HM Government

UK International Chemical, Biological, Radiological and Nuclear Security Assistance Programmes

and their Contribution to the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction

Report 2013–2015

Foreword

The UK's National Security Strategy identifies a chemical, biological, radiological or nuclear attack by international terrorists as a Tier One (highest) Priority Risk. An attack by another state or proxy using such weapons is considered a Tier Two Priority Risk. UK programmes make a crucial contribution to addressing these risks by seeking to put chemical, biological, radiological and nuclear materials beyond the reach of terrorists and hostile states. We coordinate the delivery of these programmes with our international partners through the Global Partnership against the Spread of Weapons and Materials of Mass Destruction.

UK programmes are reducing the threat of nuclear and radiological attacks and making an important contribution to the aims of the Nuclear Security Summit process. The Nuclear Security Summits, held in 2010, 2012 and 2014, brought world leaders together to discuss this important issue and demonstrated the high level of determination within the international community to bring about strengthened global nuclear security. The UK looks forward to the fourth Summit, which will be hosted by President Obama in Washington DC next year.

The outbreak of Ebola in West Africa in 2014 highlighted the threat from infectious disease, the importance of biological safety and security, and the importance of biological research for peaceful purposes. Strengthening capacity overseas to detect, identify and, where appropriate, secure dangerous pathogens can help in addressing disease threats of both natural and deliberate origin: the preparation and response required are similar. The UK continues to work with its international partners to promote safe, secure, transparent and ethical biological research.

Strong international cooperation is key to achieving shared security objectives. The UK, in conjunction with its partners, will continue to drive progress in the field of international chemical, biological, radiological and nuclear security, ensuring that the unique skills and expertise of the UK add value to Global Partnership activities in 2015/16 and beyond.

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1 Background

1.1 UK Strategic Context

In October 2010, the Government published the UK's National Security Strategy (NSS) (1), which outlined our appraisal of Britain's role in the world, the risks to our security and their implication for the UK. The Strategic Defence and Security Review (2), published alongside the NSS, set out the ways and means by which the UK will deliver the objectives in the NSS.

The NSS identifies three tiers of national security priority risks: Tier One being that group of risks which the National Security Council considered to be of the 'highest priority for UK national security'. Tier One risks include 'International terrorism affecting the UK or its interests, including a chemical, biological, radiological or nuclear (CBRN) attack by terrorists'. Tier Two risks include 'An attack on the UK or its Overseas Territories by another state or proxy using chemical, biological, radiological or nuclear (CBRN) weapons'. The NSS therefore identifies countering the proliferation of CBRN materials and knowledge as one of its highest priorities. The Strategic Defence and Security Review committed to building security capacity overseas, including through Global Partnership programmes, and prioritised the security of nuclear, biological and chemical materials and expertise.

The 2012-2015 National Counter Proliferation Strategy (3) sets out the framework for the UK's counter proliferation activity. The strategy has three main objectives:

- to deny access to CBRN materials and expertise by terrorists;
- to prevent acquisition by states of capabilities and their means of delivery (whether conventional or CBRN) which would threaten stability and UK vital interests, including our armed forces overseas; and
- to support, strengthen and extend the rules-based international system of counter proliferation treaties, regimes and organisations that underpins global security and prosperity.

The UK's activities under the Global Partnership—often delivered in collaboration with international partners—aim to support one or more of these objectives. Counter proliferation activities also contribute to the UK's Counter-Terrorism Strategy (CONTEST) (4)—specifically the *Protect* element of the strategy, which seeks to strengthen the UK's protection against a terrorist attack, either within the UK or against its interests overseas.

1.2 International Context

Proliferation of CBRN materials and expertise is of international concern, and this is recognised in multilateral treaties, conventions and resolutions. United Nations Security Council Resolution 1540 (UNSCR 1540) requires the adoption and enforcement of controls to prevent non-state actors from acquiring chemical, biological and nuclear weapons (5). The Nuclear Non-Proliferation Treaty has three mutually reinforcing pillars on non-proliferation, disarmament and peaceful uses of nuclear energy (6). The Biological and Toxin Weapons Convention prohibits the development, production and stockpiling of biological and toxin weapons (7). The Chemical Weapons Convention outlaws the production, stockpiling and use of chemical weapons (8).

Global Partnership Against the Spread of Weapons and Materials of Mass Destruction

The Global Partnership was launched at the 2002 G8 summit held in Kananaskis, Canada. It was originally set up as a 10-year initiative, supporting programmes on non-proliferation, disarmament, counter-terrorism and nuclear safety. Initially focussed on the legacy of the Cold War in states of the Former Soviet Union, priorities included destroying chemical weapons, dismantling decommissioned nuclear submarines, disposing of fissile materials, and redirecting former weapons scientists to peaceful civilian work.

Since 2002, the Global Partnership has achieved substantial progress in all areas identified as initial priorities. In accordance with the Kananaskis principles, work has also taken place in other areas, including improving the physical protection of nuclear and radiological materials, combating illicit trafficking, improving export controls and strengthening biological security.

