Guidelines for the Preparation and Submission of Declarations Pursuant to Article 2 of the Additional Protocol to the UK/IAEA Safeguards Agreement (INFCIRC/951/Add1)

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Table of Contents

List of Figures

List of Tables

1. Introduction

1.1. Purpose

1. The purpose of these guidelines is to assist operators with the provision of information to the Office for Nuclear Regulation (ONR) as required under the protocol additional, INFCIRC/951/Add.1 [1] to the United Kingdom (UK)/ International Atomic Energy Agency (IAEA) safeguards agreement, INFCIRC/951 [2] (hereinafter referred to as the 'additional protocol').

1.2. Background

2. Weaknesses in the International Atomic Energy Agency (IAEA) safeguards system were revealed by a number of events in the early 1990's, most notably the discovery in the aftermath of the 1991 Gulf War that Iraq had been developing a clandestine nuclear weapons programme whilst having in force a Comprehensive Safeguards Agreement (CSA), INFCIRC/153 [3] with the IAEA. The IAEA responded to these events by developing a set of measures to strengthen the effectiveness and improve the efficiency of safeguards under an initiative that became known as "programme 93+2". The main focus of the programme was to develop methods to provide the IAEA with an enhanced capability to detect undeclared nuclear activities in states with comprehensive safeguards agreements (i.e., in Non-Nuclear Weapon States (NNWS) with safeguards agreements of the kind required by the Treaty on the Non-Proliferation of nuclear weapons (NPT) [4].

3. The measures developed under programme 93+2 fell into two categories: those which the IAEA could implement under its existing legal authority and those for which new legal authority was required, i.e., the conclusion of new agreements with States (protocols additional to safeguards agreements). In May 1997, a model protocol additional, INFCIRC/540 (Corrected) [5] to safeguards agreements was approved by the IAEA board of governors.

4. Although the model protocol was developed to strengthen the IAEA's ability to detect undeclared nuclear activities in NNWS, an important issue during its negotiation was the extent of its application to states other than NNWS. Although not a requirement under the NPT, all five Nuclear Weapon States (NWS), including the United Kingdom, have concluded so-called Voluntary Offer safeguards Agreements (VOA) with the IAEA which allow the IAEA to designate certain nuclear facilities for routine safeguards inspection. Some NNWS have, nevertheless, argued that these agreements mean their nuclear industries bear a safeguards 'burden' which is not necessarily shared by comparable (and competing) industries in NWS. As a consequence, calls for broad implementation of the protocol measures in NWS (greater 'universality') were a recurrent feature of the protocol negotiations. A key factor in the agreement of the model additional protocol was the statement made by the NWS of the measures that they would implement.

5. The UK stated that it would accept those measures that would either:

   a) contribute to increasing the IAEA's capability to detect undeclared nuclear activities in the NNWS; or

   b) improve the effectiveness or efficiency of IAEA safeguards at facilities in the United Kingdom designated for inspection.

6. A further principle adopted was that where information is provided on activities at a particular location, access by IAEA inspectors to the location would also be granted.

7. Based on the above, the additional protocol was approved by the IAEA board of governors in June 1998 and signed on 22 September 1998. Legislation to provide the necessary legal powers to ensure the United Kingdom can meet the new obligations contained in the additional protocol, the Nuclear Safeguards Act 2000 (NSA) [6], received royal assent on 25 May 2000. The act was brought into force through a commencement order following entry into force of the UK additional protocol on 30 April 2004. Due to the UKs withdrawal from Euratom, a bilateral VOA entered into force on 31 December 2020 (23:00 GMT) with its additional protocol.

1.3. Article 2 of the UK Additional Protocol

8. The central components of the IAEA's strengthened and more efficient safeguards system are increased access to information and increased physical access. The basis on which the United Kingdom will provide increased information on its nuclear activities is the set of declarations described in article 2 of the additional protocol.

9. These guidelines describe the format for the preparation and submission of declarations only for those articles of the protocol for which the information must be provided to ONR, who will then compile a declaration for the UK as a whole for submission to the IAEA.

10. It should be noted that the information required pursuant to article 2 is not intended to limit the IAEA's right to information on UK nuclear facilities and their inventories of civil nuclear materials under the provisions of the UK/IAEA safeguards agreement itself. Most of the information that the United Kingdom will provide under article 2 of the additional protocol is of a kind that has not previously been sought or used routinely for safeguards purposes.

11. These guidelines and the formats for providing the information will therefore be subject to revision from time-to time as experience in their use increases. The information provided in the declaration is intended to be comprehensive but not at the cost of burdening the United Kingdom with excessive or unnecessary reporting.

12. Section 2 below will help determine whether activities carried out and other future plans are declarable under the UK additional protocol, specifically the articles 2.a.(i) and 2.b, 2.a.(iii), 2.a.(vii), 2.a.(viii) and 2.a.(ix).

13. Sections 3 and 4 below provide general guidance for preparing and submitting declarations and specific guidance for each sub-article of article 2 of the additional protocol under which information should be provided to ONR. A description of the purpose and intended use of the information, and the format for submitting the information, with examples and explanations are also provided.

1.4. Confidentiality

14. Information provided to ONR should be clearly marked with the appropriate protective security marking, and other information whose confidentiality must be maintained should also be suitably marked. The IAEA is obliged to apply a stringent regime to protect all such confidential information coming to its knowledge in accordance with the provisions of article 15 of the additional protocol. The procedures and practices of the IAEA for meeting this obligation are subject to periodic review by the IAEA board of governors, of which the United Kingdom is a permanent member. It is an offence under section 6(3) of the Nuclear Safeguards Act 2000 for ONR to disclose the information provided, except for the specific circumstances laid down in section 6(2) of the act.

1.5. Definitions

15. In the following table of definitions, some definitions are given for the purpose of the additional protocol:

Table 1: Table of definitions

Term/Acronym	Description
Export	Shipment of an equipment/good/material from the UK to any country (international destinations)
Facility	(i) A reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; Or, (ii) Any location where nuclear material in amounts greater than one effective kilogram is customarily used.
High enriched uranium	Uranium containing 20 percent or more of the isotope uranium-235.

Term/Acronym	Description
IAEA	International Atomic Energy Agency (also known as “the Agency”) It is an international organization that seeks to promote the peaceful use of nuclear energy, and to inhibit its use for any military purpose, including nuclear weapons. The IAEA was established as an autonomous organisation on 29 July 1957. It is based in Vienna (Austria)
Import	Shipment of an equipment/good/material from any country into the UK
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NWS	Nuclear Weapon State. The article 9 of the NPT defined the NWS as “a nuclear-weapon state is one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967” There are 5 NWS recognised by the NPT: United Kingdom, France, USA, Russia and China.
NNWS	Non-Nuclear Weapon State. Any other state which was not recognised by the article 9 of the NPT as a NWS.
Nuclear fuel cycle-related research and development activities	Those activities which are specifically related to any process or system development aspect of any of the following: ▪ conversion of nuclear material, ▪ enrichment of nuclear material, ▪ nuclear fuel fabrication, ▪ reactors, ▪ critical facilities, ▪ reprocessing of nuclear fuel, ▪ processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233, But **DO NOT INCLUDE** activities related to theoretical or basic scientific research or to research and development on industrial radioisotope applications, medical, hydrological and agricultural applications, health and environmental effects and improved maintenance.
Nuclear material (NM)	Any source or any special fissionable material as defined in article XX of the statute of the IAEA. The term source material shall not be interpreted as applying to ore or ore residue. Any determination by the board under article XX of the statute of the IAEA after the entry into force of this Protocol which adds to the materials considered to be source material or special fissionable material shall have effect under this protocol only upon acceptance by the United Kingdom
Operator	Generic term used throughout the guidelines to cover all declarants likely to report under article 2 of the additional protocol.

Term/Acronym	Description
ONR	Office for Nuclear Regulation. Since the entry into force of the Nuclear Safeguards (EU Exit) Regulations 2019 on 31 December 2020 (23:00 GMT), ONR is the safeguards regulator of the United Kingdom.
Source material	Article XX.3 of the statute of the IAEA defines it as “uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the board of governors shall from time to time determine; and such other material as the board of governors shall from time to time determine.”

2. Which Activities are Declarable under the UK Additional Protocol?

17. A key factor in the agreement of the UK additional protocol [1] was the statement made by the UK indicating that it would implement measures which would either:

    a) contribute to increasing the IAEA's capability to detect undeclared nuclear activities in Non-Nuclear Weapon States (NNWS); or
    b) improve the effectiveness or efficiency of IAEA safeguards at facilities in the United Kingdom designated for inspection.

18. Hence, only information relevant to satisfying these requirements needs to be provided.

19. The five following decision flowcharts provide guidance to support determination of whether activities being performed, and other future plans are declarable under the UK additional protocol, specifically the articles 2.a.(i) and 2.b, 2.a.(iii), 2.a.(vii), 2.a.(viii) and 2.a.(ix).

20. These five decision flowcharts are strictly independent and should be all fully considered as such before considering the general guidance and specific guidelines respectively in parts three and four of this document.

21. If, after consideration of the five decision flowcharts, there are activities to declare under the UK additional protocol, please fill in an ID form (see **Operators Declaration Forms per UK Additional Protocol INFCIRC/951/Add 1** [7]) in addition to the declaration form(s) under article 2.

22. In case of any change in activities, please reconsider the five decision flowcharts to re-evaluate the situation under the UK additional protocol.

23. The declarations required under articles 2.a.(iv), 2.a.(v), 2.a.(vi) will be produced from information already available within the ONR. Therefore, no decision flowchart is included for these articles. However additional information may be requested from operators if they carry out activities declared relevant to these articles.

