensions and irresponsible leaders controlling nuclear arsenals, non-nuclear weapons states should encourage such steps to reduce nuclear risks, while emphasising that these steps are not a substitute for nuclear disarmament.

3.1 France

France's *Contrôle gouvernemental de la dissuasion nucléaire* (CG)⁶ is a good example of how a nuclear-weapon state can provide crucial information on its safety and security mechanisms pertaining to NC3 and related nuclear infrastructure without compromising any national secrets. The CG explains the various responsibilities, including the separation of the security and implementation chain in the French nuclear weapons system. French officials and experts describe the CG as a stand-alone set of mechanisms that are specific to the French arsenal. They argue that this approach is not transferable into other contexts and thus tend to refuse to use the term 'fail-safe'.

France has an established feedback mechanism with Parliament on the CG. This provides political oversight and aligns with "a national culture of deterrence aimed at promoting and maintaining public support and understanding of the deterrence strategy".⁷ Paris emphasises that it wants to conduct a nuclear debate "without taboo".⁸

Domestically, there are additional steps Paris could take to benefit from increasing transparency around the CG by making the safety and security of nuclear weapons a more regular topic in public debates. France can and should present the CG as a robust measure to reduce the risk of nuclear conflict by unintended, accidental or mistaken nuclear use.

Multilaterally, France could draft a working paper for the 2026 NPT RevCon that describes the measures Paris has put in place to prevent accidental nuclear weapons use. Such a paper would align with other French initiatives to demonstrate that it is a responsible guardian of its nuclear weapons.

Such a working paper that presents the CG as one way in which a nuclear-weapon state could publicly speak about crucial safety and security measures could provide an incentive for other nuclear-weapon states to become more transparent as well. Thereby, France could be leading by example.

The working paper would already break new ground by describing the measures outlined in the Defence Code and presenting them in a digestible way so that the benefits of the CG are easily understandable for a wider audience. The document could underpin the argument that French nuclear weapons are safe and secure by describing not only the crucial separation of the security and implementation chain but also the role of the Gendarmerie de la sécurité des armements nucléaires (GSAN). It could explain how the CG is regularly updated in response to emerging threats.⁹ Finally, it could mention the feedback mechanism with Parliament to demonstrate domestic accountability around nuclear weapons safety and security.

3.2 The UK

France and the UK have recently decided “to deepen their nuclear cooperation and coordination.”¹⁰ Yet, while Paris and London are becoming increasingly aligned with regard to nuclear deterrence, French and British nuclear culture continues to be different. This includes the extent to which officials are willing to publicly refer to issues around nuclear weapons safety and security approaches.

However, UK policies to increase reliance on nuclear weapons have also increased the need to be more transparent on nuclear safety and security.

The recent Strategic Defence Review (SDR) introduced the return of an airborne component to the British deterrent. This constitutes a significant update and elevates the role and salience of nuclear weapons in UK defence and security. Alongside massive investments in the modernisation of the SSBN fleet as well as the immense costs related to the development of the new independent warhead for the British Trident missiles, the reintroduction of formerly abandoned air-launched nuclear weapons will require an effort to gather public support over the long term.

The SDR acknowledged this circumstance by announcing a “National Endeavour” public communications campaign that “conveys the fundamental importance and necessity of the deterrent”.¹¹ While no further information on the campaign has been provided yet, more comprehensive information to Parliament, experts, and a general audience is expected to be part of it. In this context, HMG could take several steps related to fail-safe:

First, the government could be more transparent on existing safety, security, and reliability mechanisms pertaining to nuclear weapons and NC3 – especially in the light of emerging threats – to Parliament. To date, nuclear safety and security have only been addressed on one occasion in recent years, following a question by Lord Browne whether the UK government plans to conduct a review similar to the US.¹² There have been no further attempts to discuss the issue in Parliament, which is recognisable in the public sphere.

UK policies to increase reliance on nuclear weapons have also increased the need to be more transparent on nuclear safety and security.