With the original 10-year mandate due to end in 2012, the 2011 G8 Summit in Deauville extended the Global Partnership to take forward four priorities: nuclear and radiological security, biological security, scientist engagement, and implementation of UNSCR 1540 (9). These Global Partnership priorities align closely with existing UK national security objectives (2).

Global Partnership in 2013—UK Presidency

The 2013 Presidency of the G8 was held by the UK, and with it the role of Chair of the Global Partnership (10). During this time, the UK identified four priorities:

- increased Global Partnership support for projects and programmes;
- strengthening responsible science and information security;
- an expanded membership; and
- implementation of UNSCR 1540.

Activities were conducted throughout 2013 to support these priorities. The UK held the first meetings of a new Global Partnership nuclear and radiological security group. Two 'matchmaking' events were held during Global Partnership Working Group meetings, which provided Global Partnership partners and international organisations the opportunity to match funding and expertise with requests for assistance. This contributed to an increase in funded projects and programmes conducted under the Global Partnership.

The UK used its Chairmanship to highlight the importance of a strong security culture and to promote responsible science, emphasising the value of engaging scientists where issues of dual use research of concern arise. Dual-use research is conducted for legitimate purposes, but generates knowledge, technologies or products that could be used for both beneficial and harmful purposes, and becomes 'of concern' if it could present a significant threat to health, the environment or security.

Positive steps were taken under the UK's Chairmanship to expand the membership of the Global Partnership. In 2013, a number of countries were welcomed to the Partnership, including from previously under-represented regions such as Mexico and the Philippines, which joined in February and June 2013 respectively. Hungary's membership was also approved in 2013. The expanded membership brings new opportunities for the Global Partnership to improve CBRN security around the world.

The UK also invited the Coordinator of the 1540 Group of Experts, which supports implementation of UNSCR 1540, to brief the Global Partnership on their work. The UK prioritised requests for assistance to implement UNSCR 1540, and hosted meetings to match offers of funding with these assistance requests. The UK drew attention to the work of the UN's 1540 Committee and prepared an updated national report and action plan on implementation. In addition, the UK provided assistance to other states to implement UNSCR 1540 and hosted an outreach event during the June 2013 Global Partnership Working Group to support and encourage states to report on national implementation.

Global Partnership in 2014—Russian Presidency

Russia initially held the Presidency of the G8 in 2014 and hosted a meeting of the Global Partnership Working Group in St Petersburg in February. Following the suspension of Russia from the G8 in response to Russia's illegal annexation of Crimea, G7 leaders met in Brussels where they adopted a declaration on non-proliferation and disarmament (11), reaffirming their commitment to the Global Partnership. To maintain momentum, the UK hosted an ad hoc meeting of the Global Partnership's nuclear and radiological security group in July 2014, which allowed coordination of key programmes to continue and provided an opportunity to discuss assistance to Ukraine on nuclear and radiological security.

Global Partnership in 2015—German Presidency

Germany assumed the G7 Presidency and Chair of the Global Partnership, convening the annual meeting of heads of state and government at Schloss Elmau in June 2015. The first Global Partnership Working Group meeting of the German chairmanship was held in Berlin in November 2014, the second in Munich in April 2015 and the third in Berlin in September/October 2015.

1.3 Management and Oversight

Reflecting the cross-departmental nature of counter-proliferation work, the UK's CBRN security programmes are managed by a cross-Government team with the Foreign and Commonwealth Office as policy lead, the Department for Energy and Climate Change managing the nuclear and radiological portfolio and the Ministry of Defence managing biological and chemical projects. Ministers have oversight of this work through the National Security Council mechanisms.

2 Progress and achievements

2.1 Nuclear and Radiological Programmes

An attack in the UK or overseas using nuclear or radiological material could have devastating consequences. As well as the immediate devastation, a wide area potentially expanding across international borders could become contaminated and remain so for many years. The economic cost of the clean up, and the impact on world markets, would be high.

The UK's contribution to the Global Partnership in the field of radiological and nuclear security is managed by the Department of Energy and Climate Change (DECC), under their Global Threat Reduction Programme (GTRP). This programme supports the nuclear and radiological security objectives of both the UK Counter Proliferation Strategy and the Global Partnership, in cooperation with international partners. Through the successful development and delivery of the GTRP, the UK is reducing the threats posed by nuclear and radiological materials in vulnerable locations worldwide. To date, the GTRP has made contributions to improving nuclear security and safety in over 18 countries.

Upgraded physical protection at Atomflot port, Murmansk

The objectives of the GTRP are:

- to secure fissile material[1] and highly active radioactive sources to prevent their acquisition and use by terrorists;
- to embed effective security culture at all levels in nuclear and radiological enterprises globally, and ensure that countries new to civil nuclear power have the right security culture from the start;
- to prevent the spread of nuclear proliferation-related knowledge and skills to terrorists and states of concern;
- to improve border detection and security to help prevent the illicit trafficking of nuclear and radioactive material;
- to enable states to coordinate nuclear security effectively across relevant agencies; and
- to support international organisations to improve the delivery of nuclear and radiological security projects.