2.1. Nuclear Fuel Cycle-Related Research and Development (R&D) Activities with a Non-Nuclear Weapon State (NNWS) – Articles 2.a.(i) and 2.b

24. The following relevant definitions are given for the purpose of the articles 2.a.(i) and 2.b

Table 2: Table of relevant definitions under the articles 2.a.(i) and 2.b

Term/Acronym	Description
Nuclear fuel cycle related R&D activities	**Those activities which are specifically related to any process or system development aspect of any of the following:** - **conversion of nuclear material,** - **enrichment of nuclear material,** - **nuclear fuel fabrication,** - **reactors,** - **critical facilities,** - **reprocessing of nuclear fuel,** - **processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233,** **But DO NOT INCLUDE activities related to theoretical or basic scientific research or to research and development on industrial radioisotope applications, medical, hydrological and agricultural applications, health and environmental effects and improved maintenance.** **Note**: The decision regarding research being theoretical or basic and the reporting obligation under article 2.a.(i) or 2.b is addressed through the answers to the two questions: a) Does the research, if successfully concluded, have direct application? b) Is the application, wholly or in part, directly related to the development of the nuclear processes or systems abovementioned as identified in article 18.a?
NNWS	Any state other than the United Kingdom, France, China, the United States, Russia.
Activities funded/specifically authorised/controlled by/carried out on behalf of the UK	Those activities which are funded directly by the UK Government, or indirectly, for example via a research council or a government owned organisation (e.g., the Nuclear Decommissioning Authority (NDA)). The authorisation may also be indirect, e.g., any relevant work conducted on an ONR licensed site would be reportable,

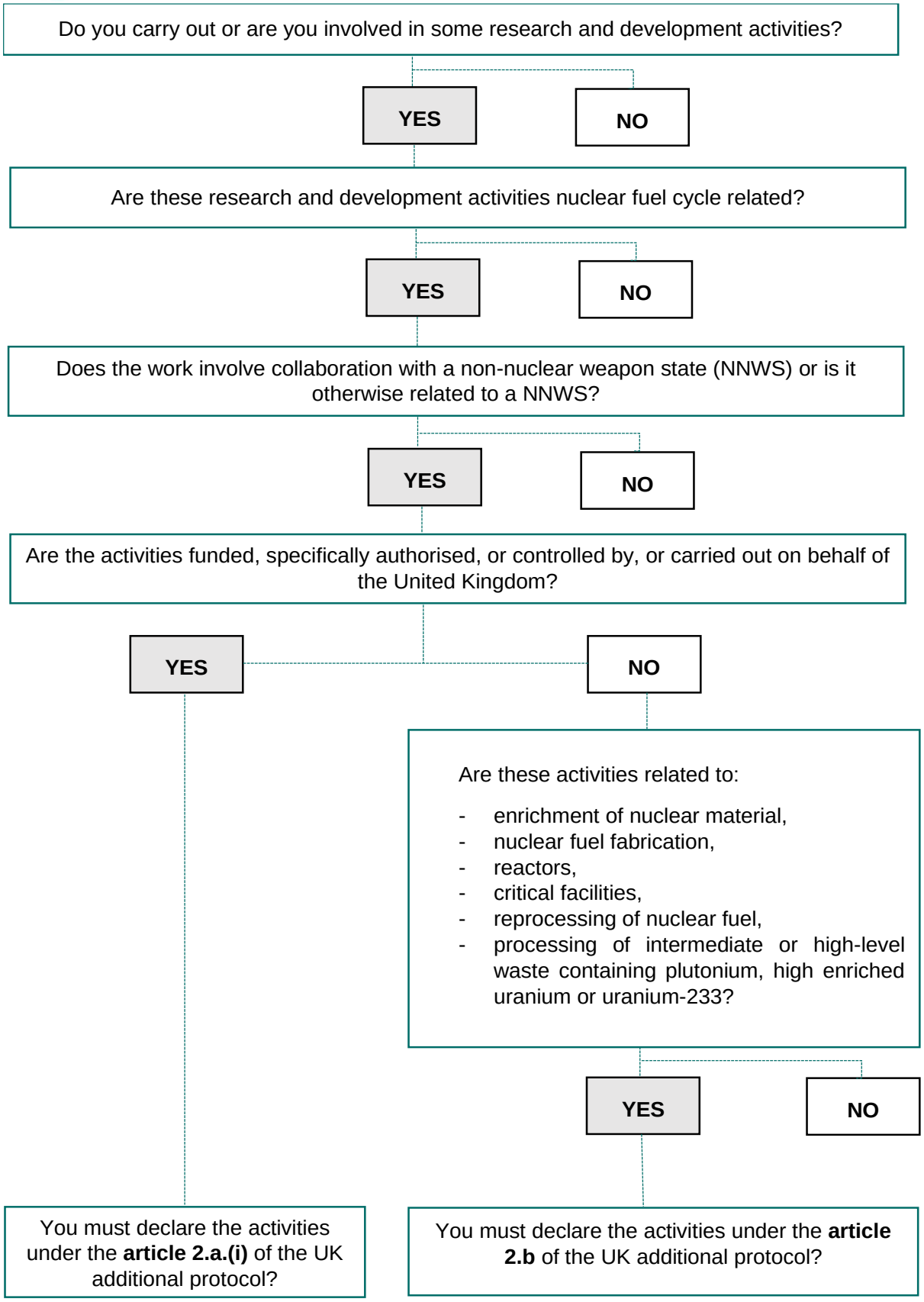

Figure 1: Process flow for determining if activities are declarable under the article 2.a.(i) or 2.b of the UK additional protocol.

2.2. General Plans for the Next Ten Years Relevant to the Development of the Civil Nuclear Fuel Cycle, Approved by the Appropriate Authorities in the UK

25. The following relevant definitions are given for the purpose of the article 2.a.(ix)

Table 3: Table of relevant definitions under the articles 2.a.(ix)

Term/Acronym	Description
Activities or plans relevant to the development of the civil nuclear fuel cycle	Those activities which by definition or by application will impact any characteristic of the civil nuclear fuel cycle (process or system) of the state, or will change the state nuclear production capacity, or will lead to developing the knowledge related to the civil nuclear fuel cycle of the state.
Nuclear fuel cycle (NFC)	The activities to be considered here are those which are specifically related to any process or system development aspect of any of the following: - mining and milling, - conversion of nuclear material, - enrichment of nuclear material, - nuclear fuel fabrication, - reactors, - critical facilities, - reprocessing of nuclear fuel, - processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233, - radioactive waste management (including disposal).
Approved by the appropriate authorities in the UK	The phrase “appropriate authorities” is intended to mean those governmental offices or governmental entities with long-range planning responsibilities for development of the nuclear fuel cycle. The declaration should include all general government and private sector plans approved by the appropriate authorities for the succeeding period. The activities that may be funded by the UK Government or an appropriate authority should also be considered.

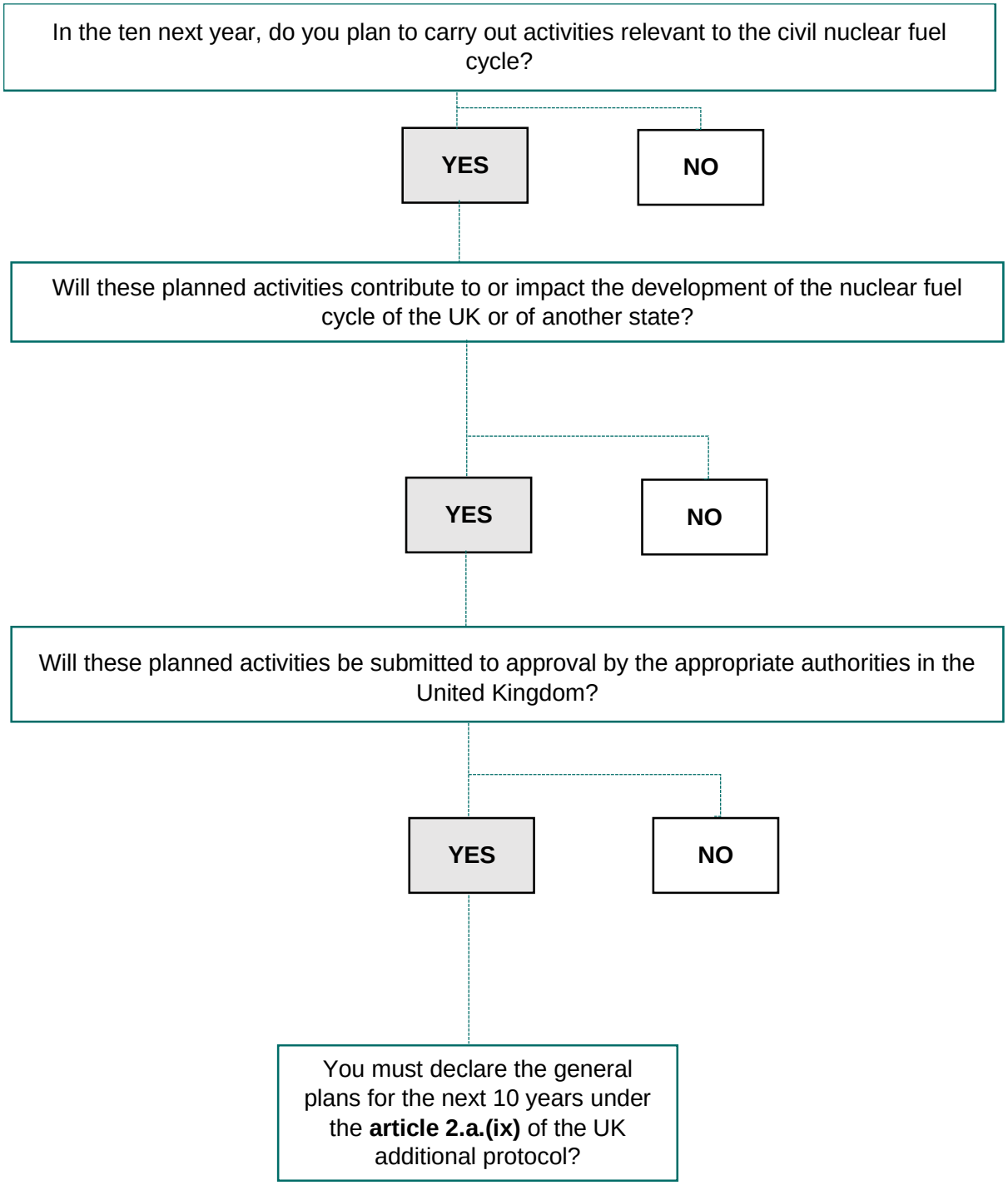

Figure 2: Process flow for determining if activities or plans are declarable under the article 2.a.(ix) of the UK additional protocol.