Second, the Ministry of Defence could provide, as appropriate, information on the work of the Strategic Systems Performance Assessment and Analysis Group (SSPAG). This group is surrounded by secrecy, but its purpose appears to be to “monitor, audit, horizon scan and report” on the “vulnerability of the broad range of systems, infrastructure, operations and processes which together constitute the UK’s nuclear deterrent”.¹³ Information on the work of the SSPAG and other bodies tasked with nuclear safety and security¹⁴ to the Ministry of Defence could be made public in a similar way that France describes the work of the GSAN.

Third, such transparency could also be provided in the NPT. As states prepare for the upcoming RevCon in spring 2026, the UK could take a forward-leaning approach and draft a working paper similar to the “Getting to a world without nuclear weapons” food-for-thought paper submitted ahead of the 2022 RevCon¹⁵. Such a paper could address the regular safety and security mechanisms that exist in the UK to guarantee the deterrent remains safe and secure, including against emerging technology-related threats. It could provide information on the role of the bodies overseeing safety and security, as well as reporting mechanisms, to demonstrate that the UK ensures the safeguarding of its nuclear weapons.

The document could serve two functions: it could put flesh to the bones of the National Endeavour campaign that the SDR promised to deliver by explaining to a broader public that the deterrent is at all times safe and secure and available whenever needed. Likewise, it could describe how, in light of modernisation and the introduction of new capabilities to the British deterrent, the integrity and robustness against emerging threats will be guaranteed.

As an additional benefit, this document would support the assurances that the UK provides to other nuclear-weapon states and non-nuclear-weapon states in the NPT that the deterrent is safe and secure against any miscalculation or accidental use.

Submitting a working paper for the RevCon on this issue would also underscore the UK’s efforts to increase overall transparency and feedback mechanisms in the context of the national report to the NPT.

3.3 P2

The Northwood Declaration has brought the UK and France closer on nuclear matters. While Paris and London expressed a willingness to increase coordination on nuclear policy, capabilities and operations, they could also demonstrate greater collaboration on nuclear safety and security.

During the 2025 NPT PrepCom, the UK and France hosted separate side events to launch their draft national reports and to open the space for discussion with other delegations and the expert community. The effort was well received by nuclear weapon states and non-nuclear weapon states alike, demonstrating an interest not just from the side of like-minded states but also from more critical ones. There was a sense in the discussion that both events, although organised independently, were referencing each other. Partly, one reason could have been that amongst the P5, only the

UK and France decided to open the floor to discuss their draft national reports. At the same time, in times of closer collaboration on nuclear matters between London and Paris, this is a logical development.

Against this backdrop – and the uncertainty of the US readiness to engage on nuclear security – the UK and France could demonstrate the safety of their nuclear arsenals. Opting for co-authored working papers on safety, security and reliability of French and UK nuclear weapons systems would complement national efforts to demonstrate efforts around nuclear weapons safekeeping. Reviews around these mechanisms (regardless of whether they are framed as ‘fail-safe’ or something else) could be presented as important and feasible steps to reduce the risk of unintended nuclear conflict at a time when other arms control and confidence-building structures are under pressure or eroding.

The document could also call on other nuclear-weapon states to be more transparent on their respective fail-safe measures and related review mechanisms.

3.4 P3

While unlikely given the political context, a joint working paper by the US, UK, and France on fail-safe as a risk reduction measures would give a strong signal to the NPT community, allies, and non-nuclear-weapon states that are critical of the risk reduction agenda. It would also send a strong signal to China and Russia.

This would also perfectly align with the ambition that the UK, US and France laid out in the working paper for the 2022 NPT RevCon on “Principles and Responsible Practices for Nuclear Weapon States¹⁶: “We seek to foster dialogue among States possessing nuclear weapons, and between States possessing nuclear weapons and Non-Nuclear Weapon States, to increase understanding and reduce the risk of misinterpretation and miscalculation”. Furthermore the working paper refers to “transparency of nuclear policy, doctrine, and budgeting, including public sharing of information, on modernisation plans and nuclear deterrence goals, and encourage other States to do likewise”. While it does not explicitly mention transparency around nuclear safety and security, this would perfectly fit the agenda of responsible nuclear weapon states and should thus be included in a new working paper or an update to the 2022 one.