1 Fissile material is material that can sustain a nuclear chain reaction, i.e. material of which it is possible to assemble a critical mass. For example, the isotopes uranium-235 and plutonium-239 are fissile.

Case Study: Combating the illicit trafficking of radiological and nuclear material

There are concerns regarding the potential for illicit trafficking of radiological and nuclear material from the Former Soviet Union in the Black Sea and Central Asian regions. Over the past two years, the programme has funded a number of projects to improve radiological and nuclear detection capability in these regions.

Kazakhstan has land borders extending over 13,000 km with Russia, Uzbekistan, China, Kyrgyzstan and Turkmenistan. The UK, with the US Department of State, has been working with the Kazakh authorities to provide shelter and logistical support to the Border Guard Service of Kazakhstan. The Service is tasked with patrolling the border, over which it is possible to smuggle nuclear and radioactive materials, bypassing the proper border crossing points.

The GTRP provided eleven additional modular shelters, focusing on the border regions between Kazakhstan and Turkmenistan, Uzbekistan and the Caspian Sea. The project, at a total cost of US$3 million, covered the construction, delivery and installation of the shelters, along with the provision of power supplies and ecologically appropriate sanitary arrangements. These shelters were completed in autumn 2014, and handed over to the Border Service during a ceremony on 24 November 2014.

Shelters provided to the Border Guard Service of Kazakhstan

Alongside the US National Nuclear Security Administration, the GTRP has supported the provision of Mobile Detection System vans and supporting equipment to the Moldovan authorities, radiological and nuclear detection capabilities in Ukraine, and a mobile radiological and nuclear detection capability to the Ukrainian Border Guard. Additionally, work is being carried out in partnership with Norway and Sweden to improve cross-border counter-smuggling coordination between Ukraine and Moldova, and to hold a regional counter proliferation conference in Georgia.

Over the last two years, the GTRP has refocused its efforts. In the first ten years of the programme—until 2012—work was focused on large capital projects in the Former Soviet Union, where much has been achieved in reducing vulnerable stocks of sensitive fissile material and high activity radioactive sources, as well as improving the physical security of nuclear and radiological sites. For example, the GTRP has completed bilateral projects to upgrade physical protection arrangements at seven sites within Russia. Most of this work enhanced security arrangements at sites containing research reactors utilising highly enriched uranium (HEU), along with storage for fresh and spent nuclear fuel. One project was delivered at the Atomflot port in Murmansk, which held significant quantities of radioactive material and spent nuclear fuel, and is the staging point for fresh HEU fuel bound for the Russian nuclear-powered icebreaker fleet. The Russian projects were supported by a series of workshops

Case Study: Nuclear Security Culture Programme

Over the last two years, the GTRP has developed and launched the UK Nuclear Security Culture Programme, building on work developed over the first 10 years of the programme (including the Nuclear Security Best Practice workshop, see case study below). A strong security culture is essential in delivering effective, sustainable radiological and nuclear security. Security infrastructure is only effective if it is operated by well-trained and motivated staff, maintained correctly and if management understand and impress on their organisations the importance of nuclear security across all parts of the organisation. In addition, increasing academic and technical cooperation and the ease of electronic information exchange greatly increase the risk that proliferative nuclear information or knowledge may be unwittingly or deliberately passed to non-state actors or states of concern.

The Nuclear Security Culture Programme aims to improve attitudes towards security at sites and institutions around the world that handle sensitive nuclear materials or information. The GTRP has delivered activities under this programme both bilaterally and in cooperation with others. The bilateral programme is delivered by a consortium that is led by King's College London and includes the National Nuclear Laboratory, Imperial College London and the University of Central Lancashire. These organisations provide a blend of academic, technical and regulatory experience, and the capability to design and deliver high-quality, tailored training packages to promote nuclear security culture. The first workshop was delivered in Indonesia in March 2015 at the newly established Indonesian Centre for Security Culture and Assessment. The programme will continue in 2015/16, and include work to engage leaders of nuclear institutions, scientists, technicians and engineers.

Working with the IAEA, the UK has funded a project in South Africa, using a mentoring approach to develop the capacity and capability of educators to deliver nuclear security training. The workshops involved nuclear operators, regulators and academics, who are now developing and delivering their own training. The second phase of the project is taking place in Indonesia, with the third phase due to start in the Middle East in the summer of 2015.

The GTRP works closely with the World Institute for Nuclear Security (WINS), and has supported their Academy programme, which was launched at the 2014 Nuclear Security Summit in The Hague. The GTRP supported the development of course material for three modules now available online: the Foundation Module, the Modules for Executive Managers, and the Senior Administrators & Board Directors Elective Modules. The Academy makes high-quality nuclear security training available to a global audience, and offers those working in nuclear security the opportunity to demonstrate their competence and professional capabilities by taking certified exams. This is an important contribution towards the continuing professionalisation of the nuclear security community.

