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Behavioural Arms Control and the BWC Working Group: A New Framework for Assessing Efforts to Strengthen the Biological Weapons Convention, 2023–2026

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Executive Summary

The Biological and Toxin Weapons Convention (BWC) faces a persistent gap between its prohibition of biological weapons and its capacity to generate confidence in compliance. Rapid scientific advances, pervasive dual use, and geopolitical tensions significantly complicate efforts to strengthen the Convention through traditional verification. This paper applies behavioural arms control (BAC) to the Working Group's 2023–August 2026 negotiations, incorporating subsequent information through October 2026 and identifying priorities for the 2027 Tenth Review Conference.

BAC focuses on measures that enable, demonstrate, and support assessment of responsible conduct. It complements the Convention's legal prohibition without claiming that transparency proves compliance or that voluntary measures exclude concealment. The analysis examines four of the Working Group's mandate areas: international cooperation and assistance under Article X, science and technology review, confidence building and transparency, and compliance and verification. It distinguishes three outcome levels in the form of negotiated outcomes, institutional capacities, and behavioural effects, as agreement on report language does not establish an operational mechanism, and establishing a mechanism does not demonstrate changed behaviour.

The Working Group has made progress in its negotiations, particularly concerning cooperation and scientific advice. Prospective Article X arrangements could strengthen implementation capacities and practical partnerships, while an S&T review mechanism could support timely guidance and governance adaptation. Their behavioural effectiveness, however, remains to be demonstrated. Progress is weaker where measures would enable meaningful scrutiny, independent assessment, or clarification of sensitive activities. CBM recommendations were agreed ad referendum, but did not establish systematic analysis or follow-up. Similarly, compliance and verification discussions have opened procedural possibilities without substantive convergence on the scope of core measures or their legal status.

The paper argues that these areas should form a layered assurance architecture, in which cooperation enables implementation, scientific advice informs governance, transparency makes relevant behaviour assessable, and clarification addresses uncertainty. Their contribution to strengthening the BWC depends on connecting these functions and strengthening the politically contested transparency and clarification layers.

This leads to five priorities between now and the Tenth BWC Review Conference: (1) finalise and resource the Article X mechanism; (2) operationalise S&T review and connect advice to national practice; (3) establish a clear path from CBM submission to information use; (4) mandate sustained compliance work with defined procedures and outputs; and (5) assess all three outcome levels. These steps would not solve the BWC's verification problem, but could generate credible evidence of responsible implementation and strengthen confidence in compliance with the object and purpose of the Convention.

1 Introduction

The Biological and Toxin Weapons Convention (BWC) remains the central multilateral legal instrument expressing the norms against the development, production, acquisition, stockpiling, transfer, and use of biological weapons (BW). This notwithstanding, the BWC's institutional and practical capacity to generate confidence in compliance has long lagged behind the scientific, technological, and geopolitical conditions in which it operates. Its principal transparency instrument - the confidence building measures (CBMs) – is politically binding, but unevenly implemented, and insufficiently analysed. The collapse of negotiations on a legally binding compliance protocol in 2001 entrenched this structural deficit, while the intervening quarter century has seen rapid advances in the life sciences and biotechnology.[1]

Contemporary biological research, development, production, and public-health activity are deeply dual-use.[2] The equipment, expertise, facilities, data, and knowledge required for legitimate work on infectious diseases, vaccines, diagnostics, agriculture, and biotechnology may also be relevant to prohibited activities. Distinguishing peaceful from hostile intent is therefore difficult, particularly where potential indicators of concern are dispersed across civilian, commercial, academic, and military settings. The convergence of biotechnology with artificial intelligence, automation, advanced data analysis, synthetic biology, and other emerging technologies further complicates the task of maintaining confidence in compliance.[3] At the same time, intensified great-power competition,[4] wrongful accusations of prohibited biological-weapons activity,[5] and disagreements over transparency and international cooperation have reduced the prospects for a return to the comprehensive, legally binding verification negotiations of the 1990s.

The Ninth BWC Review Conference, held in 2022, responded to this situation by establishing a Working Group on the Strengthening of the Convention and tasked it with identifying, examining, and developing specific and effective measures, including possible legally binding measures. This paper concentrates on four areas of that mandate: international cooperation and assistance; scientific and technological developments; confidence building and transparency; and compliance and verification. These areas are most directly connected to the challenge of building assurance under conditions of pervasive dual use. They bring together questions of cooperation and equity, scientific governance, information sharing, and the means through which states parties can build and assess confidence in compliance.

The Working Group's significance lies in whether it connects cooperation, science and technology (S&T) advice, transparency, and clarification into a layered behavioural assurance architecture. These functions can reinforce one another, but their causal effects remain to be demonstrated. A possible functional progression is:

Article X capacity → S&T-informed governance → CBM transparency → clarification and assurance

1 Alexander Kelle and Malcolm R. Dando, "Behavioral Arms Control in the Century of Biology." *The Nonproliferation Review*, 32 (4–6), 2025, pp.261–81.

2 Filippa Lentzos, "Hard to Prove: The Verification Quandary of the Biological Weapons Convention," *The Nonproliferation Review*, 18 (3), 2011, pp.571-582.

3 See for example Sarah R. Carter et al., *The Convergence of Artificial Intelligence and the Life Sciences: Safeguarding Technology, Rethinking Governance, and Preventing Catastrophe*, Washington, D.C.: Nuclear Threat Initiative (NTI), 2023; Jaspreet Pannu et al., "Dual-Use Capabilities of Concern of Biological AI Models", *PLOS Computational Biology*, 21(5), 2025, e1012975; Benjamin D. Trump, et al., "Governing the AI-Biotech Convergence", *EMBO Reports*, 27(2), 2026, pp.259–264.

4 Alexander Kelle and Eva Siegmann, *Great Powers and the Norms of the BW Prohibition Regime*, CBWNet Working Paper No.9, Berlin: IFSH, 2023.

5 Una Jakob, *Instrumentalising Biological Weapons-Related Allegations: Russia's Compliance Politics and the Norms Against Biological Weapons*, CBWNet Working Paper No.15, Berlin: IFSH, 2024.

Feedback can run in either direction: reporting and clarification may expose capacity gaps or inform scientific-review priorities.

This paper applies behavioural arms control (BAC) to assess whether the Working Group's proposals enable and support the assessment of responsible conduct under conditions of pervasive dual use.[6] Although BAC does not depend on negotiated agreements, the present analysis examines the multilateral process from 2023 to 2026.[7] If that process fails, BAC could also provide a "plan B" and guide incremental strengthening of the BWC after its Tenth Review Conference.

The paper's central argument is that the Working Group has produced the beginnings of a behavioural-strengthening framework for the BWC, but not yet a layered assurance architecture. Its most tangible progress at the negotiation level has occurred in areas where strengthening can be framed as mutually beneficial cooperation, capacity building, and scientific monitoring and advice. These include the prospective international cooperation and assistance arrangements as well as the S&T review mechanism. By contrast, the most difficult areas are those where behavioural expectations would require meaningful transparency, outside assessment, or might risk disclosure of sensitive biodefence or commercial proprietary information.