Furthermore, against the backdrop of growing entanglement of NC3 and new technologies, there should be a high interest among non-nuclear allies in NATO to be informed about how the US, UK and France are increasing the resilience of their nuclear arsenals and how the review processes work. It should be less complicated for the P3 to brief allies on their respective nuclear safety, security and reliability review mechanisms than to address the issue in the NPT context. They would not be exposed to potential criticism from adversaries and NNWS alike; the context is different, and allies might have legitimate questions about the safety and security of the French and British systems in particular, as the salience of deterrence in Europe is growing while at the same time these two states are intensifying their cooperation in the nuclear field. There could be classified briefings amongst allies as well as in the NATO Parliamentary Assembly.

While France's relationship with NATO in the nuclear field is slightly more nuanced than the UK's, addressing the issue with allies would align with the intent laid out in the Strategic Review 2022. It calls for redoubling efforts to strengthen the strategic and deterrence culture at the national level and in the EU and NATO, by enabling a wider audience to take ownership of deterrence issues.¹⁷ Equally, it aligns with the goal of having a strategic dialogue on nuclear issues as laid out in the 2025 strategic review.¹⁸

Such a working paper would be a positive signal for demonstrating alignment on the issue between the P3. It would set fail-safe as a regular topic in multilateral forums. It could also incentivise Russia and China to engage in the topic.

3.5 P5

Although it would be a highly ambitious effort, fail-safe could be addressed in the context of the P5. The UK took over chairmanship of the format in September. The agenda they drive forward could be significantly enhanced if fail-safe was included. As a first step, the UK could aim for a dialogue on the respective terminology. The term 'fail-safe' cannot easily be translated into Chinese¹⁹ or Russian. It does not exactly resonate with a French audience either. The P5 could produce a glossary explaining different understandings of the term and suggesting how it best translates into other languages.

Furthermore, the P5 states could share, as a next step, basic principles of their respective safety and security mechanisms, without revealing national secrets. They could, for example, explain how these mechanisms prevent any interference of EDTs with NC3 that could result in the inadvertent or mistaken use of a nuclear weapon. They could also describe the work of the respective bodies tasked with reviewing safety and security measures.

3.6 Non-nuclear-weapon states in the NPT

Non-nuclear weapon states in the NPT can play an important role in supporting nuclear weapon states' engagement on fail-safe in the run-up and during the RevCon. They could make a case for the P5 to put fail-safe on their respective agendas. Also, they could address fail-safe in their own side events and working papers. The recent working paper by the Stockholm Initiative that included fail-safe as one of the recommendations²⁰ is a good example. It called for the nuclear-weapon states to regularly review their fail-safe mechanisms. It furthermore encourages "[c]onversations between nuclear-weapon States and with non-nuclear-weapon States around national measures to assure the safety and security of nuclear weapons would be a welcome risk reduction measure".²¹

Other cross-cutting initiatives could take up the issue and address it in statements, working papers, or side events. Thereby, they would foster a broader exchange on the issue.

Some non-nuclear weapon states, including those from the Global South, are sceptical when it comes to risk reduction, and there is a well-documented fear that risk reduction could be used as a substitute for disarmament, which is a concern not unfounded. However, even if one subscribes to this interpretation of risk

Non-nuclear weapon states in the NPT can play an important role in supporting nuclear weapon states' engagement on fail-safe in the run-up and during the RevCon.

reduction, nuclear weapon states should be held accountable in terms of explaining how they guarantee their arsenals remain safe and secure, particularly in light of new and emerging threats. Risk reduction and disarmament should not be seen as an either/or pathway but as complementary.

4. Conclusions

Fail-safe is a topic that should be high on the agenda of individual nuclear-weapon states as well as in multilateral formats. In light of new technologies and related threats to NC3 and surrounding infrastructure, fail-safe becomes an even more indispensable principle, the implementation of which needs to be regularly reviewed by nuclear-weapon states.