A presentation at the Nuclear Security Culture Workshop in Indonesia

Nuclear Security Culture Workshop in Indonesia

The GTRP also works closely with other international partners—in particular the US State Department's Partnership for Nuclear Security. Working with Partnership for Nuclear Security, the GTRP has delivered a number of projects, including work to support the Global Nuclear Energy Infrastructure Institute (GNEII) in Abu Dhabi, workshops on nuclear security training for academics in Asia, the Middle East and North Africa, and work to improve nuclear security in South Africa.

Case Study: Alternative Technologies

Highly Enriched Uranium (HEU) and IAEA Category I and II radiological sources, which are used in a variety of civil applications, can pose proliferation risks. The GTRP has funded programmes with the aim of developing and encouraging the use of alternative technologies to reduce these risks. For example, the GTRP is working with the US National Nuclear Security Administration's Office of Radiological Security to develop and deliver a number of workshops to engage medical and industry practitioners in priority countries worldwide on alternative technologies.

The GTRP is also contributing to an Office of Radiological Security programme, in conjunction with Norway, to provide second-hand/refurbished Linear Accelerators[1] to sites in Ukraine, to use in place of Cobalt-60 sources for medical purposes. The programme also provides training in the use of Linear Accelerators to Ukrainian operators. The ultimate aim of this project is the replacement of all Cobalt-60 sources in Ukraine with Linear Accelerators. Through the removal of these highly active Cobalt-60 sources from use in Ukraine, the proliferation and radiological security risks in the country are greatly reduced.

1 A linear accelerator is a type of particle accelerator. They are capable of generating certain types of radiation without the need for a radioactive source by accelerating particles into a target material (for example tungsten).

Case Study: Secure Store for High Active Sealed Sources, Ukraine

Since 2008, the UK has been working to design and construct a secure store for spent radioactive sources in the Chernobyl Exclusion Zone. The objective of this project is to reduce the threat of illicit trafficking of these sources by providing safe and secure long-term storage for the large quantities of spent radioactive sources currently held in Ukraine. Construction of the store was completed in March 2015. The GTRP will now work with Ukrainian and international partners to ensure that the store is brought into active use as soon as possible, reducing safety and security concerns within Ukraine, and the risk of illicit trafficking in the region.

The construction of the store, which was part of a wider programme of activities, was led by the UK and co-funded by the EU. International partners such as the US, France, Germany and Sweden have all supported projects in the area of radiological source management and transportation which will contribute to the effective and sustainable use of the Store.

A glove box unit, used for radioactive source conditioning

Staff lower a source flask onto a conveyor trolley in the Receipt Hall at the storage facility

Case Study: Collaboration with the IAEA via the Nuclear Security Fund

The International Atomic Energy Agency's Nuclear Security Fund was set up in 2002 to allow IAEA members to make voluntary contributions to the Agency's nuclear security work, which is not funded out of the regular budget. The GTRP has been working with the IAEA on nuclear security projects funded via UK contributions to the Nuclear Security Fund. Between April 2013 and March 2015, the UK contributed over £9.2 million to the fund to support high priority projects. Working in collaboration with the IAEA, the GTRP has carried out physical protection upgrades at sites in a number of countries, including Tajikistan, Moldova, Georgia and Kazakhstan. These projects enhanced physical protection around sites holding substantial quantities of highly active radioactive material or spent nuclear fuel. Other projects conducted with the IAEA aim to reduce the use of fissile material, for instance a planned project to remove fuel from and decommission the 'FOTON' pulse reactor in Tashkent, Uzbekistan.

Case Study: Nuclear Security Best Practice Workshops

This successful workshop forms part of the UK Nuclear Security Culture Programme. The workshop is endorsed by the IAEA and delivered to a global audience with the aim to raise awareness of the critical importance of a strong security culture in the protection of nuclear materials. It draws on IAEA and UK best practice, and encourages delegates to discuss and share their experiences, and reflect on their local challenges from a different perspective. The workshop explains the challenges faced by nuclear facilities in terms of potential risks and security threats, and describes the practical arrangements and cultural issues that need to be addressed in order to ensure good security. The workshops are supported by the UK's Civil Nuclear Constabulary and usually include a visit to a nuclear power plant to demonstrate best practice in nuclear security.

Attendees of the Nuclear Security Best Practice Workshop visit a nuclear power plant

Case Study: Enhancing Security of Georgia Radioactive Waste Storage Facility

The Republic of Georgia has a long-term radioactive waste disposal facility, situated on the outskirts of Tbilisi. The facility was designed and operated in the Soviet era and contains a quantity of radioactive waste. However, the detailed inventory of this waste was lost following the breakup of the Soviet Union and the subsequent period of unrest in Georgia. The facility fell into a derelict state, and by the time it was introduced to the GTRP it was situated on an open hillside area with no security at all.