At an informal UNIDIR–UNODA retreat in Montreux on 29–30 September 2026, participants considered outstanding issues related to cooperation and assistance, S&T review, and compliance and verification, alongside implementation planning for the two proposed mechanisms. These consultations sought to facilitate agreement and did not constitute a negotiated settlement.[8]

The paper does not claim that BAC can solve the BWC's verification problem. Behavioural transparency is not equivalent to proving the absence of prohibited capabilities or activities. Similarly, national oversight does not in itself establish full treaty compliance, and cooperative mechanisms cannot resolve allegations of non-compliance. Rather, the paper advances a more limited claim in that BAC can help build the behavioural, informational, and institutional conditions that make greater assurance possible. It can generate more credible evidence of responsible implementation, reduce avoidable ambiguity surrounding dual-use activities, improve the ability of the community of BWC states parties to respond to emerging scientific developments, and create practical incentives for states and non-state actors to demonstrate responsible behaviour that strengthens the norms against BW.

The analysis is based on an assessment of the progress of the Working Group up to its August 2026 session. Its primary sources comprise the Ninth Review Conference Final Document,[9] the Working Group Chair's revised draft report issued at the end of the ninth Working Group session, and official working papers, national statements, documentation produced by the BWC Implementation Support Unit, and contemporaneous meeting reporting.[10] Subsequent public reporting and statements are considered up to October 2026.

The remainder of the paper proceeds in four parts. The next section describes the BAC framework. It then examines progress related to the four selected mandate areas. A subsequent section considers the connections and tensions among these areas, especially the relationship between cooperation, transparency, and assurance. The final section draws out implications for the conclusion of the Working Group process during its tenth session in December 2026, and in the subsequent preparations for the Tenth BWC Review Conference in 2027.

6 Jane Vaynman and Tristan A. Volpe, "Dual Use Deception: How Technology Shapes Cooperation in International Relations," *International Organization*, 77 (3), 2023, pp.599-632.

7 Kelle and Dando, "Behavioral Arms Control in the Century of Biology," pp.272f.

8 See "Montreaux retreat advances work towards a stronger Biological Weapons Convention", UNIDIR, 2 October 2026.

9 *Final Document of the Ninth Review Conference*, document BWC/CONF.IX/9*, Geneva: United Nations, 22 December 2022.

10 See the overview page at https://www.cbw-events.org.uk/bwc-rep.html.

2 Behavioural Arms Control in the Context of the BWC

Behavioural arms control (BAC) provides a framework for considering how the BWC Working Group can strengthen the Convention under conditions in which traditional verification remains politically and technically difficult. BAC is not an alternative legal regime and does not necessarily substitute for eventual compliance and verification arrangements. It directs attention to measures that shape, enable, demonstrate, and, where appropriate, assess responsible conduct.[11] BAC emerged from reflection on the limitations of traditional arms-control approaches under conditions of geopolitical competition and rapid technological change.[12] In the BW context, the central challenge is therefore preventing the hostile misuse of the life sciences and biotechnology. The key behavioural question is whether states and other stakeholders act in ways that support the prohibition norms, reduce misuse risks, and increase confidence that peaceful, protective, and defensive activities do not cross into prohibited conduct.[13]

This focus is particularly appropriate because biological arms control operates under severe information constraints. Equipment, expertise, facilities, data, and knowledge may all have legitimate civilian, public health, commercial, agricultural, or defensive applications. The same laboratory, pathogen collection, production equipment, computational tool, or scientific knowledge may support vaccine research, disease surveillance, biodefence, industrial production, or an offensive biological-weapons programme. Conventional verification remains relevant in principle, but it cannot eliminate this ambiguity by technical means alone, particularly where states parties seek to protect commercially confidential or national-security-sensitive information.

BAC responds by emphasizing the quality and observability of conduct. It seeks to reduce the 'dead zone' identified by Vaynman and Volpe that is created by the low distinguishability and high civilian integration of most biotechnology.[14] It does so by expecting from states and other relevant actors more credible information about how potentially sensitive activities are governed, what safeguards are in place, and whether relevant actors are acting consistently with the BWC's object and purpose.

2.1 Three pillars of BAC

The BAC framework rests on three pillars: informality, responsibility, and multidimensionality. Together, they clarify the contribution that the four selected Working Group areas can make to a more credible BWC assurance system.

Informality recognizes the value of measures that are voluntary, politically binding, cooperative, or incremental. BAC does not reject legally binding arrangements: the BWC's Article I prohibition remains the foundation of any strengthening effort. It proceeds, however, from the recognition that states parties may be able to agree and implement useful compliance or assurance measures even where they cannot agree on a comprehensive, legally binding verification protocol.

A proposed measure may be BAC-compatible before implementation. Its effectiveness, however, requires evidence of changed conduct. Politically binding arrangements, including among subsets of states parties, can strengthen assurance through regular reporting, peer engagement, and reputational incentives, but participation alone does not demonstrate effectiveness.

[11] For an approach that also seeks to shape behaviour, but places more emphasis on deterrence and disincentives, see Nathan A. Paxton, *Disincentivizing Bioweapons. Theory & Policy Approaches*, Washington, D.C.: NTI, 2024.

[12] Ulrich Kühn and Heather Williams, "A New Approach to Arms Control. How to Safeguard Nuclear Weapons in an Era of Great-Power Politics," *Foreign Affairs*, 14 June 2023.

[13] On the challenges that biodefense activities can pose for the norms against BW, see Alexander Kelle and Malcolm Dando, "Biodefence as a challenge to the global norms against biological and toxin weapons: five problems and a potential solution," *Defense & Security Analysis*, 2026, pp.1-19.

[14] Jane Vaynman and Tristan A. Volpe, "Dual Use Deception", p.611.

Responsibility is the second and most important BAC pillar. In the BWC context, responsible behaviour means conduct that reduces the risk of hostile misuse of the life sciences, sustains the Convention's prohibition norms, and avoids activities that could reasonably generate concern about prohibited biological-weapons work. It applies first to states parties, but also to the actors whose choices shape the trajectory of biological research, biotechnology, biodefence, and public-health practice.[15]

Responsibility must be demonstrable rather than declaratory. In this context, meaningful evidence comes from practices such as sustained participation in cooperation arrangements, timely S&T engagement, high-quality CBM returns, contextual information on sensitive activities, and a readiness to use consultation and clarification processes in good faith. The purpose is to make responsible conduct observable enough to reduce avoidable ambiguity.

The multidimensionality pillar concerns both scope and participation. BW prevention cannot be accomplished by foreign ministries alone. Although states parties remain the Convention's legal subjects and decision-makers, relevant behaviour is distributed across a variety of actors, including national bureaucracies, public-health institutions, laboratories, universities, biotechnology firms, funders, professional communities, and military and civilian biodefence bodies.

2.2 Six principles for BAC in the BWC context

In previous work, we have identified six principles that underpin the adaptation of BAC to the BWC context: novelty, mutual benefit, international standing, rapidity, clarity, and demonstrable effectiveness.[16] Applied to the four Working Group areas, these principles indicate what a meaningful behavioural-strengthening agenda should seek to achieve.

