

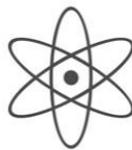
India–UK Strategic Nuclear Dialogue

18-19 January 2016
London

1-2 March 2016
Delhi

Meeting Summary

KING'S
College
LONDON



Project Alpha

Centre for Science and Security Studies
King's College London

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INSTITUTE FOR DEFENCE
STUDIES & ANALYSES

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Executive summary

The UK-India collaborative relationship on civil nuclear issues continues to strengthen. The memorandum on energy and climate change signed between Prime Minister Modi and Prime Minister Cameron in November 2015 was another positive step in what is a key bilateral relationship.

There are common strategic challenges confronting both India and the UK – particularly in the realm of emerging technologies. Cooperation and further dialogue on these issues and discussion of shared experiences will help address these challenges.

Discussion and dialogue on non-proliferation issues between India and the UK has moved well beyond India's non-participation in the Nuclear Non-Proliferation Treaty. India is open to finding new ways to contribute to the goal of non-proliferation. One area of mutual interest relates to strengthening measures related to UNSCR 1540.

Both legs of the India-UK Strategic Nuclear Dialogue proved to be a useful opportunity to build upon the frank discussion of nuclear and strategic issues of shared concern that took place during the course of the first leg.

The final Nuclear Security Summit represents an opportune moment to take stock of developments in the nuclear security domain and to consider next steps for improving security of nuclear facilities, stockpiles and radiological source material.

Several areas of future cooperation between the UK and India, such as export controls and nuclear governance, were identified as having a great deal of potential.

Event background

This dialogue was organised by King's College London and the Institute of Defence Studies and Analyses (IDSA) in order to explore how to strengthen the partnership between the UK and India on strategic nuclear issues. Over the course of the dialogue's two events, scholars, practitioners and officials from both countries explored a number of relevant topics in order to build common understanding and identify opportunities to further strengthen the relationship between the UK and India.

The dialogue was track 1.5, meaning that any officials participated in their private capacity unless otherwise indicated. The dialogue also engaged both the 'current' and the 'future' generation from both countries in order to encourage the creation of common understanding and relationships that endure into the future. It was held under the Chatham House rule.

This programme has been generously funded by the UK Foreign and Commonwealth Office (FCO).

This report

This meeting summary aims to capture general points of discussions during both legs of the dialogue, held at the Royal Society for the Arts in London on 18-19 January 2016 and then at the Institute for Defence Studies and Analyses in Delhi on 1-2 March 2016. The points made in this report are not attributed to any particular individual or organisation. This report is not meant to represent a formal position on the part of anyone present.

Meeting Participants

The events were attended by members of government and civil society, including from the Foreign and Commonwealth Office, Indian High Commission, the Indian Department of Atomic Energy, King's College London, IDSA, the United Services India, the Centre for Air Power Studies (CAPS), the University of Leicester, the Observer Research Foundation, and British and Indian Pugwash. A full list of participants is found at the end of this report.

Leg 1, London, January 18-19 2016

Opening remarks

Participants agreed it is a very positive time for enhanced cooperation in various nuclear and strategic fields between India and the United Kingdom. It is also a particularly interesting moment in non-proliferation. The nuclear deal with Iran has brought a positive phase in relations between Iran and other countries. Prime Minister Modi's visit to Pakistan has brought renewed hope of improved relations on the subcontinent. In the UK, the recent Strategic Defence Review has raised the issue of the future of the UK deterrent.

There are also pressing challenges in the strategic domain. North Korea's recent nuclear test, in contravention of UN Security Council resolutions, has highlighted the need for a robust international response to the problem of the DPRK's proliferation-related activities.

Participants acknowledged the need to develop the bilateral UK-India relationship on nuclear issues in and not to see India's non-participation in the Nuclear Non-Proliferation Treaty as a stumbling block in the way of enhanced cooperation.

Developing the India-UK strategic partnership: areas of common interest

India and the UK share many common security issues that affect our respective approaches to the nuclear domain. The need for energy security; ageing fossil fuel plants; and the need to address emissions to alleviate climate change affect both countries and are important strategic drivers. There is a clear need to improve nuclear technologies in both countries – and to share experience in decommissioning old technology – and collaboration can help drive development.