2.3. Nuclear Fuel Cycle Related R&D activities with a NNWS

26. The following relevant definitions are given for the purpose of the article 2.a.(iii)

Table 4: Table of relevant definitions under the articles 2.a.(iii)

Term/Acronym	Description
Activities specified in annex I	i) the manufacture of centrifuge rotor tubes or the assembly of gas centrifuges ii) the manufacture of diffusion barriers iii) the manufacture or assembly of laser-based systems iv) the manufacture or assembly of electromagnetic isotope separators v) the manufacture or assembly of columns or extraction equipment vi) the manufacture of aerodynamic separation nozzles or vortex tubes vii) the manufacture or assembly of uranium plasma generation systems viii) the manufacture of zirconium tubes ix) the manufacture or upgrading of heavy water or deuterium x) the manufacture of nuclear grade graphite xi) the manufacture of flasks for irradiated fuel xii) the manufacture of reactor control rods xiii) the manufacture of criticality safe tanks and vessels xiv) the manufacture of irradiated fuel element chopping machines xv) the construction of hot cells
NNWS	Any state other than the United Kingdom, France, China, the United States, Russia

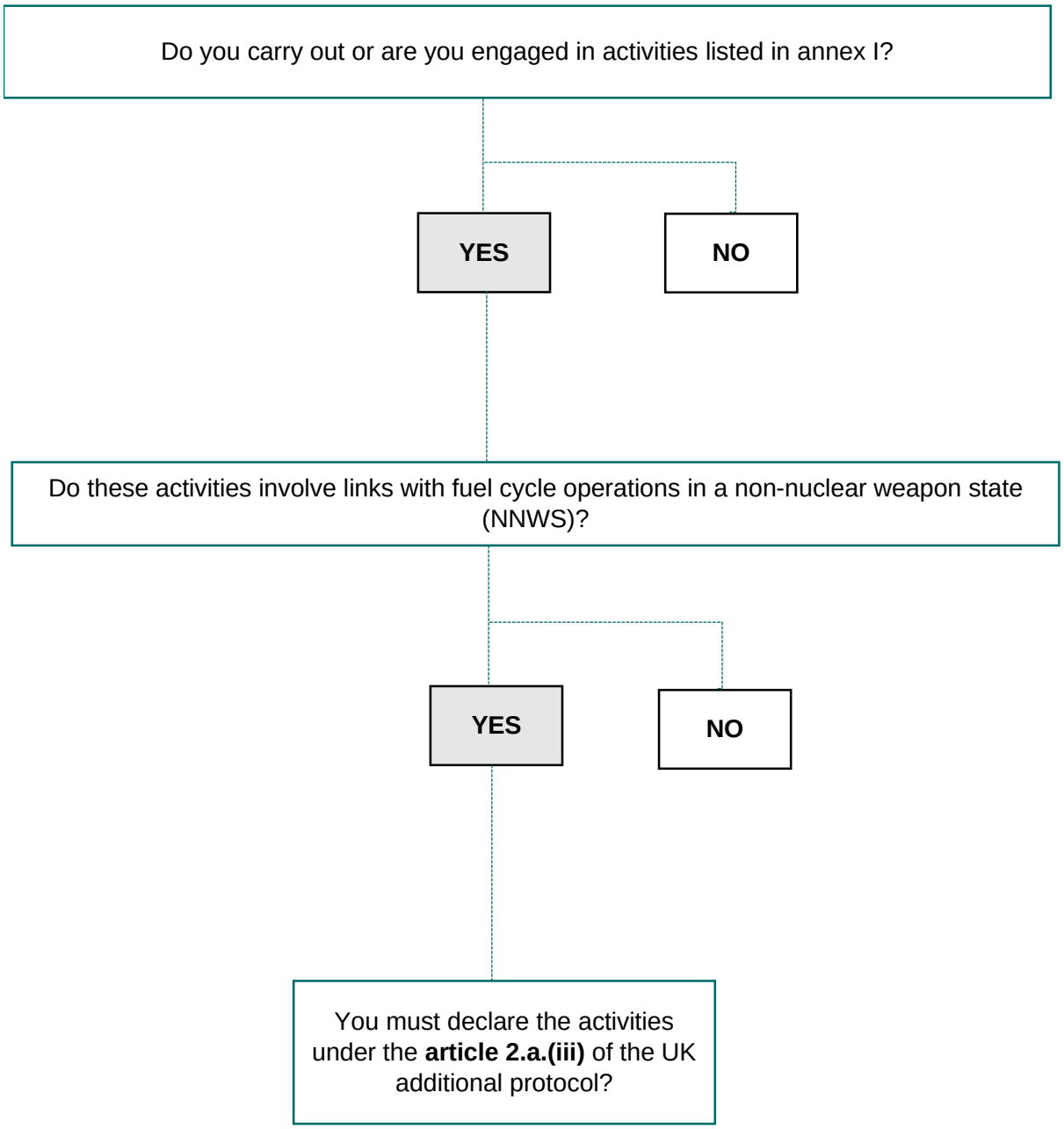

Figure 3: Process flow for determining if activities or plans are declarable under the article 2.a.(iii) of the UK additional protocol.

2.4. Terminated Intermediate and High-Level Waste Imported from or Exported to a NNWS

27. The following relevant definitions are given for the purpose of the article 2.a.(vii)

Table 5: Table of relevant definitions under the articles 2.a.(vii)

Term/Acronym	Description
NNWS	Any state other than the United Kingdom, France, China, the United States, Russia
Import	Shipment of an equipment/good/material from any country into the UK
Export	Shipment of an equipment/good/material from the UK to any country (international destinations)
High enriched uranium	Uranium containing 20 percent or more of the isotope uranium-235

28. For the purpose of the article 2.a.(vii), the waste to consider is waste which has been conditioned in such a way (for example, in glass, cement, concrete or bitumen) that it is not suitable for further nuclear use, and on which safeguards have been terminated pursuant to article 11 of the safeguard's agreements.

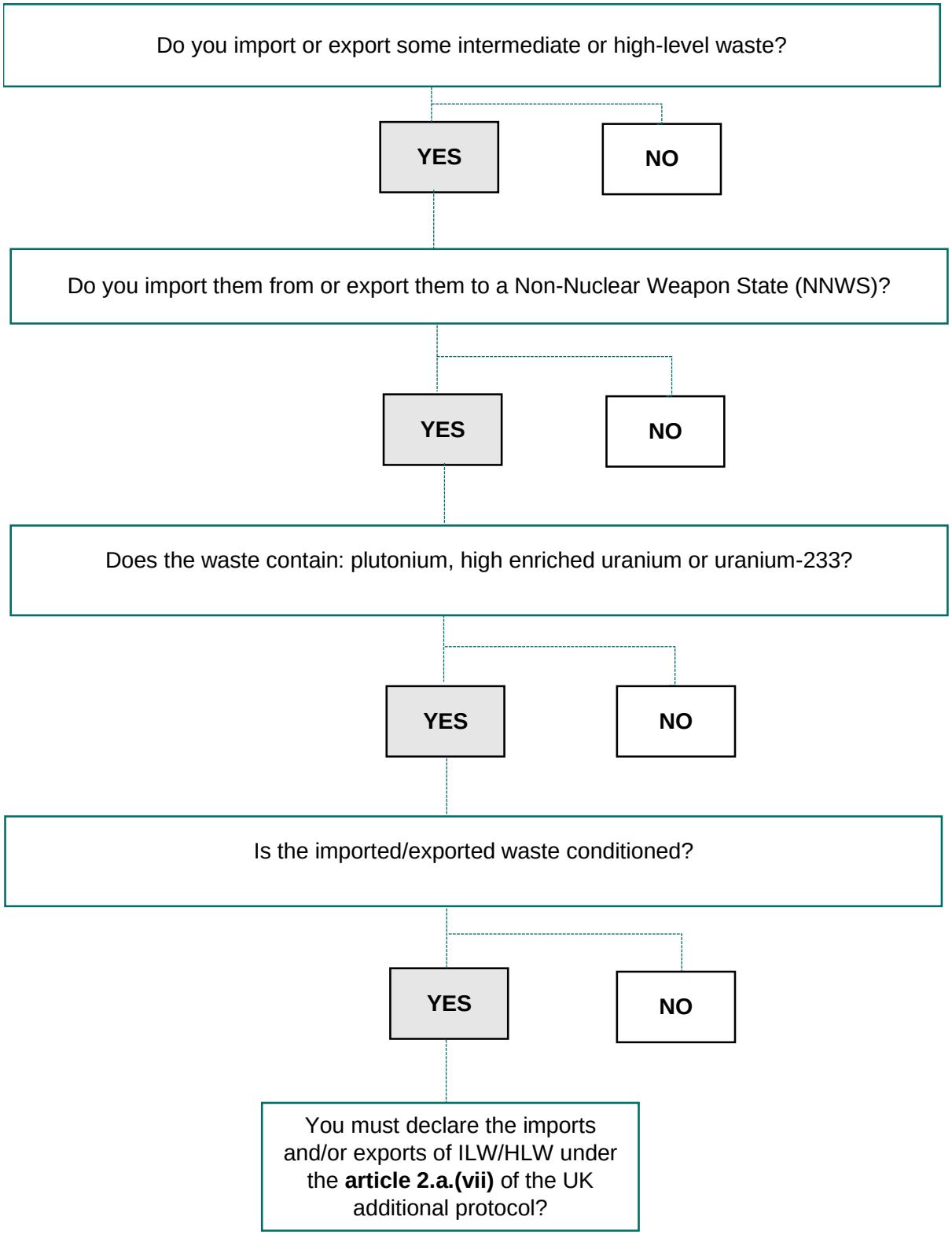

Figure 4: Process flow for determining if activities or plans are declarable under the article 2.a.(vii) of the UK additional protocol.