The GTRP worked with the Georgian regulator and the IAEA to address shortfalls at the site:

- A perimeter fence and gates was erected around the entire site.
- The site has been linked to the national power grid to provide power for future civil works at the site.
- A reliable water supply has been provided to support future civil works and decontamination and washing.

The GTRP has also worked with the Georgian authorities to establish a framework for an independent 'radioactive waste management agency', which will be responsible for operating the waste facility. The GTRP is ready to provide appropriate support when the proposed agency is established.

that introduced project site operators and managers to UK best practice in delivering nuclear security.

As that work in the Former Soviet Union has come to a close, the focus of the GTRP is shifting to new areas, in line with the refreshed Global Partnership priorities agreed at the 2011 Deauville Summit and the UK's Counter Proliferation Strategy.

The physical protection of nuclear and radiological materials and the prevention of their illicit trafficking remains a priority for the GTRP. In addition, the programme has an increased focus on promoting a strong nuclear security culture, and the geographical reach of the programme has expanded beyond the Former Soviet Union. The GTRP delivers projects both bilaterally and in collaboration with others, such as the USA and Sweden, as well as international organisations such as the International Atomic Energy Agency (IAEA, see Case Study, page 8).

Working with the US Department of Energy National Nuclear Security Administration under a Memorandum of Understanding, a number of projects have been supported to secure nuclear material in Indonesia, Vietnam, Uzbekistan, Kazakhstan and the Philippines. Projects have also secured radioactive sources in hospitals, storage facilities and industrial facilities in countries such as Nepal, Bangladesh, Sri Lanka, Kazakhstan, Georgia, Uzbekistan and Tajikistan. In addition to securing nuclear material and highly active sources, projects have addressed border security issues in Kazakhstan and Ukraine, funded efforts to search for and secure radioactive sources which have fallen outside regulatory control (orphan sources), and provided specialised transport capacity to move sources safely and securely by road.

The GTRP also has in place a Memorandum of Understanding with the US Department of State, and a Contribution Arrangement with INTERPOL to support its Operation Fail Safe programme to help counter attempts to illicitly traffic nuclear or radiological material.

2.2 Biological and Chemical Programmes

Significant outbreaks of disease in humans caused by infectious organisms or toxins are amongst the highest impact risks faced by the UK. At their most extreme, outbreaks could cause thousands of fatalities and inflict massive economic damage. This is true regardless of whether the outbreak is the result of natural exposure, accidental release from scientific facilities or deliberate release by a state or non-state actor. Disease outbreaks in animals or plants can be equally significant, particularly in terms of economic impact. Threats from the deliberate release of biological agents by terrorists, or by another state or proxy, were recognised in the 2010 NSS as Tier One and Tier Two Priority Risks respectively.

The UK's International Biological Security Programme (IBSP) seeks to reduce these risks by improving international biosecurity and biosafety. The programme is managed by the Ministry of Defence and represents the UK's contribution to the Global Partnership in the field of biological security. The programme supports the UK's Biological Security Strategy, which provides a comprehensive approach to the range of biological threats.

Measures to address deliberate threats can also be effective in mitigating risks of a natural or accidental nature, and vice versa. Accordingly, the IBSP also contributes to elements of the Global Health Security Agenda: an initiative launched by the US in 2014 to strengthen the international community's capacity to prevent and respond to disease threats of natural, accidental or deliberate origin. The Department of Health leads for the UK in the Global Health Security Agenda, with support from the Ministry of Defence, Department for Environment, Food and Rural Affairs, Foreign and Commonwealth Office and other Departments. The IBSP contributes mainly to projects that address Global Health Security Agenda Action Package 'Prevent 3: Promoting national biosafety and biosecurity systems, and establishing biorisk management training to sustain best practice' (12).

IBSP projects also support implementation of the Biological and Toxin Weapons Convention (7) through promoting cooperation to combat infectious disease, and by improving education and promoting awareness of the Convention's objectives and the risks arising from the misuse of biological science.

The outbreak of Ebola in West Africa in 2014, and the need for a major international response, illustrated a number of key points that are relevant to the IBSP. The outbreak highlighted that risks that appear remote can quickly become immediate concerns for the UK, and that outbreaks of disease in remote areas of the world can lead to a major UK response. As of October 2015, the UK had committed £427m in international efforts against Ebola, and the Ministry of Defence had deployed a Royal Fleet Auxiliary vessel, three helicopters and a cumulative total of over 1500 troops in support. Programmes such as the IBSP strengthen capacity overseas to detect, identify and secure dangerous pathogens, and can help prevent and contain disease outbreaks of both natural and deliberate origin, and reduce the risk that they become international concerns.

The programme primarily engages in regions and countries where the following factors are present:

- a previous history of offensive biological weapons programmes or concerns;
- a continuing need to work on dangerous pathogens that are a risk to human, animal or plant health;
- poor biosecurity or biosafety;
- a significant requirement for technical expertise in order to meet international standards for biosecurity and biosafety;
- a requirement to improve scientific awareness and management of the risks associated with the misuse of dangerous pathogens;
- a need for international engagement and transparency;
- weak or underdeveloped disease surveillance and reporting systems for detecting, identifying and responding to disease outbreaks; and
- a potential risk that terrorists might seek to acquire or develop biological weapons.