Collaboration in the civil nuclear field between India and the UK has been progressing incrementally since 2009 – the date of the first formal UK visit to the Bhabha Atomic Research Centre. A series of subsequent visits and bilateral engagements have culminated in the Civil Nuclear Co-operation Agreement framework, as well as the November 2015 signing of a memorandum of understanding between the UK and the Indian Department for Atomic Energy to encourage joint training and experience sharing on civil nuclear issues with the Indian Global Centre for Nuclear Energy Partnership (GCNEP).

Within the civil nuclear fuel cycle, there are several areas where UK-Indian collaboration is already delivering valuable research results. Projects on metallurgy; nuclear fuel; waste are all underway, with UK universities including Sheffield, Oxford, Manchester and Imperial reaping benefits of cooperation.

As research moves from the basic to the applied level, export controls are increasingly coming into play. While export controls are an important and necessary aspect of research collaboration in sensitive areas, the most restrictive aspect currently hindering collaboration is actually funding. There is vastly more potential research that could be undertaken, once funding streams become available.

A key concern in the industry space that may be inhibiting collaboration is the application of Indian liability law. Firms and government entities considering engagement in India's nuclear industry may be concerned about the application of Section 17D of the Liability

Act, the interpretation of which leaves some doubt as to supplier and operator responsibility in the event of incidents.

BMD, Cyber and conventional challenges to Strategic Stability

The information and technology era is presenting profound challenges to traditional concepts of security and strategic stability. Ballistic missile defence (BMD), precision strike capabilities, and developments in the cyber domain have led to what might be considered a revolution in nuclear affairs that may change orthodoxies of deterrence and stability.

Much of recent thinking in this respect has focused on Russia and China, but these capabilities are affecting far more states as they spread and proliferate. BMD capabilities are becoming more normalised. Precision strike technologies, while in their infancy, are spreading and becoming more widely available, and are increasingly being viewed as a potential conventional first strike tool.

Sub-nuclear capabilities are already presenting acute challenges in South Asia. In India, the sub-conventional threat presented by militants is clear. What outside observers see is a very plausible escalatory ripple scenario, where a militant attack leads to a conventional response which leads to a nuclear response which leads to escalation. And there are of course fundamental unknowables involved in this scenario. What would governments in the region be prepared to do? That is the scenario that has the rest of the world hypnotised.

In the cyber domain, the threat is both nebulous and pressing. There is a broad range of impact that cyber can potentially have across the nuclear weapon development and deployment process, from the point of research to the point of launch. And the advanced cyber capabilities of China, India and other players leave no doubt that cyber is already a key domain for the consideration of regional nuclear stability. It is also a domain that poses unique challenges in terms of verification and limitation – cyber is ‘the least verifiable domain imaginable,’ as one participant stated.

Participants considered that cyber security cooperation in the nuclear domain could be valuable. The existence was noted of a formal UK-India cyber dialogue that has been going for three years, which already involves key stakeholder agencies.

For India and the UK, all of these developments pose particularly tough questions. Will a single Trident submarine continue to represent a credible deterrent? Will India’s move towards BMD capability acquisition cause its adversaries to proliferate or diversify conventional or nuclear arsenals, or further pre-delegate nuclear authority? Perhaps it is the case that BMD can actually help in maintaining first strike stability. In the context of India’s neighbourhood, these challenges are particularly acute.

Strategic Stability (NATO, Russia and Asia)

Participants considered why strategic stability currently seems to be at a relative low point in the post-Cold War era. An important division seems to be competing conceptualisations of strategic stability held by NATO and by Russia.

NATO states – particularly the US – see Russian intervention in Ukraine as inherently destabilising, and an attempt to regain a sphere of influence that was diminished by the breakup of the Soviet Union. They note the resentful and explicitly revisionist tone of Russian public statements, the integrated model of military, political, economic, psychological and information warfare openly announced by Gen Gerasimov, the increase in Russian defence spending, which has doubled in the past decade; weapon modernisation efforts; and blatant nuclear sabre-rattling.

Russia, by contrast, sees its efforts as balancing destabilising US efforts that had been underway since the end of the Cold War. It could be perceived that Putin does not accept post-1990 settlement in Europe and wants it changed. Certainly, Russia's use of the phrase 'sphere of influence' in formal doctrines since 2000 suggests a competing worldview to that of NATO members.