Novelty concerns the need for approaches suited to contemporary biological risks and the current political environment. It does not mean novelty for its own sake. A measure is novel where it departs from ineffective routines or adapts an established tool to new conditions. For the Working Group, this may include combining cooperation arrangements, S&T review, improved CBMs, and graduated clarification practices in ways that focus more directly on behaviour and information than on the attempted measurement of capabilities alone.

Mutual benefit asks whether a measure produces security, public health, scientific, developmental, or institutional benefits for diverse groups of states parties. This principle is especially important for international cooperation and assistance. Arrangements that improve access to expertise, strengthen relevant capacities, and reduce common biological risks can align equitable peaceful cooperation with the broader objective of preventing hostile misuse.

International standing concerns the reputational incentives associated with responsible conduct. States can strengthen their diplomatic credibility and political authority by participating constructively in cooperation arrangements, engaging seriously with S&T review, providing credible transparency, and voicing and responding in good faith to compliance-related concerns.

Rapidity is essential because developments in the life sciences and associated technologies can emerge faster than the BWC's quinquennial review conference cycle. S&T arrangements should therefore be able to identify, assess, and communicate emerging developments in a timely manner. Rapidity also matters for transparency and consultation, as information that arrives too late to inform confidence or clarification has limited assurance value.

Clarity concerns whether a measure is comprehensible to the actors expected to implement it. This includes diplomats and national bureaucracies, but also researchers, laboratory managers,

[15] See Thilo Marauhn, "Multi-normativity and Multi-level Governance: Fresh Perspectives on the Strengthening of Norms against Chemical and Biological Weapons", in Barry de Vries (ed.), *Chemical and Biological Weapons. The Interconnectivity of Norms*, Leiden: Brill, 2026, pp.1-12.

[16] Kelle and Dando, "Behavioral arms control in the century of biology," pp.272-3.

funders, industry actors, and public-health practitioners. General calls for responsibility are insufficient unless they indicate what responsible conduct entails, how it should be implemented, and what information, support, or procedures are available.

Demonstrable effectiveness distinguishes BAC from symbolic assertions of treaty compliance. The relevant measures should be able to show that unilateral or cooperative measures produce practical capacity, that S&T review produces timely and usable advice, that transparency improves the quality and interpretability of available information, and that consultation or clarification helps address specific uncertainty. None of this requires unrestricted public disclosure.

BAC should consequently be viewed as a complement to, not a replacement for, the Convention's legal prohibition. Its practical contribution lies in making responsible behaviour feasible, demonstrable, assessable, and contestable under conditions of dual use uncertainty and political disagreement. The following section considers how far the Working Group's work in the four selected areas has progressed in that direction.

3 The BWC Working Group's Four Key Mandate Areas

Each mandate area is examined through five common headings: BAC relevance, measures considered, negotiated status, behavioural assessment, and remaining gaps. Short opening paragraphs establish the governance problem. Unlike our earlier application of Tinbergen's four questions,[17] this analysis distinguishes negotiated text, institutional capacity, and behavioural effects. In the Chair's draft, green text was agreed ad referendum, yellow text reflected informal agreement, and unhighlighted or bracketed language remained unresolved. No category constituted adoption of the final package. Thus, BAC-compatible negotiation outcomes are assessed separately from operational implementation and demonstrated behavioural change.

3.1 International cooperation and assistance under Article X

The problem of the potential conflict between international co-operation in biotechnology and export controls over biotechnology was built into the original Convention through Article X and Article III.[18] Article X has long been central to the BWC's political legitimacy, especially for states parties that see effective access to peaceful cooperation, capacity building, and technology as inseparable from the treaty's non-proliferation obligations. Yet its practical implementation has often remained weak and fragmented, dependent on bilateral initiatives, general commitments, and uneven access to resources, expertise, and technology. The contradictory views on whether export controls were a necessary contribution to prevent proliferation or a hindrance to development in poorer countries can be traced back easily for decades,[19] and have persisted as a significant point of contention in debates on strengthening the Convention.[20]

The question then is how Article X can be reframed into a meaningful reciprocal bargain rather than a continuing dispute between assistance priorities and non-proliferation concerns.[21] Some states parties view Article X as necessary for confidence, equity, and sustained commitment to the Convention. Others remain concerned that cooperation could be constrained by non-proliferation restrictions or create channels through which sensitive technology might be diverted. A BAC-

[17] Kelle and Dando, "Behavioral arms control in the century of biology," pp.271-272.

[18] For the BWC treaty text, see https://front.un-arm.org/wp-content/uploads/2020/12/BWC-text-English-1.pdf.

[19] Malcolm R. Dando, *Biological Warfare in the 21st Century. Biotechnology and the Proliferation of Biological Weapons*, London: Brassey's, 1994, chapter 10, pp.200 – 211.

[20] Alexander Kelle, Kathryn Nixdorff and Malcolm Dando, *Preventing a Biological Arms Race*, Stanford: Stanford University Press, 2012, chapter 6, pp.110 – 136.

[21] This issue is also discussed by Matthew P. Shearer et.al., "International Cooperation & Assistance in the Biological & Toxin Weapons Convention: Strengthening BWC Assurance through Article X", *Politics and the Life Sciences*, 45(2), 2026, pp.268-297, doi:10.1017/pls.2026.10021.

compatible reframing should seek to make peaceful cooperation more practical without weakening the Convention's prohibition against BW.

3.1.1 BAC relevance

As was amply demonstrated in the COVID-19 pandemic, modern biotechnology can provide enormous benefits when used for peaceful purposes. An effective Article X mechanism could allow states parties to demonstrate the BAC principles of informality, responsibility and multi-dimensionality through the involvement of scientists, technologists, public-health institutions, laboratories, relevant national bureaucracies, international organizations, and donors from diverse countries.

Article X is particularly relevant to the BAC principles of mutual benefit and international standing. States with stronger public health, laboratory, regulatory, and research capacities are better positioned to implement the Convention, manage dual-use risks, contribute to outbreak response, and participate in international information exchange. Cooperation can establish regular networks among national bureaucracies, scientific communities, technical agencies, and providers of assistance. Such networks may improve communication and generate practical confidence in states parties' implementation capabilities.

A credible cooperation mechanism can also reduce the perception that the Convention imposes asymmetric obligations on states with less developed scientific, technological, or public health infrastructure. States that provide, coordinate, or effectively use assistance can demonstrate commitment to the BWC's peaceful-purpose dimension and enhance their international standing. If well designed and implemented, the mechanism could be of mutual benefit, act quickly and produce demonstrable practical effects.

3.1.2 Negotiated status

Much of the draft text on international cooperation under Article X was agreed in the August version, although some provisions remained unagreed. Section A of the report on 'Recommended measures on international cooperation and assistance' included agreed language encouraging states parties to designate National Contact Points to facilitate communication of national priorities in life-science capacity-building with other states parties and the Implementation Support Unit. It also encouraged, upon request, advisory support for developing or updating national strategies and action plans, including those intended to enhance national capabilities for the peaceful application of biological science and technology.[22]

Further agreed provisions concerned improvement of the Article X database to facilitate capacity-building, including access to equipment, materials, and scientific information for peaceful purposes. States parties were also encouraged to promote biological security education and laboratory collaboration in order to facilitate international scientific exchange and collaboration. These measures point towards a more structured approach to identifying needs, matching offers and requests, facilitating partnerships, and making existing cooperation more visible.