2.5. Export of Equipment and Non-Nuclear material to a NNWS

29. The following relevant definitions are given for the purpose of the article 2.a.(viii):

Table 6: Table of relevant definitions under the articles 2.a.(viii)

Term/Acronym	Description	
NNWS	Any state other than the United Kingdom, France, China, the United States, Russia	
Equipment and non-nuclear material specified in annex II	**Reactors and equipment therefor**: • complete nuclear reactors • reactor pressure vessels • reactor fuel charging and discharging machines • reactor control rods • reactor pressure tubes • zirconium tubes • primary coolant pumps **Non-nuclear materials for reactors**: • deuterium and heavy water • nuclear grade graphite **Plants for the reprocessing of irradiated fuel elements, and equipment especially designed or prepared therefor:** • irradiated fuel element chopping machines • dissolvers • solvent extractors and solvent extraction equipment • chemical holding or storage vessels • plutonium nitrate to oxide conversion system • plutonium oxide to metal production system **Plants for the fabrication of fuel elements.**	**Plants for the separation of isotopes of uranium and equipment, other than analytical instruments, especially designed or prepared therefor.** **Plants for the production of heavy water, deuterium and deuterium compounds and equipment especially designed or prepared therefor**: • water - hydrogen sulphide exchange towers • blowers and Compressors • ammonia-hydrogen exchange towers • tower internals and stage pumps • ammonia crackers • infrared absorption analysers • catalytic Burners **Plants for the conversion of uranium and equipment especially designed or prepared therefor**: • for the conversion of uranium ore concentrates to UO3 • for the conversion of UO3 to UF6 • for the conversion of UO3 to UO2 • for the conversion of UO2 to UF4 • for the conversion of UF4 to UF6 • for the conversion of UF4 to U metal • for the conversion of UF6 to UO2 • for the conversion of UF6 to UF4

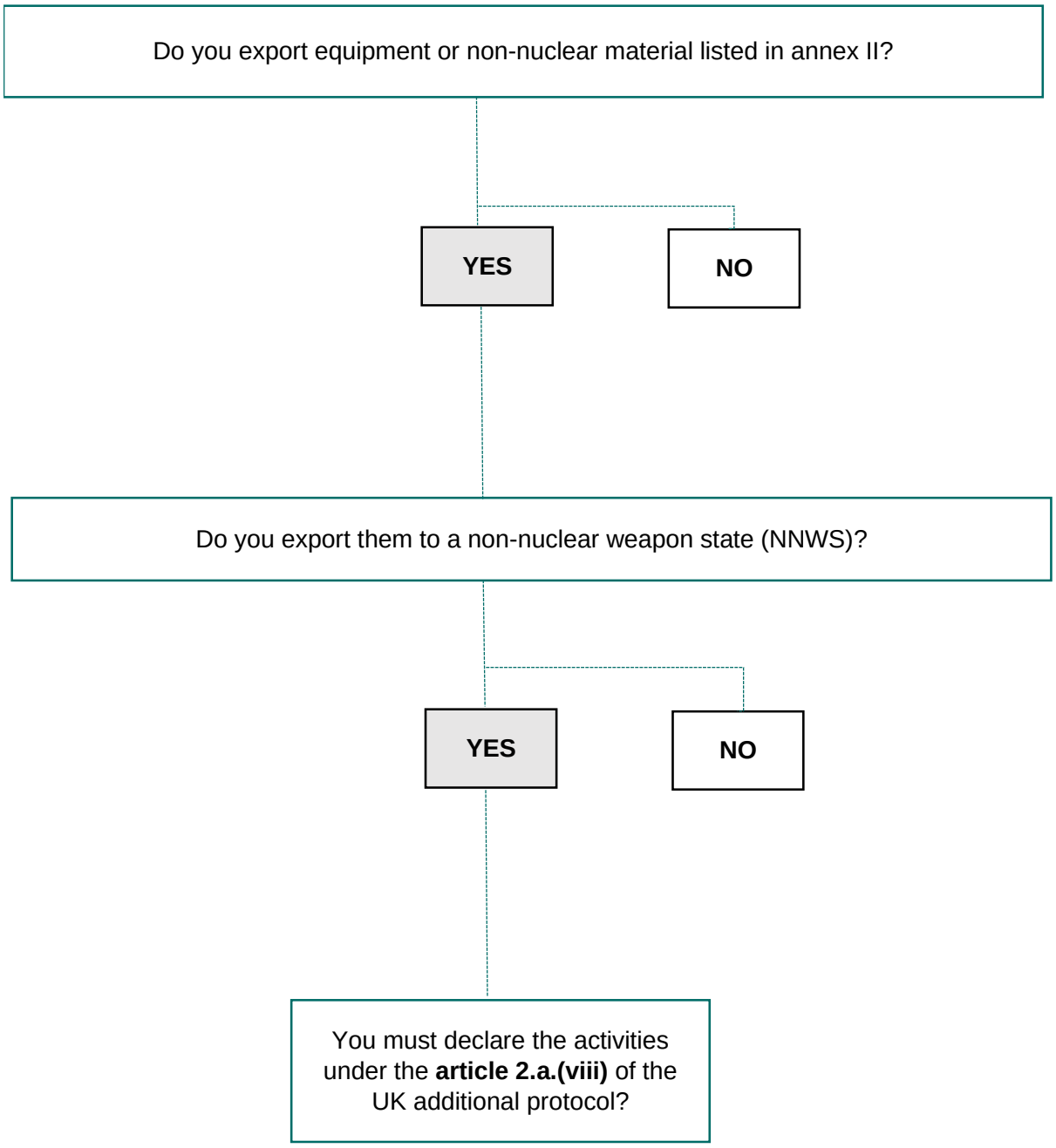

Figure 5: Process flow for determining if activities or plans are declarable under the article 2.a.(viii) of the UK additional protocol.

3. General Guidance

3.1. Declaration Types and Due Dates for Submission

31. There are three kinds of declaration:

1. **annual update and quarterly declarations** that provide a description of activities over an interval of time. In this case the appropriate entry for the declaration period is the beginning date and the end date of the time period with the understanding that the information provided is valid at the end date.

2. **advance notification** of export of Intermediate and/or high-level waste (ILW/HLW) to a NNWS. They should be provided at least 210 days before the processing/shipment takes place.

3. **clarification declarations** that provide further information to the IAEA, upon request.

Table 7: Table of types of declarations

Article	Nature of information	Declaration type		
		Annual	**Quarterly**	**Upon request as advance notification**
2.a.(i)	NFC R&D Activities with a NNWS – Authorized or controlled by government	X		
2.a.(ii)	Information identified by the IAEA on operational activities at designated facilities			X
2.a.(iii)	Scale of operations of each location – Annex I Activities	X		
2.a.(vii)	Terminated Intermediate and High-Level Waste imported from or to be exported to a NNWS	X		X
2.a.(viii)(a)	Exports to a NNWS – Specified equipment and NN-Material specified in Annex II		X	
2.a.(viii)(b)	Imports from a NNWS – Specified equipment and NN-Material specified in Annex II			X
2.a.(ix)	NFC related plans – 10-year period	X		
2.b	NFC related R&D Activities with a NNWS – NOT specifically authorized or controlled by government	X		
2.c	Amplifications and clarifications			X

32. Operators are required to provide ONR with **annual update declarations** by **end of February** every year.

33. The **quarterly declarations** required under article 2.a.(viii) should be provided within thirty days of the end of each quarter:

- Quarter one is due 30 April,
- Quarter two is due 31 July,
- Quarter three is due 31 October,
- Quarter four is due 31 January.

34. **Advance notifications** required under article 2.a.(vii) should be provided at least 210 days before the processing/shipment takes place.

35. The examples provided in the following sections provide further clarification.

3.2. General Formatting and Submission Instructions

36. Some sample formats for declarations are provided in this document, to demonstrate the expected level of detail. These examples are provided for illustrative purposes only and do not represent real declarations. Operators are also requested to submit declarations electronically to aid processing and use by ONR.

37. A separate declaration is required for each sub-article (e.g., 2.a.(i), 2.a.(iii)) and any update. ONR will complete the 'header' general information (i.e., 'name of state (or party)' to 'safeguards agreement') for each declaration. operators are requested to identify their organisation and date their declarations in the header of every declaration form they fill in. All dates should be entered as YYYY-MM-DD (e.g., 2022-10-24 for 24 October 2022).

38. The entries on each declaration should be numbered sequentially beginning with "1" on each declaration. The combination of the state (United Kingdom), the declaration number and the entry number provide a unique reference for each declaration. This reference number will be entered by ONR in the 'ref.' column in other declarations whenever it is relevant to make cross-reference to another declaration entry. In order to facilitate the use of such references, operators should advise the ONR wherever entries are related. Such advice should be provided in a covering note attached to the declaration.

39. To facilitate the annual update declaration, the information previously declared by every operator will be provided by ONR to the operator. If there has been any change in an entry since the previous declaration, the corresponding entry in the update declaration must be revised and submitted in its entirety as a new declaration entry (see the example of initial and update declarations on pages 24 and 25 respectively of these guidelines). If an entry provided previously is still valid in every respect, then an update declaration is not required. However, ONR should be advised of such entries in the note covering the declarations, or by the mention

"no change" at the end of the description of activities in the corresponding entry.

40. A note or notes should be provided separately with a declaration whenever it is considered useful to elaborate on or explain a declaration entry. Such notes should reference the additional protocol article number and declaration entry number, as appropriate. In the first instance any queries and all declarations should be addressed to:

ukso@onr.gov.uk

And/ or to:
ONR safeguards sub-division
Civil Nuclear Security and Safeguards (CNSS)
Redgrave Court
Merton Road
Bootle
Merseyside
L20 7HS

41. ONR will review all the declarations to ensure that they are self-consistent and that the requirements of the additional protocol are being met. ONR may seek clarification or amplification during the process of compiling the consolidated UK declaration. A declaration for the UK as a whole will then be submitted to the IAEA by ONR by 15 May each year.

4. Specific Guidelines

43. The following sections provide specific guidance for each individual sub-article of article 2 of the additional protocol.

4.1. Article 2.a.(i)

44. The additional protocol stipulates:

"The United Kingdom shall provide the IAEA with a declaration containing:

(i) A general description of and information specifying the location of those nuclear fuel cycle-related research and development activities carried out anywhere that are funded, specifically authorised or controlled by, or carried out on behalf of the United Kingdom, for or in co-operation with or otherwise relevant to, a non-nuclear-weapon state (hereinafter referred to as "a NNWS")."

45. Note that information should be provided on all *nuclear fuel cycle-related research and development activities*, irrespective of whether or not *nuclear material* is involved.[1]

46. The terms in italics are defined in article 18 of the additional protocol as follows:

"*Nuclear fuel cycle*-related *research and development activities* means those activities which are specifically related to any process or system development aspect of any of the following:

- conversion of nuclear material,
- enrichment of nuclear material,
- nuclear fuel fabrication,
- reactors,
- critical facilities,
- reprocessing of nuclear fuel,
- processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233,

[1] Guidance is provided in section 2 to help you determining whether or not any particular R&D project is declarable.