British participants agreed that the Russian approach to strategic stability is motivated at least in part by Russian domestic issues. Domestic politics under Putin has motivated Russia's behaviour abroad. Protests in the 2010s scared the Kremlin and partly prompted the rise in defence spending and defence system modernisation.

It was acknowledged that old tools of strategic stability from the Cold War may have to be dusted off, and old practices of arms control re-learned. In particular, crisis management structures have played important roles in maintaining strategic stability in the Russian-NATO relationship.

In the context of India's neighbourhood, strategic stability was described as a more problematic concept. One participant described Indian security as wholly distinct from the Cold War model, particularly because of the multilateral nature of deterrence relationships in India's neighbourhood. India's principle of no-first use, while under pressure from asymmetric threats, is for the time safe. Both in Asia and in Europe there were potentially growing problems of sub-conventional aggression, emboldened by the threat of nuclear escalation, backed by large numbers of tactical weapons, against any conventional response.

Future efforts on non-proliferation and disarmament following the NPT REVCON 2015

Participant's view of the Nuclear Non-Proliferation Treaty (NPT) and its usefulness in the international context varied, and robust debate was held on the future of the NPT. One participant declared that the NPT had 'failed miserably'; that it was sinking under new challenges and that major powers were actively undermining it through sale of proliferation-sensitive technologies to others. Others noted general sentiments, particularly in the global South, that nuclear weapon states were not abiding by their disarmament commitments.

Others were much more positive about the NPT and its prospects. It was posited that the NPT has served the wider international community (and, indeed, India) quite well – including, amongst other benefits, by limiting the number of states with nuclear weapons far below the worst-case number envisaged by Kennedy and others in the 1960s. It was suggested that if India was indeed supportive of non-proliferation and disarmament, signing the NPT (and also the Comprehensive Test Ban Treaty) may be a powerful demonstration of this.

Participants agreed that most progress on disarmament and non-proliferation in the India-UK context would be made beyond the context of the NPT. There is room for broader governance on non-proliferation and nuclear security issues.

Implications of the outcome of negotiations with Iran; broader developments in West Asia and major power relations

Participants considered the process of nuclear negotiations between Iran and the E3+3 states (China, France, Germany, Russia, the US and UK) as well as the outcomes embodied in the Joint Comprehensive Plan of Action (JCPOA) and UN Security Council Resolution 2231.

The concept of ‘nuclear hedging’ was used to characterise Iran’s nuclear programme up to 2013 – Iran had moved from a direct pursuit of nuclear weapons to pursuing a latent capability with a possible future weapons option. There is now the precedent of Iran exploiting its civil nuclear capability to develop hedged capability. Other countries may want to live up to this, whether Saudi Arabia or others. The requirement exists, therefore, to get very good at how to manage future hedging of other countries

The profound regional implications of the Iran nuclear deal were noted. Saudi concerns about possible changes in regional dynamics are a key implication of the deal, with regional rivalry and antagonism coming to the fore since the renewal of negotiations with Iran in 2013. Prestige is in play as much as security is: in Saudi discourse there is a definite political strand of argument that whatever Iran has Saudi must have.

Also considered were implications for the non-proliferation regime. Past cases of significant proliferation that were resolved – such as Iraq in 1991 and 2003, Libya in 2003-4 to 2004 – involved demands on part of outside powers that were total and complete rollback of nuclear programmes. In Iran this this has not been the case. There is a recognition that Iran can enrich uranium (which is essentially the most sensitive aspect of Iran’s fuel cycle), albeit with lots of technology locked up. For the non-proliferation regime, this sets a precedent that there are different ways to resolve nuclear crises and potential proliferation concerns than just rollback.

Iran’s claim that the JCPOA represents an acknowledgement of the country’s ‘right to enrich uranium’ was also scrutinized. Historical documents from the period of NPT development put this into question. It was acknowledged that whether this interpretation is perceived as legally sound or not, the vast majority of states parties to the NPT understand the NPT as giving an absolute right to peaceful nuclear technology, including uranium enrichment, so long as it is not in contravention of the other articles of the treaty.