Annex II set out a draft decision for the establishment of a mechanism open to all States Parties to facilitate and support the full implementation of Article X. Its principal elements were an International Cooperation and Assistance (ICA) Programme, an International Cooperation and Assistance Fund, an Advisory Group open to all States Parties, and a Steering Group of up to twenty-five States Parties to make recommendations on the Programme and allocation of the Fund. National contact points and an improved information or database function could connect

[22] Chairperson of the Working Group on the Strengthening of the Convention, *Revised draft final report of the Working Group on the Strengthening of the Convention*, document BWC/WG/9/CRP.1/Rev.7, Geneva: United Nations, 27 August 2026, pp.5- 6.

international BWC processes with relevant national ministries, public health institutions, research bodies, laboratories, funders, and other implementing actors.

However, significant questions remained unresolved. Paragraph 2, which proposed a forum where, for example opportunities and obstacles to international cooperation and assistance were identified, was not agreed. Nor was Paragraph 3, which called for a report on strengthening international cooperation and assistance under Article X, agreed. These disagreements show that some of the longstanding divisions over cooperation remain unresolved.[23]

3.1.3 Behavioural Assessment

There has been extensive discussion in the past about how international cooperation under Article X might be improved and, in that sense, this is not a novel idea. The more detailed specification of an International Cooperation and Assistance mechanism, however, is a significant institutional development. Its potential contribution extends beyond the provision of development-oriented assistance. Capacity built through Article X may support preparedness and response under Article VII, scientific and technological engagement, national implementation, biosafety, biosecurity, and disease surveillance.

The ICA package has the potential to shape behaviour in three principal ways. First, it can encourage states parties to identify and communicate national needs, offers, and implementation priorities more systematically. Secondly, it can enable practical cooperation among actors who do not normally participate directly in BWC diplomacy. Thirdly, if reporting and information functions are effectively designed, it can make Article X implementation more demonstrable.

The proposed ICA mechanism is compatible with BAC insofar as it enables cooperation whose implementation can be assessed. Its reporting arrangements could provide evidence of projects delivered, capacities strengthened, and participation by relevant national institutions. However, assuming a negotiated outcome can be reached by the Working Group, such agreement would establish neither its effectiveness nor behavioural change, both of which would require continuous monitoring and evaluation.

3.1.4 Remaining gaps

From a BAC perspective, the central remaining challenge is to transform Article X from a legal commitment into a functioning, trusted, and adequately resourced practical mechanism able to demonstrate responsible behaviour. Predictable funding, transparent and equitable allocation criteria, governance arrangements regarded as legitimate by both providers and recipients, clearly defined Implementation Support Unit support, and reporting arrangements that demonstrate practical outcomes will all be required. In a first step, however, some compromise text will be needed to resolve the still contested issues in the draft report to secure final agreement in time for the next Review Conference. Ultimately, however, an Article X mechanism will only be able to strengthen the Convention if it can show credible evidence that cooperation and capacity building are occurring in practice.

3.2 Science and Technology

Advances in science and technology were recognised as critical for the Convention from the beginning with Article XII requiring that review conferences should ‘take into account any new scientific and technological developments relevant to the Convention.’ In 1980, when the current revolution in biotechnology had hardly started, the three Depositary States produced a relatively

[23] Chairperson of the Working Group on the Strengthening of the Convention, *Revised draft final report of the Working Group on the Strengthening of the Convention*, document BWC/WG/9/CRP.1/Rev.7, Geneva: United Nations, 27 August 2026, pp. 15 - 16.

sanguine report for the First Review Conference.[24] However, by the time of the Second Review Conference concerns about scientific and technological advances had increased significantly and Sweden contributed a paper stating that there were potentially dangerous developments in several areas such as 'the insertion of genetic material coding for production of a potent toxin into a virulent organism that can infect human beings,' and at the 1991 Third Review Conference, amongst the State Level contributions, Canada circulated a study on *Novel Toxins and Bioregulators: the Emerging Scientific and Technological Issues Relating to Verification and the Biological and Toxin Weapons Convention*. These concerns about the risks (and the potential benefits) of the advances made during the last decades have continued to be central to the discussions of how to strengthen the Convention.[25]

The problem is first how to reach a consensus on the key risks and benefits in such rapidly changing circumstances, and then how to agree what might best be done if a consensus is achievable. During this century it has gradually become agreed that the Convention needs a Scientific Review Mechanism and the Working Group's report can be seen as the present culmination of the efforts to deal with at least the first part of the problem.[26]

3.2.1 BAC relevance

Continuous S&T review is relevant to BAC because it can connect emerging scientific knowledge with timely guidance for responsible conduct. Its character is in principle multidimensional, but depends on engagement with the scientific and technological communities whose practices affect BWC implementation, while its behavioural effect depends on whether that guidance informs national governance.

3.2.2 Negotiated Status

The material on science and technology of the August 2026 draft of the Working Group's text was almost all agreed, but with a few sections not agreed. [27] Section B of the report on 'Recommended measures on science and technology developments relevant to the Convention' had three paragraphs. In paragraph 9 states parties are 'encouraged to promote, develop or update awareness-raising tools… for relevant national stakeholders, in order to further the objectives of the Convention' and in paragraph 11 states parties are also 'encouraged to monitor any new scientific and technological developments … relevant to the Convention … and to continue to share, on a voluntary basis, their reflections.' However, paragraphs 10 and 10 (*bis*) of Section B that deal with the use of codes of conduct for scientists, even on a voluntary basis, were not yet agreed, or even informally agreed.

Annex III sets out the 'Draft decision for the establishment of a mechanism to review and assess scientific and technological developments relevant to the Convention and to provide States Parties with relevant advice.' This part of the text begins with six paragraphs under the heading 'The Review Conference of the States Parties to the Convention' and this makes clear the objective of the mechanism stating, in paragraph 3 '*Emphasizing* that such a mechanism is intended to carry out

[24] Malcolm R. Dando, *Biological Warfare in the 21st Century. Biotechnology and the Proliferation of Biological Weapons* London: Brassey's, 1994, chapter 7, pp.130-156.

[25] Alexander Kelle, Kathryn Nixdorff, and Malcolm R. Dando, *Preventing a Biological Arms Race,* Stanford: Stanford University Press, 2012, chapter 3, pp.34–60.

[26] United Kingdom of Great Britain and Northern Ireland, *Examples of advances in Science and Technology relevant to the Biological and Toxin Weapons Convention and worthy of review*, document BWC/WG/4/WP.6, 19 August 2024. In this context, see also InterAcademy Partnership, *Science and Technology Advisory Mechanism for the Biological Weapons Convention. A Proof-of-Concept Exercise*, Trieste, 2024.

[27] Chairperson of the Working Group on the Strengthening of the Convention, *Revised draft final report of the Working Group on the Strengthening of the Convention*, document BWC/WG/9/CRP.1/Rev.7, Geneva: United Nations, 27 August 2026, pp. 6 -7 and 25 – 31.

advisory and consultative functions and does not possess decision-making authority or rights on matters of policy.'