The IBSP focuses on Former Soviet Union states of the Caucasus and Central Asia, Ukraine, Afghanistan, and the Middle East and North Africa. It is coordinated with other programmes under the Global Partnership, in particular those of the US and Canada, as well as with international organisations such as the World Health Organisation, the World Organisation for Animal Health, and the United Nations Food and Agriculture Organisation.

A cross-Government steering group oversees the IBSP, which includes representatives from the Ministry of Defence, Department of Health, Foreign and Commonwealth Office, Cabinet Office, Department of Energy and Climate Change, Department for Environment, Food and Rural Affairs and Government Office for Science. The Defence Science and Technology Laboratory is responsible for programme management and the provision of science and technology and non-proliferation expertise. The IBSP also benefits from access to the world-class expertise of Government agencies such as Public Health England and the Animal and Plant Health Agency, Fera Science Limited, and UK universities such as the London School of Hygiene and Tropical Medicine and the University of Bradford.

Case Study: Strengthening biological security and safety in Tajikistan

The IBSP sponsored collaborative research projects in Tajikistan during 2013–15. Tajikistan is in a region where several pathogens investigated for use as biological weapons are endemic (for example Yersinia pestis and Brucella species), and was formerly associated with the Soviet biological weapons programme. The projects were implemented through the International Science and Technology Centre, which was based in Moscow and has recently relocated to Astana, Kazakhstan. These projects resulted in international engagement with previously isolated institutes working on dangerous pathogens. They also promoted safer working practices and delivered improvements in laboratory safety and security, as well as improvements to diagnostic capability, surveillance and reporting within Tajikistan.

Tajikistan 1

A four-year collaborative research project strengthened basic surveillance capabilities to study key viral pathogens responsible for serious endemic diseases in Tajikistan. These included a number of highly dangerous pathogens such as Crimean-Congo haemorrhagic fever virus, often referred to as 'Asian Ebola'. Crimean-Congo haemorrhagic fever is the most common viral haemorrhagic fever worldwide with outbreak case fatality rates of 10–40%. There is no licensed vaccine available for humans. This work underpins Tajik capacity to deal with its regular outbreaks of Crimean-Congo haemorrhagic fever, and contributes to international understanding of the virus' aetiology and control. Through collaboration with Public Health England, modern molecular diagnostic techniques have been established in-country, reducing the requirement for handling highly infectious live viruses in the diagnostic laboratory.

The project also enabled Public Health England to acquire and share clinical material, as well as strains of viruses circulating in Tajikistan. In addition to supporting their public health research, this work allowed Public Health England to validate their techniques for detecting and diagnosing exotic viral diseases, including Crimean-Congo haemorrhagic fever. The assays have since been used to rapidly confirm cases of Crimean-Congo haemorrhagic fever in UK citizens returning from Afghanistan and Bulgaria in 2012 and 2014 respectively, illustrating the potential direct benefits to the UK from IBSP-funded collaborative research.

A follow-on collaborative research project, with technical expertise provided by the UK's Natural History Museum and Public Health England, commenced in November 2014. The project links the expertise and capabilities established by Tajikistan 1 with entomology expertise developed by another IBSP project that was completed in 2013/14. The overall aims of the project are to instil safe and secure working practices and to help Tajikistan develop sustainable national surveillance and diagnostic capabilities for specific viral diseases of concern. Furthermore, the project will enable validation of UK rapid diagnostic assays and help UK experts identify tick and mosquito vectors which could spread new and emerging viral diseases to the UK.

Tajikistan 2

Work was completed on a multi-year project focused on brucellosis, a disease which is endemic in Tajikistan and affects both humans and animals. Brucella species have previously been investigated as biological weapon agents by a number of states. The project, supported by the UK's Animal and Plant Health Agency, has resulted in:

- engagement with Tajik scientists and institutes, including a number previously involved in the Anti-Plague Station system and the Soviet weapons programme;
- improvements to safety and biosecurity in laboratories, hospitals and clinics;
- a more accurate understanding of the extent of brucellosis in humans and animals in Tajikistan and the presence of the pathogen in dairy products; and
- the development and strengthening of linkages between the animal and human health sectors in this area, which improves the ability to detect and respond to both deliberate releases and natural outbreaks of the disease.

The Animal and Plant Health Agency and Defence Science and Technology Laboratory are now working with Tajik scientists to develop a follow-on project. This will deliver improvements in laboratory safety and security at the key veterinary institute in Tajikistan responsible for brucellosis diagnosis, thereby enhancing biosecurity and the ability to work safely.