While individual states already perform well when it comes to fail-safe, more can be done to create an environment where the topic and its relevance for the risk reduction agenda can be addressed in and between nuclear weapon states, as well as with non-nuclear weapon states:

France:

- Domestically increase visibility of the *Contrôle gouvernemental de la dissuasion nucléaire* (CG)
- Draft a working paper for the 2026 RevCo that describes the measures Paris has taken to prevent accidental nuclear weapons use.

UK:

- Become more transparent on existing safety, security, and reliability mechanisms pertaining to nuclear weapons and NC3 to parliament, experts, and the general public. This could be part of the 'National Endeavour' public communications campaign.
- Enhance the visibility of the bodies responsible for safety and security.
- Draft a working paper for the RevCon addressing the regular safety and security mechanisms that exist in the UK to guarantee the deterrent remains safe and secure, including against emerging technology-related threats.

P2:

- Draft a co-authored working paper for the RevCon. The document could also call on other nuclear-weapon states to be more transparent on their respective fail-safe measures and related review mechanisms.

P3:

- Prepare a joint P3 working paper for the RevCon on fail-safe as a risk reduction measure, thus underlining their status as responsible nuclear weapon states.
- Brief allies on their respective nuclear safety, security, and reliability review mechanisms in a NATO context.

The P3 should prepare a joint working paper for the RevCon on fail-safe as a risk reduction measure, thus underlining their status as responsible nuclear weapon states.

P5:

- The UK could include fail-safe discussions on the P5 agenda.
- Conversations on the fundamentals of the concept and terminology could be followed by discussions of the basic principles of their respective safety and security mechanisms without revealing national secrets.

Non-nuclear weapon states:

- Push for the P5 to include fail-safe on their agenda.
- Cross-cutting initiatives could include fail-safe-related recommendations in their respective statements and working papers, similar to the Stockholm Initiative 2025 working paper.
- Contribute to an environment in which the topic becomes a natural agenda item in multilateral forums and between nuclear weapon states.

While the menu presented in this paper is certainly non-exhaustive and includes both realistic as well as highly ambitious options, it can serve as a conversation primer and could be used as an orientation by experts and policy-makers.