The mechanism is composed of three elements: first a Science and Technology Review Group of government experts (two from each State Party that wishes to take part); then a Science and Technology Reporting Committee of 25 experts drawn from the Review Group; and Temporary Working Groups set up as considered necessary. The Review Group prepares 'an annual report consisting of an initial general review and assessment of the specific scientific and technological topics related to the Convention as assigned by the Review Conference or States Parties.' The Reporting Committee will also 'prepare and transmit to States Parties an annual report on the assigned topics, which reviews and assesses scientific and technological developments relevant to the Convention, their implications for its implementation and effectiveness, and provides States Parties with relevant advice and recommendations.' If specific technical expertise is needed the Reporting Committee or any State Party may propose a Temporary Working Group to 'provide focussed scientific and technical analysis on a specific topic… that requires in-depth study.' The Temporary Working Group 'will provide a report to be submitted to States Parties, the Review Group and the Reporting Committee.' Additionally, the 'Chair of the Science and Technology Advisory Mechanism provides the Meeting of States Parties an annual summary of the Mechanism's activities.'

3.2.3 Behavioural assessment

The proposed mechanism is novel within the BWC and could support mutual benefit through shared expertise and recurring assessment. Its reports would make institutional activity visible, but would not by themselves demonstrate behavioural effectiveness. Assessment should therefore distinguish the production of timely, usable advice from its uptake in national guidance, funding decisions, oversight, and scientific practice. Constructive expert participation could enhance international standing, while rapidity would depend on the mechanism's ability to address emerging issues between BWC review conferences.

3.2.4 Remaining gaps

The remaining challenges concern both institutional design and national uptake. Discussions in August addressed consensus rules, reporting procedures, geographical representation, gender balance, and conflicts of interest, alongside unresolved codes-of-conduct language. A BAC assessment should ask whether the resulting arrangements protect scientific credibility, communicate usable advice, and reach researchers, funders, and regulators. Any S&T advice given and its uptake must therefore be evaluated separately.

3.3 Confidence building and transparency

Confidence building measures (CBMs) are the BWC's principal existing instrument for systematic transparency. Introduced in 1986 and subsequently expanded, they request states parties to provide annual information on matters including research centres and laboratories, national biodefence programmes, outbreaks of infectious disease and toxins, vaccine-production facilities, relevant legislation, and past offensive or defensive biological-weapons activities.[28] Their purpose is not to verify the Convention, but to reduce uncertainty and support confidence in compliance through a regular and structured information exchange.

[28] See Marie I. Chevrier and Iris Hunger, "Confidence-Building Measures for the BTWC: Performance and Potential," *Nonproliferation Review*, 7 (3), 2000, pp. 24–42; Gregory D. Koblentz and Marie I. Chevrier, "Modernizing confidence-building measures for the Biological Weapons Convention," *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, 9 (3), 2011, pp. 232–38.

The central problem is that CBMs have never generated the level of participation, completeness, comparability, accessibility, or analytical use necessary to fulfil this function consistently.[29] Submission rates have improved over time, but a substantial proportion of states parties do not submit returns in a given year. Returns vary considerably in detail and quality, many are not publicly available and there is no routine multilateral mechanism for analysing the information, seeking clarification, identifying good practice, or providing feedback to submitting states.[30] CBMs consequently have up to now remained more effective as a formal expression of a transparency norm than as a practical system of collective assurance.[31]

This problem is intensified by the dual-use character of biological activities. Information about laboratories, biodefence programmes, vaccine production, disease outbreaks, and research may be relevant to confidence in treaty compliance, yet it can also touch on commercial confidentiality, public health sensitivities, national-security interests, and concerns about reputational or political misuse.[32] The challenge for CBM reform is therefore to generate useful transparency without creating demands for disclosure that states parties consider disproportionate, unsafe, or as creating political vulnerabilities.

3.3.1 BAC relevance

CBMs are a direct and already existing instrument of behavioural confidence building. Their central expectation is that states parties regularly submit and contextualise relevant information, explaining the peaceful or protective purposes of reported activities. Public availability and appropriate scrutiny would strengthen this practice, but should not be confused with existing reporting obligations.[33]

This distinction matters. A CBM return does not establish that a state lacks prohibited biological weapons capabilities. Nor does the disclosure of a biodefence programme prove that all activity undertaken in its name is exclusively defensive.[34] However, high-quality, complete, regular, and publicly accessible submissions can provide meaningful evidence of compliance-oriented behaviour. They can show that a state accepts the legitimacy of transparency, maintains domestic structures able to gather relevant information, and is prepared to expose at least part of its implementation record to international and public scrutiny.[35]

CBMs thus are consistent with several BAC pillars and principles. They embody responsibility by encouraging states to make their relevant activities intelligible to others. They have an informal or politically binding character, but can still create regularized expectations and reputational incentives. They are multidimensional, because effective submission often requires coordination among foreign affairs, defence, health, science, agriculture, and regulatory authorities. They also

[29] See Riya Manas Sharma and Tom Hobson, "Gaps in transparency: understanding limited participation in confidence-building measures under the Biological Weapons Convention," *The Nonproliferation Review*, Vol. 32 (4-6), pp.283-309.

[30] See BWC Implementation Support Unit, *Background information document on 'Measures on confidence-building and transparency'*, document BWC/WG/6/2, Geneva: United Nations, 16 July 2025.

[31] On the notion of a transparency norm in the BW prohibition regime, see Alexander Kelle, *Prohibiting Chemical & Biological Weapons: Multilateral Regimes and Their Evolution*, Boulder, CO: Lynne Rienner, 2014, pp.63-67. On the potential of CBMs for increasing assurance, see also Matthew P. Shearer et al., "BWC Confidence-Building Measures: Increasing BWC Assurance through Transparency and Information Sharing", *Politics and the Life Sciences*, 44(1), 2025, pp.5-27.

[32] Jane Vaynman and Tristan A. Volpe, "Dual Use Deception".

[33] Implementation Support Unit, *History and operation of the confidence-building measures*, document BWC/CONF.IX/PC/3, Geneva: United Nations, 13 January 2022.

[34] Kelle and Dando, "Biodefence as a challenge to the global norms against biological and toxin weapons."

[35] On the potential utility of CBM Form E in this context, see Nicholas R. Cropper et al., "A Modular-Incremental Approach to Improving Compliance Verification with the Biological Weapons Convention", *Health Security*, 21(5), 2023, pp.421-427, DOI: 10.1089/hs.2023.0078.

have potential relevance for international standing and demonstrable effectiveness because consistent, transparent reporting can enhance a state's credibility, while poor participation or opaque returns can generate doubt.