But **do not include** activities related to theoretical or basic scientific research or to research and development on industrial radioisotope applications, medical, hydrological and agricultural applications, health and environmental effects and improved maintenance."

"*Nuclear material* means any source, or any special fissionable material as defined in article XX of the statute. The term source material shall not be interpreted as applying to ore or ore residue. Any determination by the board under article XX of the statute of the IAEA after the entry into force of this protocol which adds to the materials considered to be source material or special fissionable material shall have effect under this protocol only upon acceptance by the United Kingdom and the community."

"*High enriched uranium* means uranium containing 20 percent or more of the isotope uranium-235."

4.1.1. Purpose and Use of the Information by the IAEA

47. Information provided under article 2.a.(i), together with that provided under article 2.b covering specified "private sector" nuclear fuel cycle-related research and development (R&D), will give the IAEA a picture as complete as possible of the R&D activities carried out in co-operation with, or otherwise relevant to a NNWS.

48. Evaluation of this information, in conjunction with other parts of the UK's declarations (e.g., under article 2.a.(iii) of the additional protocol) and information provided by the NNWS in the protocols additional to their safeguards agreements, is intended to give the IAEA the earliest possible warning of the existence of undeclared nuclear activities and nuclear material in a NNWS.

4.1.2. Explanation of Article 2.a.(i)

49. Only R&D carried out that is funded, specifically authorised or controlled by or carried out on behalf of the government that is for or in co-operation with, or otherwise relevant to, a NNWS should be reported. Please note that work funded by UKAEA, the NDA, Urenco or the European Commission is considered to be government funded or controlled.

50. The general information required in the header and the 'ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

51. For each entry, the "fuel cycle stage" column should include the relevant R&D area listed in article 18.a of the additional protocol (e.g., conversion, enrichment etc.). Single R&D projects may be relevant to more than one fuel cycle stage. When this is the case, other fuel cycle stages should be reflected in the "general description" column for that entry. When single R&D projects involve activities at more than one location, the activity at each location should be reflected in a separate entry.

52. As provided for in article 18.a of the additional protocol, the R&D activities to be reported are limited to those specifically related to a process or system development aspect of any of the seven fuel cycle areas identified.

53. For example, where they relate to a NNWS, the following types of activities must be reported:

- any R&D activities involving nuclear material or materials used for simulating nuclear material (where the R&D involves the use of nuclear material this must be stated explicitly in the general description).
- any R&D activities involving complete items of the specified equipment listed in Annex II of the additional protocol.
- computer modelling R&D activities relevant to the processes and systems defined in article 18.a of the additional protocol.
- applied research related to process development where the intended end-use is a nuclear application (e.g., design features related to criticality control and components manufactured from materials resistant to UF6 are examples of where the intended end-use is a nuclear application).

54. Theoretical and basic scientific research DO NOT have to be reported, nor R&D on industrial radioisotope applications; on medical, hydrological or agricultural applications; or on health or environmental effects. Thus, by way of example, R&D on the use of radioisotopes as tracers for improved medical diagnoses, on active neutron measurements of non-nuclear material or on development of health physics procedures for nuclear reactors need not be reported. Relevant safety-related work does however need to be reported. Reporting on waste processing is limited to intermediate or high-level waste (ILW/HLW) containing plutonium, high-enriched uranium or uranium-233 and is not required on R&D dealing with repackaging or conditioning that does not involve separation of elements.

55. ONR should be contacted for guidance if there is any doubt about whether a particular project should be reported or not.

The decision regarding research being theoretical or basic and the reporting obligation under article 2.a.(i) is best addressed through the answer to two questions:

a) Does the research, if successfully concluded, have direct application?

b) Is the application, wholly or in part, directly related to the development of the nuclear processes or systems as identified in article 18.a[2]?

[2] i.e., conversion of nuclear material, enrichment of nuclear material, nuclear fuel fabrication, reactors, critical facilities, reprocessing of nuclear fuel, processing of ILW/HLW containing Pu, enriched U or U233.

56. The “location” column should include the name of the organisation and the address where the R&D is being carried out. This is essential even if the name and address of a parent organisation is included. The address must be detailed and specific enough for the IAEA to be able to determine the geographical relationship of the location to other locations specified in this or other parts of the UK’s declarations and, should access be necessary, to provide notice of access that is unambiguous in respect of location. Where there is any uncertainty or ambiguity as to location, location co-ordinates are required in order for the IAEA to be able to locate the activity on a detailed topographic map. If the activity is located at a nuclear facility, the building number where the work is performed should be included in the “Location” column.

57. The updates to declarations under article 2.a.(i) will generally be status reports covering activities over an interval of time (e.g., the status of activities at the end of a calendar year covering activities carried out in the course of the year). Previously declared R&D that may have been stopped during the year should be reported as terminated even though the status at the end of the interval is that the project no longer exists.

58. The “general description” of each R&D activity should include:

a) the title of the R&D activity.

b) the activity’s project number or other unique designation to avoid any ambiguities in future references to the activity.

c) the relationship or connection of the state to the R&D activity (e.g., funded by NDA, a UK Government owned company).

d) identification of the organisation and location within a NNWS with which there is collaboration on the R&D activity.

e) a brief description of the work being performed, e.g., development of an active neutron technique for measuring the plutonium content of canisters of vitrified high-level waste.

f) the objectives of the specific R&D activity and the degree to which those objectives have been met at the time of the declaration (e.g., whether work toward the objective has just begun or is in the process or the objective has been met).

g) the intended nuclear application of the R&D results if this is not apparent from the objectives.

h) the timescales for the project, including the scheduled completion date.

i) a statement describing whether or not the R&D involves nuclear material, i.e., either ‘this work involves nuclear material’ or ‘this work does not involve nuclear material’. In the case of the former, a broad

indication of the amount and type of nuclear material involved should be included (e.g., gram quantities of natural uranium).

59. In addition, the IAEA should be informed via ONR, as early as possible, of the places (if any) on nuclear sites or other locations at which managed access may be applicable (article 7.b of the additional protocol). This information should be included under the "location and managed access" for each R&D activity, e.g., by using the phrase "*managed access is necessary at this location*".

4.1.3. Example declarations under article 2.a.(i)

DECLARATION FOR ARTICLE 2.a.(i)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 2
Declaration period: As of 1rst January 2021

Name of Organisation: Advanced Projects Agency
Protocol Article: 2.a.(i)
Declaration date: 2021-04-16

Entry	Reference	Fuel Cycle Stage	Location and managed access	General description
1		Enrichment of nuclear material	Advanced Projects Agency, 23 Main Avenue, R-1384 Pointsmore, England, UK Managed access is necessary at this location	Title: RAPA Isotope Separation. Project number RA-98-16. Privately funded but carried out at the APA, a government laboratory. Duration: started in 2020 for 2 years. Partners: In co-operation with the NZF, Plumtree, Atika State. Phase I is the feasibility study phase of the adaptation to uranium enrichment of the molecular method of laser isotope separation developed by the University of Rutland for stable isotopes. The objectives of Phase I are to: (1) conduct a feasibility study of the use of two commercially available laser systems; (2) develop estimates of enrichment costs; and (3) prepare design of laboratory-scale test equipment. Status: Work has just begun on objective (1) with its completion scheduled for the end of 2021. The project involves the use of gram quantities of natural uranium.
2		Processing of ILW/HLW, HEU or U233	Univ. of Rutland Engineering School, McGrath Building, 401 Macron Drive, R2257 Dembigh, Welas, UK	Studies on the effect of the prior removal of actinides (including U and Pu) on smelter design for HAW vitrification. Project number RU-98-9. Government authorised. Partners: In co-operation with SZQ, 23 East Street, Smirna, Pangea. The objectives are to: (1) determine the discharge configuration for uniform product for both alternating and simultaneous discharge modes; (2) determine the optimum operating parameters with and without the presence of certain actinides; and (3) design and test a demonstration-scale dual-discharge, high capacity glass smelter. Status: Work on objective (1) is nearly completed with completion scheduled for July 2021. Initial work under objective (2) has begun with completion scheduled for late 2023. Timescales for objective (3) will be decided after completion of objective (2). This work involves sub-gram quantities of low enriched uranium and plutonium.

Figure 6: Format of initial declaration for article 2.a.(i) with example entries[3]

[3] In the example, the number 2 was given to the 2.a(i) declaration because Advanced Projects Agency gave the number 1 to another article declaration.

DECLARATION FOR ARTICLE 2.a.(i)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 2
Declaration period: 2021-01-01 through 2021-12-31

Name of Organisation: Advanced Projects Agency
Protocol Article: 2.a.(i)
Declaration date: 2022-03-15

Entry	Reference	Fuel Cycle Stage	Location and managed access	General description
1	2-1	Enrichment of nuclear material	Advanced Projects Agency, 23 Main Avenue, R-1384 Pointsmore, England, UK Managed access is necessary at this location	Title: RAPA Isotope Separation. Project number RA-98-16. Privately funded but carried out at the APA, a government laboratory. Duration: started in 2020 for 2 years. Partners: In co-operation with the NZF, Plumtree, Atika State. Phase I is the feasibility study phase of the adaptation to uranium enrichment of the molecular method of laser isotope separation developed by the University of Rutland for stable isotopes. The objectives of Phase I are to: (1) conduct a feasibility study of the use of two commercially available laser systems; (2) develop estimates of enrichment costs; and (3) prepare design of laboratory-scale test equipment. The project involves the use of gram quantities of natural uranium Status: Work on objective (1) ended in November 2021 with publication of the 1st progress report. Phase I work (2) will begin in January 2022.
2	2-2	Processing of ILW/HLW, HEU or U233	Univ. of Rutland Engineering School, McGrath Building, 401 Macron Drive, R2257 Dembigh, Welas, UK	Studies on the effect of the prior removal of actinides (including U and Pu) on smelter design for HAW vitrification. Project number RU-98-9. Government authorised. Partners: In co-operation with SZQ, 23 East Street, Smirna, Pangea. The objectives are to: (1) determine the discharge configuration for uniform product for both alternating and simultaneous discharge modes; (2) determine the optimum operating parameters with and without the presence of certain actinides; and (3) design and test a demonstration-scale dual-discharge, high capacity glass smelter. Status: Work on objective (1) was completed in August 2021. Initial work under objective (2) is ongoing with completion scheduled for late 2023. Timescales for objective (3) will be decided after completion of objective (2). This work involves sub-gram quantities of low enriched uranium and plutonium.
3		Nuclear fuel fabrication	Advanced Projects Agency, 23 Main Avenue, R-1384 Pointsmore, England, UK Managed access is necessary at this location	Design and testing of an induction-coil nuclear fuel pellet sintering oven. Project nr RU99-11. Government funded development effort In co-operation with: Somens, 166 Auschlandstrasse, Habsburg, Flatland / Univ. of Rutland, Engineering School, McGrath Building, 401 Macron Drive, R2257 Dembigh, Wales, UK Duration: 4 years, start date September 2021 The objectives are: (1) the design of a sintering oven that meets a variety of specified temperature control requirements; and (2) the construction and demonstration testing, utilising LEU fuel pellets, of a prototype oven. Status: The work has just begun with completion of the design phase scheduled for mid-year 2022. This work involves gram quantities of low enriched uranium.