The Comprehensive Review of UN Security Council Resolution 1540 and efforts to boost national implementation.

Considerable resources have been devoted at the state and international level to the implementation of UN Security Council Resolution 1540, but considerable challenges remain if full implementation of the resolution is to be achieved. Particular areas for scrutiny under the Comprehensive Review that will take place in 2016 include the lack of capacity in some member states; verification methods to ensure that reported implementation is sound; and new technological challenges, such as additive manufacturing.

India's experience with implementation of the resolution may be helpful for other states. India has reinforced its legislative and regulatory mechanisms relevant to strategic trade controls – including the country's WMD Act and Foreign Trade Act.

National implementation of the requirements of resolution 1540 is also being assisted by other programmes, including nuclear security training undertaken by King's College London. These efforts attempt to move beyond physical protection methods to recognise the importance of the human element in nuclear security culture. Bridges between academia and industry are recognised as key to the implementation of nuclear security requirements and those of 1540 more generally.

India's entry to the export control regimes: practical next steps

A comprehensive overview of India's technological, legal and regulatory developments of relevance to the major export control regimes was presented. It was agreed that on the basis of India's excellent track record with respect to export control implementation, that India is in a strong position to enter the Nuclear Suppliers Group and other key regimes. Moreover, as a major producer of many key proliferation-sensitive pieces of nuclear-related technology, India's participation in the global export control framework is particularly timely.

Questions were raised as to how best provide for India's entrance into the major export control regimes, particularly with global political issues – including some unrelated to export control, as was seen at the 2015 Missile Technology Control Review – being a key impediment to Indian membership. It was acknowledged that India has been making substantial diplomatic efforts to gaining membership, but creative diplomacy will still be required to overcome political hurdles.

Some options were considered. An Indian application to join the Proliferation Security Initiative might be used to further demonstrate commitment to export controls and willingness to engage in the multilateral counter-proliferation domain. Bilateral discussions between India and China might help to assuage Chinese push-back on Indian membership.

Leg 2, Delhi, March 1-2 2016

Opening Remarks

The discussion began by highlighting the positive and frank discussions that took place during the course of the first leg.

Asian Strategic Security Landscape

Participants heard that the security landscape in Asia is in flux, characterized by the complexity of the traditional set of strategic alignments, as well as new and developing ones. Participants heard that this is a consequence of the ongoing shift of economic power to Asia, leading to increasing levels of tension and competition in the region. The strategic paradigm within Asia is one that is defined by strategic hedging, and multiple centres of power, further complicated by the reality that every nuclear weapons state has a presence in Asia.

In this context the rise of China is seen as both an opportunity and a threat. Despite the complexities inherent in India's relationship with China, the India-China relationship has been normalised somewhat, and is now based on a firm Indian stance when it comes to territorial matters, but a proactive approach to economic cooperation and partnership.

Apart from the rise of China, several other issues were identified as particular South Asian strategic security concerns. Pakistan's involvement with the sponsorship of terrorist groups remains for example a key issue within India, although it was noted that there is reason to believe that sponsorship of terrorism is seen as increasingly counterproductive within Pakistan. In light of the Iranian nuclear deal, a more pressing issue may be Pakistan's relationship with Saudi Arabia, who may harbor nuclear ambitions of its own. Within the wider regional context, North Korean nuclear and missile activities were cited as a source of strategic tension. The entire Middle East region was cited as a current source of uncertainty. It became clear through the course of this discussion that the South Asian view of the current regional security landscape was influenced not just by local issues, but also more far-reaching global security concerns.

Opportunities for the 2016 Nuclear Security Summit meeting

The Nuclear Security Summit (NSS) has accomplished a great deal. The setting up of international centres of excellence around the world has been, for example an important and tangible step in the enhancement of nuclear security globally. But as the NSS process ends, an important question to ask is what kind of nuclear security instruments might take its place? Instances of illicit trafficking have been increasing in number in recent years. It is likely that the post-NSS security regime will be characterized by a patchwork of many different treaty commitments. It is thus more important than ever to establish a process to continue the international dialogue on security issues and maintain a comprehensive approach.