3.3.2 Measures considered

The Working Group's discussion of measures to strengthen CBMs aimed at improving states parties' participation, submission quality, accessibility, analysis, and practical utility.[36] These include encouragement of annual submissions; possible revisions to forms and guidance; improved technical support through the ISU; better use of electronic submission systems; greater public availability; and mechanisms for exchange, peer learning, or review of submissions.[37] A recurrent objective has been to shift CBMs from a largely passive repository of national information toward a more dynamic transparency process.[38]

The BAC perspective gives particular importance to public availability and independent analysis. As we have argued elsewhere, annual submission and publication of CBM returns should become the standard behaviour of responsible BWC states parties.[39] Publicly accessible returns would enable not only other states parties, but also civil-society organizations, academic researchers, and technical experts to undertake broader comparative analysis than is possible when information is confined to individual governments. Such analysis could reduce the charge that national compliance assessments are inevitably politically biased and could facilitate identification of good practice, gaps, anomalies, and implementation trends.

Peer learning and voluntary review could further develop this logic. Rather than treating every inconsistency as evidence of non-compliance, such processes could help states parties improve the completeness, clarity, and usefulness of returns. They could also provide a less confrontational route toward clarification than the current options under BWC Articles V and VI,[40] allowing states to explain national circumstances, data limitations, or changes in relevant programmes.

3.3.3 Negotiated status

By the close of the ninth session, the draft recommendations on confidence building and transparency had been agreed ad referendum.[41] This represented textual convergence, not agreement on a comprehensive system for analysing submissions, providing feedback, or addressing omissions and ambiguity.[42]

The apparent procedural agreement reached masks continued political contestation. Agreement that CBMs should be improved does not necessarily imply agreement on who will assess submissions, what criteria will be applied, whether returns should be public by default, or what consequences should follow from persistent non-submission or inadequate reporting.

[36] The inclusion of CBMs in the Working Group's mandate is contained in *Final Document of the Ninth Review Conference*, document BWC/CONF.IX/9*, Geneva: United Nations, 22 December 2022, p.10.

[37] See for example European Union, *Position of the European Union and its Member States on confidence-building and transparency*, document BWC/WG/5/WP.19, Geneva: United Nations, 16 December 2024.

[38] See the overview provided by Richard Guthrie, *Fifth Session, second day: confidence-building and transparency*, report 2024-8, Geneva: BioWeapons Prevention Project, 4th December 2024.

[39] Kelle and Dando, "Behavioral arms control". For an analysis of past CBM returns see Riya Manas Sharma and Tom Hobson, "Gaps in transparency".

[40] Kelle, *Prohibiting Chemical and Biological Weapons*, pp.61-63.

[41] See Richard Guthrie, *The final day of the penultimate session and some reflections*, report 2026-12, Geneva: BioWeapons Prevention Project, 30th August 2026.

[42] Chairperson of the Working Group on the Strengthening of the Convention, *Revised draft final report of the Working Group on the Strengthening of the Convention*, document BWC/WG/9/CRP.1/Rev.7, Geneva: United Nations, 27 August 2026, p.7.

3.3.4 Behavioural assessment and remaining gaps

A strengthened CBM system could make responsible state conduct more visible in three ways. First, it could normalize the regular submission of comprehensive information. Second, it could encourage states to contextualize sensitive programmes – particularly biodefence, laboratory, and disease-surveillance activities – in ways that increase their distinguishability from prohibited activity. Third, it could establish a basis for collective learning and independent assessment.

However, the behavioural value of CBMs depends on more than submission numbers. Returns must be sufficiently complete, comparable, comprehensible, and accessible to allow meaningful use. A confidential, inconsistent, or purely formal return may satisfy a minimal procedural expectation while generating little assurance. Conversely, a publicly available return, accompanied by explanatory information and subject to informed analysis, can demonstrate a stronger commitment to transparency even if it cannot settle all compliance questions.

The principal remaining gap is the absence of an agreed pathway from information submission to information use. For CBMs to become an effective BAC measure, states parties would need to establish stronger expectations of annual participation and public availability; improve forms, guidance, and technical support; create non-punitive opportunities for feedback and peer learning; and develop procedures for identifying and discussing recurring implementation problems.

At the same time, each step toward a more meaningful analysis also moves CBMs closer to compliance assessment. This points to the limits (but also the utility) of BAC under present conditions. States may accept transparency as a general norm, but become more cautious when such transparency enables external actors to identify omissions, question national accounts, compare programmes, or draw conclusions about treaty compliance. BWC states parties should therefore seek to design a graduated system in which improved transparency, contextual explanation, peer learning, and independent analysis can strengthen confidence without prematurely becoming a surrogate for contested verification or an instrument of politicized accusation.

3.4 Compliance and verification

Compliance and verification constitute the BWC's most persistent institutional deficit. The Convention contains a comprehensive prohibition, but it lacks an implementing organization, mandatory declarations, routine inspections, or a standing mechanism for investigating compliance concerns.[43] Article V provides for consultation and cooperation in resolving problems related to the Convention's objectives or application, while Article VI permits complaints to the UN Security Council. In practice, neither provision has generated a reliable, depoliticized, and regularly used system for addressing allegations of non-compliance.

The underlying difficulty is both technical and political. Biological-weapons-related activities can be concealed within legitimate research, public health, pharmaceutical, agricultural, industrial, or biodefence work. The difficulties of establishing unique signatures of an offensive BW programme, the multi-use character of facilities and equipment, and the sensitivity of scientific, commercial, and national-security information all limit the effectiveness of conventional verification tools.[44] At the same time, states parties have continued to disagree about the appropriate scope of

[43] For an early analysis, including the Swedish campaign to amend the BWC at its first Review Conference in 1980, see Nicholas A. Sims, *The Diplomacy of Biological Disarmament. Vicissitudes of a Treaty in Force 1975 – 1985*, New York: St. Martin's Press, 1988.

[44] Vaynman and Volpe, "Dual use deception".

compliance assessment, the relevance of legally binding measures, the acceptability of intrusive access, the handling of sensitive information, and the political consequences of findings.[45]

This makes compliance and verification the most challenging issue area for applying BAC in the context of the BWC. The key question is whether behavioural measures can generate useful assurance, reduce avoidable uncertainty, and create more favourable institutional and political conditions for eventual compliance arrangements.[46]

3.4.1 BAC relevance

BAC is relevant in the BWC verification context because it offers a way of approaching compliance assurance that does not assume the verification problem can be solved immediately through a comprehensive declaration-and-inspection system. It shifts attention toward observable implementation behaviour: whether states adopt national measures, submit and publicize CBMs, clarify concerns, participate in peer exchange, enable managed transparency, monitor relevant legislation and publications, and establish domestic review systems for sensitive activities.

This approach is consistent with the Working Group's emerging modular discussion. The United States under the Biden administration in January 2024 distinguished transparency from verification, and invited consideration of annual legally binding declarations on some or all current CBM topics.[47] France has proposed a 'common basis' for considering compliance and verification measures; Switzerland's food-for-thought paper likewise treats assurance as a combination of mutually reinforcing tools rather than a single, comprehensive mechanism.[48] BAC can therefore be understood as a contribution to a layered compliance architecture, not as an alternative claim to definitive verification.