Figure 7: Format of annual update declaration for article 2.a.(i) with example entries

4.2. Article 2.a.(iii)

60. The additional protocol stipulates:

"The United Kingdom shall provide the IAEA with a declaration containing:

(iii) A description of the scale of operations for each location engaged in the activities specified in annex I to this Protocol, where these involve links with fuel cycle operations in a NNWS."

61. The activities specified in annex I are:

i) the manufacture of centrifuge rotor tubes or the assembly of gas centrifuges.

ii) the manufacture of diffusion barriers.

iii) the manufacture or assembly of laser-based systems.

iv) the manufacture or assembly of electromagnetic isotope separators.

v) the manufacture or assembly of columns or extraction equipment.

vi) the manufacture of aerodynamic separation nozzles or vortex tubes.

vii) the manufacture or assembly of uranium plasma generation systems.

viii) the manufacture of zirconium tubes.

ix) the manufacture or upgrading of heavy water or deuterium.

x) the manufacture of nuclear grade graphite.

xi) the manufacture of flasks for irradiated fuel.

xii) the manufacture of reactor control rods.

xiii) the manufacture of criticality safe tanks and vessels.

xiv) the manufacture of irradiated fuel element chopping machines.

xv) the construction of hot cells.

4.2.1. Purpose and Use of the Information by the IAEA

62. The purpose of this provision is to obtain sufficient information to provide a basis for assurances that the UK's activities involving links with NNWS in the limited but very important areas covered by annex I are consistent with the NNWS declared programme and that the NNWS capability to produce

nuclear-weapons-usable material is used only to support its declared programme.

63. The information on the scope and scale of these activities involving links with NNWS, together with the information on exports and imports of equipment and non-nuclear material provided pursuant to article 2.a.(viii), could be compared for consistency with NNWS's declared nuclear programmes. This may provide indications of where an infrastructure exists that could support nuclear activities that are not part of a NNWS declared nuclear programme. The production and assembly of this equipment and non-nuclear materials should support the declared programme and only the declared programme.

64. Article 16.b of the additional protocol provides for amendment of annex I and annex II. Proposals for amendment could result from technological developments or experience with the IAEA's "physical model" of the nuclear fuel cycle from which annex I is derived. This physical model is a major component of the IAEA's improved analysis of information and describes each nuclear activity that could be involved in the nuclear fuel cycle from source material acquisition to the production of weapons-usable nuclear material.

4.2.2. Explanation of Article 2.a.(iii)

65. Only annex I activities with links to NNWS should be reported. Contact ONR for guidance if in doubt about whether an activity should be reported.

66. The information required in the header and the 'Ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

67. A separate entry should be made for each location and each activity listed in annex I. The "annex I item" column should refer to the relevant activity listed in annex I to the additional protocol (i.e. (i) to (xv), as appropriate).

68. The "location" column should include the name of the organisation and the address where the activity is being carried out. This is essential even if the name and address of a parent organisation is included.

69. The address must be detailed and specific enough for the IAEA to be able to determine the geographical relationship of the location to other locations specified in this or other parts of the UK's declarations and, should access be necessary, to provide a notice of access that is unambiguous in respect of location. Where there is any imprecision or ambiguity as to location, location co-ordinates are required in order for the IAEA to be able to locate the activity on a detailed topographic map. If the activity is located at a nuclear facility, the building number should be included in the "location" column.

70. The “description of scale of operations” column for each location should include:

a) a brief description of the activity and its products sufficient for the IAEA to determine their relationship to the NNWS nuclear fuel cycle and programme.

b) identification of the organisation and location within a NNWS to which the activity has links.

c) an indication of the scale of operation of each existing activity listed in Annex I.

d) the places, if any, at the location where managed access may be applicable. The need for such managed access must be identified in the relevant declaration. Details regarding the proposal for managed access should be provided to ONR as soon as possible or, failing that, in the course of consultations pursuant to IAEA access.

4.2.3. Example Declarations under Article 2.a.(iii)

DECLARATION FOR ARTICLE 2.a.(iii)				
Name of State (or Party): United Kingdom **Safeguards Agreement:** INFCIRC/951 **Declaration number:** 1 **Declaration period:** As of 1rst January 2021				**Name of Organisation**: Deuterium Ltd **Protocol Article:** 2.a(iii) **Declaration date:** 2021-04-16
Entry	Ref.	Annex I Item	Location	Description of the scale of operations
1		ix) the manufacture or upgrading of heavy water or deuterium	Deuterium Ltd., 2 Wood Road, R-4227, Gironte, Sherland, UK	Heavy water production for Northern Nuclear Supplies, 34 Rue Belle, Perga, Ephesus. Production during the year was a few hundred tonnes. With minor exceptions, the heavy water produced was for nuclear use.

Figure 8: Format of initial declaration for article 2.a.(iii) with example entry

DECLARATION FOR ARTICLE 2.a.(iii)				
Name of State (or Party): United Kingdom **Safeguards Agreement:** INFCIRC/951 **Declaration number:** 1 **Declaration period:** 2021-01-01 through 2021-12-31				**Name of Organisation**: Deuterium Ltd **Protocol Article:** 2.a(iii) **Declaration date:** 2022-03-15
Entry	Ref.	Annex I Item	Location	Description of the scale of operations
1	1-1	ix) the manufacture or upgrading of heavy water or deuterium	Deuterium Ltd., 2 Wood Road, R-4227, Gironte, Sherland, UK	Heavy water production for Northern Nuclear Supplies, 34 Rue Belle, Perga, Ephesus. Production during the year was a few hundred tonnes. With minor exceptions, the heavy water produced was for nuclear use. Production capacity has been increased to 400 tonnes per year.

Figure 9: Format of annual update declaration for article 2.a.(iii) with example entry

4.3. Article 2.a.(iv)

71. The additional protocol stipulates:

> **"The United Kingdom shall provide the Agency with a declaration containing:**
>
> > **(iv) Information specifying the location and operational status of uranium mines and concentration plants and thorium concentration plants in the United Kingdom which are involved in production for a NNWS, and the current annual production of such mines and concentration plants for a NNWS. The United Kingdom shall provide, upon request by the Agency, the current annual production for a NNWS or an individual mine or concentration plant. The provision of this information does not require detailed nuclear material accountancy."**

4.3.1. Purpose and Use of the Information

72. The purpose of this article is to contribute to the completeness of the IAEA's knowledge of all of the state's holdings of nuclear material. This includes the capacity to produce source material, both in operating or closed-down mines. The information, together with information on inventories, imports and exports of nuclear material, would be used to assess the consistency of these holdings with the state's declared nuclear programme.

4.3.2. Explanation of Article 2.a.(iv)

73. The general information required in the header and the 'Ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

74. The entries in the "operation" and "status" columns should specify the element involved and the operation, e.g., "U mine and milling (concentration)," "Th concentration plant," etc., and its operational status, i.e., "operating," "temporarily closed-down," or "permanently closed-down."

75. A separate entry is required for each operation. The reporting obligation includes all mines and concentration plants regardless of their operational status. The declaration should include mining activities where uranium is, or has been, produced as a by-product. A mine that has been permanently closed should be dealt with only once, declaring it closed down and with a zero-production capacity. Locations of environmentally restored former mines could also voluntarily be declared for completeness and transparency of the declaration.

76. The "location" column should include the name of the organization and the address where the mine or plant is located. This is essential even if the name and address of a parent organization is included optionally.
The address must be detailed and specific enough for the IAEA to be able to

determine the geographical relationship of the location to other locations specified in this or other parts of the state's declarations and, should access be necessary, to provide notice of access that is unambiguous in respect of location. Where there is any imprecision or ambiguity in respect to location, geographical coordinates should be provided to permit the IAEA to be able to find the location in a map.

77. If the mine or plant is located on the site of a nuclear facility, the facility code should be included in the “location” column. A map annotated with the locations would be helpful.

78. The “estimated annual production capacity (tonnes of element: U or Th)” column should include:

a) for an individual mine and concentration plant (normally, U ore concentration plants are co-located with the mine; if not, the U ore concentration plant(s) should be described in (a) separate entry(ies)), the estimated annual production capacity stated in tonnes of element, uranium (U) or thorium (Th), as appropriate.

b) for the current annual production (actual) of the state as a whole, the tonnes of uranium and thorium that were produced during the declaration period (i.e., the most recent calendar year for initial declaration and updates).

c) for the current annual production (actual) of an individual mine or concentration plant in response to an IAEA request, the tonnes of uranium or thorium produced at the specified mine or plant during the year in question.

4.3.3. Example Declaration under Article 2.a.(iv)

DECLARATION FOR ARTICLE 2.a.(iv)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number:
Declaration period:

Name of Organisation:
Protocol Article: 2.a.(iv)
Declaration date: yyyy-mm-dd

Entry	Ref.	Operation	Status	Location	Estimated annual production capacity (tonnes of element: U or Th)	Comments

Figure 10: Format of initial and annual update declaration for article 2.a.(iv)

4.4. Article 2.a.(v)

79. The additional protocol stipulates:

"The United Kingdom shall provide the Agency with a declaration containing:

(v) Information regarding source material which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, as follows:

a) The quantities, the chemical composition and the destination of each export out of the United Kingdom to a NNWS, of such material in quantities exceeding:

1) Ten metric tons of uranium, or for successive exports of uranium from the United Kingdom to the same NNWS each of less than ten metric tons but exceeding a total of ten metric tons for the year.