The role of the Global Centre for Nuclear Energy Partnership (GCNEP), which was set up to produce sustainable and constant improvement in nuclear security and possible areas of cooperation between the GCNEP in India and the Department of Energy and Climate Change (DECC) in the UK, served as a focal point of discussion. This was considered a particularly promising avenue for cooperation in light of the Prime Minister Modi and Cameron's joint statement in November 2015 which mentioned the GCNEP as a specific area where the UK and India could and should cooperate.

Several specific areas of potential future collaboration were identified: awareness raising; responses to civil nuclear incidents; the development of proliferation-resistant systems; and an accreditation methodology that establishes an internationally recognized and standardized approach to nuclear security. Also raised was the possibility of collaboration in the evaluation of the potential of thorium as an alternative to uranium; and a regional Nuclear Security Summit apparatus in South Asia.

Strengthening export control governance

Discussions on strengthening export control governance began with an exploration of the current global non-proliferation apparatus. It was noted that information exchange within the four non-proliferation regimes has a somewhat skewed benefit, and non-members are not included in this exchange. A degree of transparency does exist, with outreach meetings and technical briefings taking place. These are beneficial, but of limited value. It was suggested that, for the regimes to become more relevant, membership should be expanded based on merit, with this merit being assessed by looking at like-mindedness, export control infrastructure, and level of experience. This meritocratic approach would almost certainly result in India's inclusion.

Detailed discussions also took place with regards to export controls during this session. An initial focus of this discussion related to India's prospective membership of the export control regimes. It was highlighted that India had a 'good story to tell' but that more opportunities could be taken to tell it.

Export controls in India conform largely to the guidelines of the regimes. In some respects it was argued that Indian export controls are in fact stricter than in any other countries. For example, Indian export controls apply to all Indian passport holders regardless of where they are in the world. India is also engaged in some way with all of the control regimes, and actively involved in outreach visits. How then can India's membership in the international non-proliferation regimes be secured? Fundamentally, the NSG requires a policy for non-NSG members to join. It was broadly agreed during the session that India's non-NPT status is a factor that the NSG has to consider when weighing membership, but it should not be seen as a requirement for membership in itself. Furthermore, it was argued that discussion of India's membership should be decoupled from any questions regarding Pakistan.

Participants heard that the issue of denials of export licenses to India by the UK has the potential to undermine strategic trust between the two countries. However, it was noted that the percentage of denied exports to India is comparatively very low (less than 1%), and denials usually result from criteria enacted to ensure that treaty commitments are adhered to. Moreover, India is a unique destination when it comes to exports as every potential

license refusal for India has to go to a minister to be countersigned. This is not done for any country and speaks to the commitment on the side of the UK to facilitate trade between the two states as much as possible.

Global implementation of UNSCR 1540 was referred to as a “mixed bag”, with many countries yet to adopt export controls, despite the resolution being over 10 years old. The lack of enforceability of the resolution was raised as a significant factor that may be preventing it from reaching its potential. Improving the assistance mechanism through mentorship programmes, customised training and other measures was identified as a route to better results.

Non-proliferation, Export Control and intangibles

Participants heard that India has continued its stance of support for the negotiation of a Fissile Material Cut-off Treaty (FMCT) at all stages, supporting the Shannon mandate consistently. A non-discriminatory treaty has been a key concept for the India, as is verification. India therefore would not want the Shannon mandate, which emphasizes verification, to be replaced. Similarly, it was highlighted that the UK shares this commitment and similar priorities when considering the shape of an FMCT. It was noted however that only by having a restriction on reprocessing and enrichment *and* the Additional Protocol in place that a regime fit for purpose will be created, and also fit for disarmament.

It was apparent that the UK and India each of mutual interests in supporting the full implementation of resolution 1540. A distinction was drawn between resolution 1540 and the Committee and Group of Experts related to 1540 at the UN. It was clear that participants felt that the 1540 Committee and Group of Experts could be playing a more proactive role in striving for full implementation of the resolution. In this context, it was suggested that India detailed consideration be given around how to strengthen the 1540 mechanism – particularly during the comprehensive review. It was also proposed that India should include stronger language in support of UNSCR 1540 in its annual general assembly resolution related to preventing non-state actors from acquiring WMD.

Emerging technical challenges

Participants heard that technological challenges are emerging in every area of the nuclear equation.