Transparency alone establishes neither responsible conduct nor full treaty compliance, and voluntary participation cannot exclude concealment. A state may submit CBMs and participate in cooperation while undertaking prohibited activity elsewhere. BAC can nevertheless improve implementation information and support consultation and clarification under Article V. These contributions complement, rather than replace, arrangements for addressing serious allegations, including the Article VI route through the UN Security Council and the separate UN Secretary-General's Mechanism for investigating alleged use.[49]

3.4.2 Measures considered

A BAC-compatible compliance agenda would include a range of conduct-oriented measures. Clarification procedures could provide structured, non-accusatory channels for states parties to raise questions about ambiguous activities or information. Article V consultations could be operationalized through clearer procedures, designated contact points, timelines, and expert support. Implementation review could examine national legislation, institutions, reporting practices, and relevant governance arrangements without purporting to verify all biological capabilities. The working paper submitted by Denmark *et al*. is particularly relevant because it

[45] For expert views on the meaning, function and objects of verification under the BWC see Ajey Lele, Jeremy Littlewood, Anastasia Malygina and Matthew P. Shearer, *The Focus and Function of BWC Verification*. UNIDIR, Geneva, 2024. https://doi.org/10.37559/WMD/24/CBW/04

[46] See Revill's "demonstrative verification" for a similar approach: James Revill, *Possible Models of BWC Verification*, UNIDIR, Geneva, 2024. https://doi.org/10.37559/WMD/24/CBW/03.

[47] United States of America, *U.S. Approach to the Working Group on the Strengthening of the Biological Weapons Convention*, document BWC/WG/3/WP.9, Rev.1, Geneva: United Nations, 4 January 2024.

[48] France, *A common basis to consider verification*, document BWC/WG/5/WP.6/Rev.2, Geneva: United Nations, 4 December 2024; Switzerland, *Food for Thought on Compliance and Verification*, document BWC/WG/5/WP.11, Geneva: United Nations, 2 December 2024.

[49] Maximilian Brackmann et al., "Assessing Readiness of International Investigations into Alleged Biological Weapons Use", *Emerging Infectious Diseases*, 2025, 31(7), pp.1294-1299, https://doi.org/10.3201/eid3107.240841.

frames compliance and verification as requiring a sustained process able to consider legal, technical, political, and institutional questions.[50]

Other measures could include voluntary peer review, in which states parties exchange experience and receive feedback on BWC implementation; invitational or managed-access visits to relevant facilities;[51] and the monitoring of publicly available information, including legislation, scientific publications, procurement patterns, and national policy documents. Such open-source or publication monitoring could identify issues warranting clarification and help build a more evidence-based discussion of implementation.

Voluntary peer review, invitational or managed-access visits, and systematic monitoring of public information could thus create a basis for clarification. None can establish non-compliance alone. A visit may, however, show how a facility is governed, whether oversight operates, and whether the host state will engage with external questions. Similarly, national implementation review cannot expose every concealed programme, but can demonstrate whether a State Party has built the legal, administrative, and professional infrastructure expected of responsible BWC membership. The EU's Working Group position supports this incremental logic: enhanced transparency and declarations may strengthen assurance, but should be situated within—not confused with—a broader compliance and verification discussion.[52]

3.4.3 Negotiated status

In response to the mandate given by the Ninth BWC Review Conference to engage in sustained multilateral discussion on compliance and verification after more than two decades in which the subject remained politically divisive, the Working Group has considered a future open-ended process focused on compliance and verification, thereby recognizing that the issue cannot be resolved during its mandate. Nevertheless, the core disagreements remain. States parties differ over whether future measures should be legally binding, non-binding, or mixed; whether compliance assessment should focus narrowly on Articles I and II or encompass the Convention's implementation in all its aspects; and whether intrusive tools such as visits, declarations, or investigations are feasible or desirable. Disagreement also persists over the institutional setting, authority, and decision-making procedures of any future compliance process. [53]

The result remains a procedural opening, not substantive convergence. In its First Committee statement of 19 October 2026, the EU supported an open-ended working group to develop a verification regime; Norway likewise supported a process addressing concrete compliance and verification measures. These positions indicate continuing political support for further work, not collective agreement on its scope, legal status, or institutional design.[54]

[50] Denmark, Kenya, Malawi, Montenegro, Norway, Panama, Singapore, Thailand and Uruguay, *Key considerations when relaunching the discussion on verification and compliance in the context of the Biological Weapons Convention*, document BWC/WG/3/WP.8/Rev.1, Geneva: United Nations, 7 December 2023.

[51] During the 1990s Ad Hoc Group negotiations, the European Union supported voluntary invitational visits to clarify declarations of relevant facilities and activities; groups of states parties tested such visits and reported their experience. These and similar measures remain available as behaviourally significant experiences and tools.

[52] European Union, *Position of the European Union and its Member States on compliance and verification*, document BWC/WG/5/WP.13, Geneva: United Nations, 16 December 2024.

[53] See the overview by Richard Guthrie, *Compliance and verification: discussions at WG6*, BWPP report 2025-10, 21 August 2025.

[54] Delegation of the European Union to the United Nations in New York, "EU Statement – UN General Assembly 1st Committee: Other Weapons of Mass Destruction (Cluster II)", New York, 19 October 2026; Permanent Mission of Norway to the United Nations in New York, "Statement on Other Weapons of Mass Destruction in the 1st Committee", New York, 19 October 2026.

3.4.4 Behavioural assessment and remaining gaps

BAC can generate useful assurance if it is assessed against realistic criteria. Its contribution is limited to producing more information, more regular interaction, clearer national expectations, and stronger evidence of implementation. It can help distinguish states that consistently engage in transparency, oversight, consultation, and responsible governance from those that do not. It can also create opportunities to address concerns at an earlier stage and in less adversarial formats.

The practical value of these measures depends on institutionalization. A voluntary visit that occurs once, without common guidelines or follow-up, will have limited effect. Conversely, a layered system combining CBMs, national implementation reporting, Article V clarification, expert support, voluntary review, and managed-access exchanges could produce cumulative assurance greater than any individual measure.

BAC should be understood as a bridge toward, and an enabling condition for, more ambitious assurance arrangements that may result in legally binding compliance or verification measures. By developing common expectations of transparency, normalizing consultation and clarification, strengthening national governance, and creating institutions capable of handling sensitive information, BAC measures may reduce some of the political and informational barriers that have obstructed verification negotiations.

The remaining gap is therefore twofold. First, states parties must determine whether they are prepared to move from general support for compliance to concrete procedures for assessing it. Second, they must decide whether behavioural measures will remain voluntary confidence building practices or become part of a structured, progressively institutionalized assurance system. Without the latter, BAC risks remaining at the level of responsibility rhetoric without credible mechanisms for demonstrating or testing whether that responsibility is being put into practice.

4 Connecting the mandate areas: from separate measures to layered assurance

The four mandate areas could generate cumulative assurance if their institutional functions are connected. Article X cooperation can provide the capacity to implement S&T-informed governance and prepare credible CBM returns. S&T review can inform both national oversight and the information relevant to transparency. Consultation and clarification can then make that information usable by addressing omissions, ambiguity, and concern. These connections would allow each layer to reinforce the others, rather than merely add another mechanism. Their combined contribution would remain assurance, not proof of the absence of prohibited activities.