2) Twenty metric tons of thorium, or for successive exports of thorium from the United Kingdom to the same NNWS each of less than twenty metric tons but exceeding a total of twenty metric tons for the year.

b) The quantities, chemical composition, current location and use or intended use of each import into the United Kingdom from a NNWS of such material in quantities exceeding:

1) Ten metric tons of uranium, or for successive imports of uranium into the United Kingdom each of less than ten metric tons but exceeding a total of ten metric tons for the year.

2) Twenty metric tons of thorium, or for successive imports of thorium into the United Kingdom each of less than twenty metric tons but exceeding a total of twenty metric tons for the year.

It being understood that there is no requirement to provide information on such material intended for a non-nuclear use once it is in its non-nuclear end-use form."

80. *Source material* is defined in article XX.3 of the statute of the IAEA as "uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the board of governors shall from time to time determine; and such other material as the board of governors shall from time to time determine."

4.4.1. Purpose and Use of the Information

81. The purpose of this article, together with the information provided under articles 2.a.(iv), 2.a.(vi) and 2.a.(vii), is to complement the information already provided through nuclear material accounting reports pursuant to the VOA (INFCIRC/951) and, thereby provide the IAEA with as complete a picture as practical of all nuclear material within the state relevant to actual or potential nuclear activities within the state. The information would be used to confirm the consistency between the state's declared nuclear programme and its holdings of nuclear material. The information on exports and imports of nuclear material for non-nuclear purposes, in conjunction with the information on exports and imports for other than non-nuclear purposes reported pursuant to INFCIRC/951, provides the IAEA with as complete a picture as is practical of the state's international transfers of nuclear material. It would be used to confirm the consistency of the exports and imports of this material with the state's declared holdings and with imports and exports declared by other states.

4.4.2. Explanations of the article 2.a(v)

82. The general information required in the header and the ‘ref’ column will be input by ONR. Guidance for the “entry” column is contained in the general guidance (section 3).

83. In part (a), a separate entry should be made for each export, for specifically non-nuclear purposes, of more than 10 tonnes of uranium or more than 20 tonnes of thorium. If, during the declaration period, multiple exports each of less than 10 tonnes of uranium but totalling more than 10 tonnes are made to the same state, each such export should be reported as a separate entry. If, during the declaration period, multiple exports each of less than 20 tonnes of thorium but totalling more than 20 tonnes are made to the same state, each such export should be reported as a separate entry.

84. In part (b), a separate entry should be made for each import, for specifically non-nuclear purposes, of more than 10 tonnes of uranium or more than 20 tonnes of thorium. If, during the declaration period, multiple imports each of less than 10 tonnes of uranium but totalling more than 10 tonnes are received, each such import should be reported as a separate entry. If, during the declaration period, multiple imports each of less than 20 tonnes of thorium but totalling more than 20 tonnes are received, each such import should be reported as a separate entry.

85. The “location” column (in part (b)) should include the name of the organization and the address where the source material is located. This is essential even if the name and address of a parent organization is included optionally. The address must be detailed and specific enough for the IAEA to be able to determine the geographical relationship of the location to other locations specified in this or other parts of the state's declarations and, should access be necessary, provide notice of access that is unambiguous in respect of location. Where there is any imprecision or ambiguity as to

location, geographic coordinates are required in order for the IAEA to be able to find the location on a map. If the location is on the site of a nuclear facility, the facility code should be included in the “location” entry, and the article 2.a.(iii) declaration and entry number for the building housing the material should be entered in the “ref.” column.

86. In part (a), the “destination” column should include the name of the state to which the export was made. Any interim destination state(s) should be entered in the “interim destination” column.

87. The entry in the “chemical composition” column should include the chemical composition of the source material, e.g., U3O8, or ThO2.

88. The entry in the “quantity” column should include the element weight in tonnes.

89. In part (a), the date the export took place should be entered in the “export date” column.

90. In part (b), the state which exported the material should be entered in the “exporting state” column.

91. In part (b), the entry in the “use (Intended)” column should include only the particular use, without the NN code, since only imports for non-nuclear use are to be reported under the additional protocol.

92. In part (b), the date the material arrived in the state should be entered in the “import date” column.

93. There is no requirement to include material in this declaration once it is in its non-nuclear end-use form.

4.4.3. Example declarations under article 2.a.(v)

DECLARATION FOR ARTICLE 2.a.(v)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number:
Declaration period:

Name of Organisation:
Protocol Article: 2.a.(v)
Declaration date: yyyy-mm-dd

Part (a) Exports

Entry	Ref.	Destination	Interim destination	Chemical Composition	Quantity (tonnes of element U or	Export date	Comments

DECLARATION FOR ARTICLE 2.a.(v)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number:
Declaration period:

Name of Organisation:
Protocol Article: 2.a.(v)
Declaration date: yyyy-mm-dd

Part (b) Imports

Entry	Ref.	Location	Chemical Composition	Quantity (tonnes of element U or Th)	Use (intended)	Exporting State	Import date	Comments

Figure 11: Format of annual update declaration for article 2.a.(v)

4.5. Article 2.a.(vi)

94. The additional protocol stipulates:

"The United Kingdom shall provide the IAEA with a declaration containing:

(vi) (a) Information regarding the quantities, uses and locations of nuclear material exempted from safeguards pursuant to article 36 of the safeguards agreement which is processed or used for a NNWS.

(b) Information regarding the quantities (which may be in the form of estimates) and uses at each location, of nuclear material exempted from safeguards pursuant to article 35(b) of the safeguards agreement but not yet in a non-nuclear end-use form, in quantities exceeding those set out in article 36 of the safeguards agreement which is processed or used for a NNWS."

95. The provision of this information does not require detailed nuclear material accountancy.

96. Information under this article will be produced from that already available within the ONR. However, additional information may be requested from operators.

4.6. Article 2.a.(vii)

97. The additional protocol stipulates:

> **"The United Kingdom shall provide the IAEA with a declaration containing:**
>
> **(vii) Information regarding the location or further processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233 on which safeguards have been terminated pursuant to article 11 of the safeguards agreement which has been imported from or is to be exported to a NNWS.**
>
> **For the purpose of this paragraph, "further processing" does not include repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal."**

4.6.1. Purpose of use of the information by the IAEA

98. The purpose of this sub-article is to complement information already provided by NNWS through accounting reports pursuant to paragraphs 59-65 and 67 of INFCIRC/153 and, thereby provide the IAEA with as complete a picture as practical of all nuclear material within the NNWS relevant to actual or potential nuclear activities within the NNWS. The information is used by the IAEA to confirm the consistency between the NNWS's declared nuclear programme and its holdings of nuclear material.

99. Although this sub-article is currently expected to apply only to relatively small amounts of nuclear material, it is nonetheless important because it deals with plutonium, high enriched uranium and uranium-233.

4.6.2. Declaration submission times

100. Information on the plans for further processing of waste as specified in article 2.a.(vii) should be dispatched to the IAEA no later than 180 days before the processing takes place. To enable ONR to meet this deadline, information about such processing or shipments should be provided as soon as possible and at least **210 days in advance of the proposed processing date**. An article 2.a.(vii) part (b) "*further processing notice*" declaration form should be submitted (see example hereafter).

101. Information on changes in the location of waste should be provided retrospectively as part of **the annual declaration**. An article 2.a.(vii) part (a) "*changes in location*" declaration form should be submitted (see example hereafter).

102. Additionally, it is ONR intention to go beyond the reporting requirements of the additional protocol and, as a separate exercise, provide the IAEA with **information in advance of exports of ILW/HLW to NNWS**. An article

2.a.(vii) part (b) "a*dvance notification of export of ILW/HLW*" declaration form should be submitted (see example hereafter).

103. Please contact ONR if such exports are anticipated. The intention is to inform the IAEA at least 180 days before the shipment takes place. To enable ONR to meet this deadline, information about such processing or shipments should be provided as soon as possible and at least **210 days in advance of the proposed shipment** date.

4.6.3. Explanations of article 2.a.(vii)

104. Only information regarding the location or further processing of waste which has been imported from or is to be exported to a NNWS should be reported.

105. The general information required in the header and the 'ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

106. Part (a) is an annual report to declare any changes in location of wastes covered by article 2.a.(vii) that occurred during the preceding calendar year. A separate entry is required for each change of location during the year.

107. Part (b) notice of this declaration is used only for advance notice of further processing of waste. Any subsequent change in processing dates or processing location should be notified to the IAEA via ONR.

In part (b) a separate entry is made for each campaign of further processing other than "repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal".

108. ONR must notify the IAEA the exports of intermediate or high-level waste to NNWS at least 180 days before the shipment takes place. This would comprise a report similar to the following example 2.a.(vii).part (b) declaration. Please contact ONR as soon as possible (and at least 210 days in advance of the proposed shipment date) if any such exports are anticipated.

109. The "waste type prior to conditioning" column should state the type of waste before any conditioning took place e.g., hulls, feed clarification sludge, high active liquid or intermediate active liquid, and the name and address of the company in the NNWS to which the entry relates.

110. The "conditioned form" column should show the current conditioned form of the waste, e.g., glass, ceramic, cement or bitumen.

111. The "number of items" column should show the number of items e.g., glass canisters or cement blocks to be involved in a single processing campaign or the number of items moved during the year from the same originating ("previous") location to the same new location.

112. The “quantity” column should include the total number of grams of plutonium, high enriched uranium or uranium-233 contained collectively in items in the “number of items” entry. The “quantity” column may be based on the quantity data used in the inventory change reports on the termination of safeguards, e.g., the average nuclear material quantities per item, and does not require a measurement of each item.

113. In part (a), the “previous location” column should indicate the location of the waste before the change in location and the “New Location” column should indicate the location after the change.

114. In part (b), the “location” columns should show the location of the waste at the time of the declaration and the “Processing Location” should show the location where the planned processing is to take place.

115. The location columns should include the name of the organisation and the address where the waste is located (or was located or will be processed/located). The address must be detailed and specific enough for the IAEA to be able to determine the geographical relationship of the location to other locations specified in this or other parts of the UK’s declarations and, should access be necessary, to provide a notice of access that is unambiguous in respect of location. Where there is any imprecision or ambiguity as to location, location co-ordinates are required in order for the IAEA to be able to find the location on a detailed topographic map. If a location is at a nuclear facility the building number should be included in the location columns.