Case Study: Bradford Disarmament Research Centre projects

One of the key aims of the IBSP is to encourage biological scientists to work in a culture of integrity, accountability and responsibility. The IBSP funded a number of projects at the Bradford Disarmament Research Centre to support responsible biological science. Part of the University of Bradford, the Centre is internationally recognised for its research on the proliferation and control of nuclear, biological and chemical weapons. The Centre has developed educational resources in biosecurity and dual-use issues—many of which are available online—for use by life scientists and educators as material for teaching university students. The IBSP funded the Centre to develop and deliver country-specific biosecurity and bioethics material at workshops in Former Soviet Union countries. The IBSP and the Canadian Global Partnership Program are currently co-funding the Centre to develop a biosecurity textbook for use by undergraduate life scientists.

During 2013/14 and 2014/15, IBSP projects:

- improved physical security at laboratories and institutes, particularly in Former Soviet Union countries including Tajikistan, Georgia and Azerbaijan;
- improved the safety and security of work with dangerous pathogens. For example, through installing critical safety equipment, introducing laboratory techniques that reduce the need to work with live biological agents, and supporting the development of biosafety associations such as the Biosafety Association of Central Asia and the Caucasus and the Afghan Biorisk Association;
- strengthened countries' abilities to detect and identify disease outbreaks, including through introducing and providing training in modern diagnostic techniques;
- improved scientists' awareness of biological risks and their responsibilities in developing a culture of responsible science through supporting collaborative research projects and promoting educational initiatives; and
- increased the number and strength of scientific collaborations between institutes in countries such as Tajikistan, Azerbaijan and Georgia and their counterparts in the UK and elsewhere. The benefits from these collaborations include collaborative research projects that have resulted in international engagement with previously isolated institutes in these countries (formerly associated with the Soviet weapons programme and the Anti-Plague Station system), safer working practices, and demonstrable improvements in laboratory safety and security.

The IBSP supports biological security in specific areas that are not generally addressed by other international programmes. These include the security and safe use of high-consequence plant pathogens, where the UK has world-class expertise, and the programme is able to use existing relationships with UK and intergovernmental plant health organisations. The IBSP provides broader benefits to UK health security, including through first-hand knowledge of disease surveillance in different national contexts, access to new strains of biological agents of concern, and improved understanding of human, animal and plant diseases caused by these agents. These cooperative projects consequently improve the capability of the UK to respond to deliberately, accidentally and naturally occurring biological health events in the UK.

The IBSP continues to fund a small number of projects related to the destruction of chemical weapons. An analytical chemistry training course was delivered to six Iraqi chemists by experts at the Defence Science and Technology Laboratory in September 2013. The course was designed to acquaint the visiting chemists with up-to-date analytical instruments and methods for detecting chemical weapons. The IBSP also funds an annual international conference on Chemical Weapons Demilitarisation, which focuses on the scientific and technical challenges relating to the destruction of chemical weapons in accordance with the Chemical Weapons Convention. Under separate funding, the Ministry of Defence and Defence Science and Technology Laboratory played a major role in the removal and destruction of chemical weapons from Syria during 2014.

Case Study: Assessment of biological laboratories in northern Iraq

Iraq had a significant biological weapons programme and suffers continuing terrorist activity, notably involving ISIL. The potential for terrorists to gain access to material legitimately held and used by national human, animal and plant health systems, and the possible misuse of dual-use knowledge for hostile purposes, are of particular concern. There is therefore a need to work with the Iraqi authorities to reduce these risks and strengthen capacity to identify and mitigate malicious biological events.

In 2013, the IBSP funded a project to assess whether physical security measures at three biological laboratories in northern Iraq met required standards and recommend upgrades. The project was implemented by staff from the US Department of State Biological Engagement Program's contractor, Sandia National Laboratories. Sandia concluded that the work being conducted at the facilities in 2013 presented a low security risk. The review identified no immediate requirement for significant physical security upgrades and recommended that any future activities should focus on supporting existing capabilities. The project provided a more complete picture of biological laboratory security and biosafety capabilities in northern Iraq, which will ensure that any future international support for these laboratories can be accurately targeted.

Case Study: Strengthening international biosecurity through support to Intergovernmental Organisations

The IBSP supports and coordinates its work with the established biosecurity and biosafety programmes of the World Health Organisation, World Organisation for Animal Health and the Food and Agriculture Organisation of the United Nations. During 2013/14 and 2014/15, the IBSP:

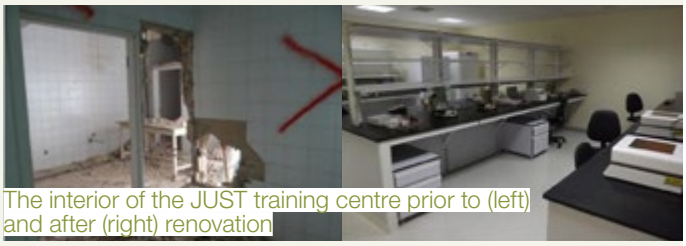
- Supported a number of security-related health activities through the World Health Organisation. These included projects to improve capacity for detecting and responding to natural and deliberate disease threats through implementation of the International Health Regulations in priority countries; training in biorisk management in the Middle East and North Africa, including Egypt and Yemen; and an international workshop addressing dual use issues of concern.
- Co-funded a post-eradication programme of the World Organisation for Animal Health and the Food and Agriculture Organisation to reduce stocks and improve global security of the rinderpest virus, which is highly pathogenic, highly communicable and potentially devastating to livestock. The sequestration and security of remaining stocks of this virus in a small number of designated holding facilities is a high priority. In May 2013, the World Organisation for Animal Health launched an IBSP-funded international media campaign to highlight the importance of the rinderpest sequestration and security programme. An IBSP-funded vaccine trial is currently underway at the UK's Pirbright Institute. If the trial is successful, the vaccine could further reduce the need to hold stocks of rinderpest virus, and potentially pave the way for their eventual elimination.

In 2013/14, a mechanism was established that enabled the IBSP to directly fund the Food and Agriculture Organisation activities to improve the security and safety of plant pathogens—an area that has been given insufficient priority in the Global Partnership. Initial IBSP-supported projects addressed a number of biological security and safety gaps in this area. Projects included the translation of key Food and Agriculture Organisation documents into Russian and Arabic to support countries to assess and manage national plant health risks. The initial projects led to a larger plant pathogen security project in the Middle East and North Africa, which is being implemented by experts from the Food and Agriculture Organisation, Fera Science Limited, and the International Plant Protection Convention's Capacity Development Committee. Using information generated under the earlier projects, this project will assess the security of regional facilities holding plant pathogen collections, provide guidance for laboratory security improvements, and assess regional plant disease surveillance and diagnostic capabilities.

Case Study: Construction of a regional biosafety training centre in Jordan

The IBSP, the US Department of Defense's Defense Threat Reduction Agency Cooperative Threat Reduction Program, the US Department of State's Biological Engagement Program and the Canadian Global Partnership Programs jointly funded the development of a regional biorisk management and molecular diagnostics training centre at the Jordan University of Science and Technology. The facility consists of a mock containment laboratory for training scientists, laboratory technicians and laboratory managers, and includes a functional heating, ventilation and air conditioning system. The training provided by the centre will contribute to laboratory safety, including by ensuring that critical heating, ventilation and air conditioning systems are properly maintained in trainees' parent laboratories.

The training centre is intended to serve as a model institution, capable of providing training to scientists in the Middle East and North Africa and South Asia regions on a variety of topics related to biorisk management, including scientists from countries such as Libya and Yemen where security conditions make access more difficult. This is currently the only dedicated training facility in the Middle East and North Africa region capable of providing biosafety training courses.



The interior of the JUST training centre prior to (left) and after (right) renovation

Staff and officials at the opening ceremony of the JUST training centre

3 Funding

Funding levels for UK Global Partnership programmes 2011–present

Financial year	MOD expenditure Biological and chemical security	DECC expenditure Nuclear and radiological security	Total expenditure
2011/12	£4.0 million	£18.5 million	£22.5 million
2012/13	£6.3 million	£13.1 million	£19.4 million
2013/14	£4.8 million	£10.4 million	£15.2 million
2014/15	£3.6 million	£10.5 million	£14.1 million

References

1. *A Strong Britain in an Age of Uncertainty: The National Security Strategy*. 2010. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61936/national-security-strategy.pdf
2. *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*. 2010. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/62482/strategic-defence-security-review.pdf
3. *National Counter Proliferation Strategy 2012-2015*. 2012. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/36194/counter-proliferation-strat.pdf
4. *CONTEST: The United Kingdom's Strategy for Countering Terrorism*. 2011. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97995/strategy-contest.pdf
5. *United Nations Security Council Resolution 1540*. 2004. http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540%20(2004)
6. T*reaty on the Non-Proliferation of Nuclear Weapons (NPT)*. http://www.un.org/disarmament/WMD/Nuclear/NPTtext.shtml
7. *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction*. http://www.unog.ch/80256EDD006B8954/(httpAssets)/C4048678A93B6934C1257188004848D0/$file/BWC-text-English.pdf
8. *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction*. http://www.opcw.org/index.php?eID=dam_frontend_push&docID=6357
9. *Deauville G8 Declaration - Renewed Commitment for Freedom and Democracy*. 2011. http://www.whitehouse.gov/sites/default/files/uploads/deauville_declaration_final_-_eng_8h.pdf
10. *Global Partnership Against the Spread of Materials and Weapons of Mass Destruction: President's Report for 2013*. 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269504/UK_2013_GP_Report.pdf
11. *G7 Declaration on Non-Proliferation and Disarmament for 2014*. 2014. http://www.consilium.europa.eu/en/press/press-releases/2014/06/pdf/G-7-Declaration-on-Non-Proliferation-and-Disarmament-for-2014/
12. *Global Health Security Agenda: Action Packages*. 2014. http://www.cdc.gov/globalhealth/security/pdf/ghsa-action-packages_24-september-2014.pdf

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