The four areas nevertheless differ in negotiating progress and institutional ambition. Cooperation and scientific advice offer clearer opportunities for mutually beneficial agreement, although their funding and governance remain contested. Agreement ad referendum on CBM recommendations has not created systematic analysis or follow-up, while compliance and verification have secured only a procedural opening. The weakest connections therefore remain those linking transparency, scrutiny, and clarification.

The central tension remains in that each step that would make transparency more analytically useful, e.g. for analysing biodefence programmes, identifying omissions in reporting, questioning national accounts, moves confidence building closer to compliance assessment. Yet, this is precisely the terrain BWC states parties have been least willing to enter. Cooperation and scientific advice distribute benefits, but their governance remains contested. Usable transparency and clarification add the political costs of increased scrutiny.

This is why the distinction among negotiated, institutional, and behavioural outcomes matters for the synthesis and not only for the individual mandate areas. Broad political endorsement at the Tenth BWC Review Conference of a layered approach consisting of the four mandate areas analysed

does not by itself create the mechanisms that would operationalise it. Similarly, the establishment of mechanisms does not automatically change the practices of states parties and other stakeholders. The Working Group's record to date is strongest at the level of negotiated openings, uneven at the institutional level, and largely prospective at the behavioural level. Whether the four mandate areas can be developed into more than the sum of their parts will depend on decisions still to be taken – on resourcing the cooperation mechanism, operationalising science advice, converting transparency into usable and comparable information, and moving from general support for compliance work to concrete, agreed procedures.

5 Summary and Recommendations

The Working Group's record should be assessed through negotiated, institutional, and behavioural outcomes rather than a simple success–failure dichotomy. The following table separates provisional negotiating status from institutional provisions and further BAC proposals. Anticipated behavioural effects remain hypotheses to be tested through adoption, resourcing, and implementation.

Working Group area	Draft negotiating status	Institutional provisions and further BAC proposals	Anticipated behavioural effects
Article X cooperation	Partial agreement on contact points, advisory support, database improvement, laboratory collaboration and a draft cooperation mechanism	Draft: ICA Programme, Fund, Advisory and Steering Groups; national contact points	More systematic identification of needs and offers; practical partnerships; stronger implementation-relevant capacity
Science and technology	Broad convergence on a review mechanism; some unresolved issues, including codes of conduct	Draft: Review Group, Reporting Committee, Temporary Working Groups and annual reporting	Regular monitoring, expert participation, updated national guidance, stake-holder awareness and governance adaptation
CBMs and transparency	Recommendations agreed ad referendum; no systematic analysis or follow-up arrangements established	Existing: electronic platform and technical support. BAC proposals: feedback, peer learning and voluntary review	Regular, complete, contextualised, and more accessible reporting; improved national coordination
Compliance and verification	Procedural opening and possible continuation of work; no substantive convergence on core measures	Draft: continued multilateral work. BAC proposals: structured clarification, expert support, voluntary review and managed access	Good-faith consultation, explanation, response to concerns, participation in clarification and review

The immediate task is to conclude Working Group recommendations in December 2026, secure Review Conference decisions in 2027, and prepare the two proposed mechanisms for the expected operational start in 2028 discussed at Montreux. This timetable remains prospective: the measures adopted, their resourcing, and subsequent behavioural effects require separate assessment.

States parties should therefore:

1. ***Finalise and fund the Article X International Cooperation and Assistance mechanism, and resolve the outstanding text.*** States parties should agree compromise language on the provisions left unagreed at the ninth session, so that the mechanism, its Programme, Fund, Advisory Group, and Steering Group can be adopted with predictable financing, transparent and equitable allocation criteria, defined Implementation Support Unit support, and reporting arrangements that demonstrate practical outcomes. Without such resolution, the mechanism risks being established in name but unable to show that cooperation and capacity building are occurring in practice.
2. ***Operationalise the science and technology review mechanism and complete the codes-of-conduct language.*** States parties should adopt the Annex III mechanism with its Review Group, Reporting Committee, and Temporary Working Groups, settle its still-contested governance and consensus arrangements, and equip it to identify, assess, and communicate developments between review conferences rather than only at them. In parallel, states should agree language on voluntary codes of conduct for scientists, and establish channels through which the mechanism's assessments reach national scientific, funding, and regulatory communities, so that advice generated in Geneva can inform conduct in laboratories and institutions.
3. ***Adopt a time-bound pathway from CBM submission to CBM use.*** States parties should convert the confidence building measures from a largely passive repository into an instrument of collective assurance by agreeing concrete, sequenced steps: stronger expectations of annual participation and public availability; revised forms, guidance, and Implementation Support Unit technical and electronic-submission support; and non-punitive opportunities for feedback, peer learning, and the identification of recurring implementation problems. The approach should be layered so that improved transparency, contextual explanation, and independent analysis strengthen confidence without prematurely becoming a surrogate for contested verification or an instrument of politicised accusation.
4. ***Establish a structured, mandated compliance and verification process with agreed procedures and outputs.*** Building on the partial procedural opening achieved in the Working Group, states parties should agree an open-ended process on compliance and verification with a clear mandate, timeline, and deliverables, rather than a mere reaffirmation of the subject's importance. That process should be able to develop and test conduct-oriented, BAC-compatible tools, such as structured non-accusatory clarification channels, operationalised Article V consultation with contact points and timelines, national implementation review, and voluntary peer review or invitational and managed-access exchanges, while keeping open the question of eventual legally binding measures.
5. ***Connect the four mandate areas into a layered-assurance system and track all three outcome levels.*** States parties should adopt language and make preparatory arrangements that treat cooperation, science advice, transparency, and clarification as mutually reinforcing layers rather than separate issues. This should encompass the means to assess adopted text (negotiated outcomes), but also whether mechanisms are established and resourced (institutional outcomes) and whether the practices of states parties and relevant stakeholders actually change (behavioural outcomes). This includes assigning the Implementation Support Unit and the new mechanisms clear reporting and review functions so that future Review Conferences can judge the system by demonstrable effect rather than by declared intent.

The CBW network for the comprehensive strengthening of norms against chemical and biological weapons (CBWNet)

The research project CBWNet is carried out jointly by the Berlin office of the Institute for Peace Research and Security Policy at the University of Hamburg (IFSH), the Chair for Public Law and International Law at the University of Gießen, the Peace Research Institute Frankfurt (PRIF) and the Carl Friedrich Weizsäcker-Centre for Science and Peace Research (ZNF) at the University of Hamburg. The joint project aims to identify options to comprehensively strengthen the norms against chemical and biological weapons (CBW).

These norms have increasingly been challenged in recent years, *inter alia* by the repeated use of chemical weapons in Syria. The project scrutinizes the forms and consequences of norm contestations within the CBW prohibition regimes from an interdisciplinary perspective. This includes a comprehensive analysis of the normative order of the regimes as well as an investigation of the possible consequences which technological developments, international security dynamics or terrorist threats might yield for the CBW prohibition regimes. Wherever research results point to challenges for or a weakening of CBW norms, the project partners will develop options and proposals to uphold or strengthen these norms and to enhance their resilience.

The joint research project is being funded by the Federal Ministry of Research, Technology and Space for six years (April 2022 until March 2028).

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