In the civilian context, India is one of the fastest growing economies. Population is increasing, so too is electricity demand. Nuclear power is seen as an important, low-carbon source of electricity. However, the adequacy and sustainability of global and domestic uranium resources is an emerging challenge. Similarly the need to construct proliferation-resistant systems, improve fuel efficiency, and minimise nuclear waste, all pose challenges of their own. A three-stage Indian nuclear fuel cycle that capitalises on India’s abundant thorium supply was highlighted as a key avenue being explored.

Within the strategic nuclear context, India is also working through several technical challenges in its pursuit of a secure strategic nuclear capability. Naval propulsion is an area of significant focus, as India pursues a quiet SSBN capacity. India and the UK’s history of

technical naval cooperation since independence was highlighted as a significant facilitating factor in India's current naval proficiency.

Emerging technical challenges to effective strategic trade controls were mentioned as an area that requires significant thought. Cloud computing services were raised as having the potential to significantly alter our understanding of intangible technology controls, perhaps requiring a reexamination of certain definitions used in national legislation. Additive manufacturing was also identified as a fast-maturing technology that had the potential to drastically change the supply chains of strategic and dual-use goods and more than the machines themselves, it is the related digital blueprint files that pose the biggest challenge to the effective regulation of 3D printing technologies within the context of nuclear and missile related non-proliferation.

Finally, participants heard that BMD, precision strike, cyber and other technologies are propelling us toward a more complex and challenging techno-military nuclear environment, and increasingly impacting the way that states view nuclear weapons, strategy and the global order. Of course this view point will vary, in the UK context, the deterrent effect of Trident and its successor may be undermined whereas in India, these new technologies may have profound impact on crisis management.

Developing the India-UK strategic partnership: future opportunities and takeaways.

The Indian-UK relationship was referred to as a contemporary one. It is built on a broad commonality of outlook regarding the response to global challenges, an increasingly deep financial relationship, a large and active Indian diaspora in the UK, and significant scientific and cultural cooperation, which in turn provides a basis for cooperation in other areas.

Strategic elements of our partnership are now so commonplace that they are not considered noteworthy by the media. Science and technology is one of the most dynamic and promising areas for cooperation.

In the UK, the progress made on UK-India civil nuclear cooperation is seen as a key success story. In India too, the agreement is seen as breaking new ground, but importantly falls into the broad pattern of science and industrial cooperation.

Next Steps

A key purpose of the dialogue was to identify not just areas of potential collaboration but, more specifically, potential follow-up activities. Such activities were discussed and several were identified.

Export Controls: it was noted that India's export control system is mature and that India is ready for regime membership. India should join the Missile Technology Control Regime and the Nuclear Suppliers Group within a year. Certain specific suggestions were made to facilitate membership of other regimes. Suggestions included harmonisation of Australia Group and Wassenaar Arrangement lists with India's SCOMET list. It was suggested also that India could do more to tell the good story of its implementation of export controls. In this context, Rajiv Nayan and Ian Stewart agreed to update their paper entitled "India and Export Controls".

Beyond the question of regime membership, the focus of the discussion was on sharing information, experience and effective practices. It was suggested that a study be made of available licensing and trade data to identify areas where trade could be facilitated. It was also suggested that India could agree to participate in the EU P2P outreach program on dual-use goods both where applicable, as a recipient and actively as a mentor to other countries.

Several areas of cooperation on export control issues were discussed. One might be joint efforts to identify and improve controls (beyond those developed for the already recognised problem of MANPADs) on portable conventional or sub-conventional military technologies with the greatest potential strategic impact, such as volumetric explosives, whose use could turn an ugly terrorist incident into an unbearably provocative cause for war.

It was agreed that it would be fruitful to expand and systematise dialogues on export control and non-proliferation matters. It was agreed that it would be beneficial for KCL to share its experience of engaging UK universities in export control issues with Indian partners.

Nuclear governance: It was agreed that a fruitful area of future cooperation could relate to nuclear governance. Ian Stewart mentioned KCL's plan to host a dialogue between advanced non-member states and the export control regimes. There was an agreement also to consider how UN Security Council resolution 1540 could evolve and change to best support nuclear governance. A particular suggestion was made to incorporate stronger language in support of resolution 1540 in India's annual General Assembly Resolution on preventing non-state actors from acquiring WMD.