References

- 1 See Principles and responsible practices for Nuclear Weapon States: Working paper submitted by France, the United Kingdom of Great Britain and Northern Ireland and the United States of America, 29.07.2022, <https://documents.un.org/doc/undoc/gen/n22/446/53/pdf/n2244653.pdf>.
- 2 United States Office of the Historian, Memorandum From Chief of Staff, USAF, to the JCS, 10.03.1958, <https://history.state.gov/historicaldocuments/frus1958-60v03mSupp/d24#:~:text=2.,materially%20improve%20our%20deterrent%20posture>.
- 3 NTI, Russia and the Dilemmas of Nuclear Disarmement, <https://www.files.ethz.ch/isn/145657/12009a.pdf?>
- 4 Department of Defense, Final Report of the Federal Advisory Committee on Nuclear Failsafe and Risk Reduction (FARR), [https://archive.org/details/FinalReportoftheFederalAdvisoryCommitteeonNuclearFailsafeandRiskReductionFARR/page/n195/mode/2up](https://archive.org/details/FinalReportoftheFederalAdvisoryCommitteeonNuclearFailsafeandRiskReductionFARR/page/n195/mode/2up/FinalReportoftheFederalAdvisoryCommitteeonNuclearFailsafeandRiskReductionFARR/page/n195/mode/2up)
- 5 NDAA 2022, Sec. 1644, <https://www.congress.gov/bill/117th-congress/senate-bill/1605/text>.
- 6 Code de la défense, https://www.legifrance.gouv.fr/codes/section_lc/LEGITEXT000006071307/LEGISCTA000006182875/.
- 7 Assemblée Nationale, Rapport d'information, 2023, <https://www.assemblee-nationale.fr/dyn/opendata/RINFANR5L16B1112.html>.
- 8 Sénat, La nécessaire modernisation de la dissuasion nucléaire, 2017, https://www.senat.fr/rap/r16-560/r16-560_mono.html#toc707
- 9 The last substantial update occurred in 2024 and took account of new threats to vital information security systems pertaining to infrastructure relevant for nuclear deterrence.
- 10 GOV.UK. 'Northwood Declaration: 10 July 2025 (UK-France Joint Nuclear Statement)': 10 July 2025. <https://www.gov.uk/government/news/northwood-declaration-10-july-2025-uk-france-joint-nuclear-statement>.
- 11 Ministry of Defence, Strategic Defence Review 2025, https://assets.publishing.service.gov.uk/media/683d89f181deb72c2e2680a5/The_Strategic_Defence_Review_2025_-_Making_Britain_Safer_-_secure_at_home_strong_abroad.pdf.
- 12 UK Parliament, Nuclear Weapons: Failsafe Review, 06.03.2023, <https://hansard.parliament.uk/Lords/2023-03-06/debates/76A1100E-D8A2-43E7-AF69-951ABE219C67/NuclearWeaponsFailsafeReview>.
- 13 BASIC, "Concerning SSBN Vulnerability - recent papers" by Rear Admiral John Gower, June 10, 2016, <https://basicint.org/blogs/rear-admiral-john-gower-cb-obe/06/2016/concerning-ssbn-vulnerability-recent-papers/#:~:text=Concerning%20SSBN%20Vulnerability%20%2D%20recent%20papers.%20Rear,asserted%20the%20UK's%20strategic%20nuclear%20deterrent%20is>.
- 14 The Safety Review Group one published one report on the safety of nuclear weapons systems in 1992, but there are no other public references pointing to the work of this group, <https://www.nuclearinfo.org/wp-content/uploads/2020/09/Report-on-the-Safety-of-UK-Nuclear-Weapons-Oxburgh-Report.pdf>.
- 15 Principles and Responsible Practices for Nuclear Weapon States: Working Paper Submitted by France, the United Kingdom of Great Britain and Northern Ireland and the United States of America", 29 July 2022, <https://documents.un.org/doc/undoc/gen/n22/446/53/pdf/n2244653.pdf>.
- 16 *Révue nationale stratégique* <https://www.sgdsn.gouv.fr/files/files/Revue%20nationale%20stratégique%20-%20Français.pdf>
- 17 *Revue nationale stratégique 2025*, https://www.sgdsn.gouv.fr/files/2025-08/20250713_NP_SGDSN_Actualisation_2025_RNS_FR.pdf.
- 18 Zhu Junwei, A Preliminary Discussion of
- 19 Chinese Translations of "Nuclear Failsafe", https://europeanleadershipnetwork.org/wp-content/uploads/2025/08/Chinese-Translations-of-Nuclear-Failsafe_r2.pdf.
- 20 Navigating the potential impact of emerging technologies on nuclear disarmament, arms control, non-proliferation and peaceful uses of nuclear energy and technology, 25.05.2025, <https://www.government.se/contentassets/69558f7f0bbc48c0ad2a2c0e70e7ca9a/navigating-the-potential-impact-of-emerging-technologies-on-nuclear-disarmament-arms-control-non-proliferation-and-peaceful-uses-of-nuclear-energy-and-technology.pdf>.
- 21 Ibid.



**EUROPEAN
LEADERSHIP
NETWORK**

The European Leadership Network (ELN) is an independent, non-partisan, pan-European network of over 450 past, present and future European leaders working to provide practical real-world solutions to political and security challenges.

Published by the European Leadership Network, October 2025

Published under the Creative Commons Attribution-ShareAlike 4.0

© The ELN 2025

The European Leadership Network itself as an institution holds no formal policy positions. The opinions articulated in this paper represent the views of the author(s) rather than the European Leadership Network or its members. The ELN aims to encourage debates that will help develop Europe's capacity to address the pressing foreign, defence, and security policy challenges of our time, to further its charitable purposes

We operate as a charity registered in England and Wales under Registered Charity Number 1208594.

European Leadership Network
8 St James's Square
London, SW1Y 4JU
United Kingdom

Email: secretariat@europeanleadershipnetwork.org
Tel: 0203 176 2555

Follow us    

europeanleadershipnetwork.org