During the dialogue, the cooperation between India's Global Centre for Nuclear Energy Partnership (GCNEP) and the UK's Department of Energy and Climate Change (DECC) was strongly recommended. India's GCNEP has already signed a Memorandum of Understanding with the UK. At the governmental level, details of the cooperation between the GCNEP and DECC need to be worked out. The UK and India both have rich experiences in managing issues relating to nuclear security. The cooperation between two organisations will facilitate institutionalisation of sharing experiences.

Future strategic cooperation: It was agreed that a particularly fruitful area for cooperation could relate to cyber risks to nuclear safety and security. Some participants in the dialogue underlined the need for negotiations of the Fissile Material Cut-Off Treaty on the basis of Shannon mandate. It was suggested that any effort to undermine the Shannon mandate may give a major setback to the impending non-proliferation regime. The meeting considered cooperation on the maritime issues, including security in the Indian Ocean and naval propulsion. India and the UK need to work together to deepen cooperation on naval propulsion.

It was also agreed that it would be beneficial to hold regular but periodic dialogues. Consideration will also be given to the establishment of two working groups; one on export controls and one on emerging technological challenges to strategic stability. Finally, it was agreed that it would be positive for British Pugwash and India Pugwash to find areas to cooperate in relation to strategic nuclear issues, including on disarmament.

Participants

- Dr. Arvind Awati, Scientific Officer, Strategic Planning Group, Department of Atomic Energy
- Dr. G Balachandran, Consulting Fellow, IDSA
- Mr. Krishnendu Banerjee, Second Secretary(Political), High Commission of India, London
- Mr. Ashok K Behuria, Research Fellow, IDSA
- Mr. Arka Biswas, Junior Fellow, Observer Research Foundation
- Professor Wyn Bowen, Head of Department and Dean of Academic Studies, Defence Studies Department, King's College London
- Dr. Shalini Chawla, Senior Fellow, Centre for Air Power Studies (CAPS)
- Dr. Andrew Futter, Senior Lecturer in International Politics, University of Leicester
- Professor Robin Grimes, Chief Scientific Adviser to the UK Foreign & Commonwealth Office
- Dr. Reshmi Kazi, Associate Fellow, IDSA
- Dr. Roshan Khanijo, Research Fellow, IDSA
- Mr. Luca Lentini, Project Coordinator and Research Associate, King's College London
- Mr. Arvind Madhavan, Ministry of External Affairs, Government of India
- Dr. Priyanjali Malik, Independent Researcher
- Mr. Ranjan Mathai, Former Indian Foreign Secretary and High Commissioner to the UK
- Mr. Ryan Mitchell, FCO Desk Officer, India
- Dr. Matt Moran, Senior Lecturer, King's College London
- Dr. Rajiv Nayan, Senior Research Associate, IDSA
- Dr. Jagannath Panda, Research Fellow, IDSA
- Mr. Kapil Patil, Research Associate, Indian Pugwash
- Mr. Jayand Prasad, Director General, IDSA
- Dr. Ramaseshan Ramachandran, Science Journalist
- Mr. Christopher Rees
- Dr. Meena Singh Roy, Research Fellow, IDSA
- Mr. Daniel Salisbury, Academic Coordinator, Centre for Science and Security Studies, King's College London
- Admiral Arun Kumar Singh Lieutenant General PK Singh, PVSM, AVSM (Retd)
- Mr. Paul Schulte, Senior Visiting Fellow, King's College London, Honorary Professor Birmingham University Institute of Conflict Cooperation and Security, and Senior Non- Resident Associate at the Carnegie Endowment Nuclear Policy Program
- Ms. Anna Sliwon, Consultant, British Pugwash
- Mr. Ian J. Stewart, Head, Project Alpha, King's College London
- Amb. Phunchok Stoban, Senior Fellow, IDSA
- Mr. Robert Tinline, Head Counter Proliferation Department, UK Foreign & Commonwealth Office
- Mr. Dominic Williams, Researcher, Project Alpha, King's College London
- Dr. Heather Williams, MacArthur Fellow, King's College London