116. In part (b), the “processing dates” column should indicate the dates the further processing campaign is expected to begin and to end.

117. In part (b), the “processing purpose” column should indicate the intended result of the processing e.g., recovery of plutonium or separation of specified fission products (note: processing to recover plutonium will require ‘full’ safeguards reporting).

4.6.4. Example Declarations under Article 2.a.(vii)

DECLARATION FOR ARTICLE 2.a.(vii)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 3
Declaration period: 2021-01-01 through 2021-12-31

Name of Organisation: Wastore Ltd
Protocol Article: 2.a.(vii)
Declaration date: 2022-03-15

Part (a) - Changes in location

					Quantity				
Entry	Ref.	Waste Type Prior to Conditioning	Conditioned form	Number of Items	Pu	HEU	U-233	Previous Location	New Location
1	6-1	high active liquid (from reprocessing of fuel from SZQ)	glass	150 drums	1 kg			QVD facility Building RR-14	SZQ storage facility, Aomori City, Pangea. Waste departed UK aboard Argoserentatitis 2000-06-24 and arrived in Pangea 2000-07-31.
2		hulls (imported from: SZQ, 23 East Street, Smirna, Pangea)	cement blocks	15 blocks	540 g	800 g		QVD facility Building RR-16	United Kingdom Waste Storage Facility, 700 Highway 13, Far Away, Nivana, UK

Figure 12: Format of annual declaration for article 2.a.(vii) part (a) - Changes in location

DECLARATION FOR ARTICLE 2.a.(vii)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 3
Declaration period: 2021-01-01 Through 2021-12-31

Name of Organisation: Wastore Ltd
Protocol Article: 2.a.(vii)
Declaration date: 2022-03-15

Part (b) - Further processing notice

					Quantity						
Entry	Ref.	Waste Type Prior to Conditioning	Conditioned form	Number of Items	Pu	HEU	U-233	Location	Processing Location	Processing Dates	Processing purposes
3		high active liquid (from reprocessing of fuel from SZQ, 23 East Street, Smirna, Pangea)	glass	46 drums	920 g			QVD facility, Bldg. RR-11	QVD facility, Bldg. RR12	2022-10-01 to 2022-12-31	Pu recovery

Figure 13: Format of notice for article 2.a(vii) part (b) - Further processing of ILW/HLW

DECLARATION FOR ARTICLE 2.a.(vii)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 10
Declaration period: As of 2021-04-15

Name of Organisation: Wastore Ltd
Protocol Article: 2.a.(vii)
Declaration date: 2021-04-15

Part (b) - Advance notification of export of ILW/HLW

					Quantity						
Entry	Ref.	Waste Type Prior to Conditionin	Conditioned form	Number of Items	Pu	HEU	U-233	Current Location	Final destination of Export	Shipment dates	Purpose
1		high active liquid (from reprocessing of fuel from SZQ, 23 East Street, Smyrna, Pangea)	glass	200 drums	1.5 kg			QVD facility, Bldg. RR-11	SZQ, 23 East Street, Smyrna, Pangea	2021-11-30 (planned)	Return of HLW to Pangea

Figure 14: Format of advance notification for article 2.a.(vii) part (b) - Export of ILW/HLW

4.7. Article 2.a.(viii)

118. The additional protocol stipulates:

"The United Kingdom shall provide the IAEA with a declaration containing:

(viii) The following information regarding specified equipment and non-nuclear material listed in annex II to the additional Protocol:

a) For each export out of the United Kingdom to a NNWS of such equipment and material: the identity, quantity, location of intended use in the receiving state and date or, as appropriate, expected date, of export.

b) Upon specific request by the Agency, confirmation by the United Kingdom, as importing state, of information provided to the Agency by a NNWS concerning the export of such equipment and material to the United Kingdom."

4.7.1. Purpose and Use of the Information

119. The purpose of this article is to obtain information on the state's international transfers in the areas covered by annex II of the additional protocol. The information will contribute substantially to the transparency of the state's nuclear and nuclear-related activities and to the IAEA's understanding of these activities.

120. The information on international transfers of equipment and non-nuclear material covered by annex II will be compared by the IAEA for consistency with states declared nuclear programmes. This will provide indications of where transfers are occurring or where an infrastructure exists that could support nuclear activities that are not part of declared nuclear programmes. Should questions arise, an importing state may be asked to confirm an exporting state's declaration.

4.7.2. Explanation of Article 2.a.(viii)

121. The general information required in the header and the 'ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

122. The format provided should be used for submission of the article 2.a.(viii)(a) declaration on exports for each calendar quarter. An entry may include multiple items of the same type shipped to a single destination.

123. The "annex II paragraph number" column should indicate the full paragraph number in annex II, e.g., 5.1.1.(b) for centrifuge rotor tubes. article 16.b of the model protocol provides for amendment of annex II.

124. Proposals for amendment could result from technological developments, experience in the analysis and use of the information or further developments in perspectives regarding the proliferation sensitivity of various equipment and non-nuclear materials.

125. The “identity of specific item(s)” column should include, as appropriate, item dimensions, capacity (volume), throughput, material of construction, identification or serial numbers, key specifications of non-nuclear material, name and address of the manufacturer, and any other information that will help identify the item(s).

126. The “quantity” column, in the case of equipment, should indicate the number of the items in the shipment. In the case of exports of non-nuclear material, the entry should be the weight of the material in kilograms or tonnes, as appropriate.

127. The “location of intended use” column should indicate the name and address of the company or organization in the receiving State where the item(s) will be used.

128. For exports, the “export date” should indicate the date on which the export actually occurred or the date when the export is believed to have been made. A single date, not a range of dates, should be entered in this column. If the export cannot be characterized by a single date, an explanation should be provided in the comment’s column.

129. For imports, if the IAEA requests confirmation by the United Kingdom as importing state of the receipt of a specific export from another state, the IAEA will send the request to the importing state, providing the name of the exporting state and exporter’s details for “identity of specific item(s),” “quantity,” and “location of intended use”, requesting confirmation of the information and the actual date of import. The response to such a request should be a separate declaration following the article 2.a.(viii) format (without the “declaration period”). An entry in the “ref.” column should name the exporting state and reference the exporting state’s declaration. The entry in the “import date” column should indicate the date the item(s) was received. If the items have not been received, this should be noted with the entry “not received” in the “import date” column. Further information may be provided in an accompanying note. The state’s response to an IAEA request for confirmation of a reported export needs to be specific enough to support a request for complementary access.

4.7.3. Declaration Submission Times

130. The information on each export covered by article 2.a.(viii)(a) should be submitted at the end of every quarter to ONR within 30 days.

131. The information on each import covered by article 2.a.(viii)(b) and specifically requested by the IAEA should be dispatched by ONR within 60 days of the IAEA's request. To enable ONR to meet this deadline, information about

such import should be provided as soon as possible after notification of the request to the operator.

4.7.4. Example Declaration under Article 2.a.(viii)

DECLARATION FOR ARTICLE 2.a.(viii)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 1
Declaration period: 2021-01-01 through 2021-03-31
Name of Organisation: NucWorldWide
Protocol Article: 2.a(viii)
Declaration date: 2021-04-30

Entry	Ref.	Annex II Paragraph Number	Identity of Specific Item(s)	Quantity (number or weight)	Location of Intended Use	Export Date / Import Date	Comments
1		5.7.13	Cooper vapor laser; manufactured by NucWorldWide Inc., 27 Main Ave., R-1385 Pointsmore, UK, serial nos. LC-300291, LC-200356, LC-500992	3 items	Lasers Limited, 10 Bufort, EX-788, Dedam, Exportania	2021-01-18	
2		2.2	Nuclear grade graphite; less than 4 ppm boron equivalent; 1.63 g.cm3 density; produced by United Carbon, Inc, 44 South Place, R-2287 Centerville, UK	34 tonnes	Western Reactor Products.,401 East Columbia Street, EX-220, Carbondale, Exportania	2021-02-22	

Figure 15: Format of quarterly declaration for article 2.a.(viii) with example entries

4.8. Article 2.a.(ix)

132. The additional protocol stipulates:

"The United Kingdom shall provide the IAEA with a declaration containing:

(ix) General plans for the succeeding ten-year period relevant to the development of the civil nuclear fuel cycle (including planned nuclear fuel cycle-related research and development activities) when approved by the appropriate authorities in the United Kingdom."

4.8.1. Purpose and Use of the Information

133. Declarations of plans for development of the state's nuclear fuel cycle will assist the IAEA in its long-term planning and contribute to increased transparency and assurance that the declared present nuclear programme and nuclear fuel cycle-related R&D are generally consistent with the declared plans for future development of the fuel cycle. Information about planned nuclear R&D to support the future development of the nuclear fuel cycle will contribute to the transparency of the state's nuclear programme. The phrase "appropriate authorities" is intended to mean those governmental offices or governmental entities with long-range planning responsibilities for development of the nuclear fuel cycle. The declaration should include all general government and private sector plans approved by the appropriate authorities for the succeeding ten-year period. Declarations under this article are not to be understood as a substitute for early provision of design information.

4.8.2. Explanation of Article 2.a.(ix)

134. The general information required in the header and the 'ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

135. The "fuel cycle stage" column should indicate one of the stages identified in article 18.a, e.g., reactors, or any other part of the fuel cycle, e.g., source material recovery. In case a single plan may be relevant to more than one fuel cycle stage, other fuel cycle stages should be reflected in the "general plans for development of the nuclear fuel cycle" or "general plans for nuclear fuel cycle-related research and development activities" column for that entry.

136. The "general plans for development of the nuclear fuel cycle" column should include a brief statement of the development plans, including the intended results, any target completion dates or overall schedule for the development and the locations involved. The information should be sufficient to enable the

IAEA to understand how the development fits into the declared programme of the state and the direction that programme might be taking.

137. For developments leading to a new nuclear facility, once development has reached the point that reporting requirements are as stipulated under the early provision of design information, it should not be included in subsequent article 2.a.(ix) declarations and an update of the appropriate declaration entry should reflect this. Similarly, when other development plans reach the point of implementation and thus become reportable under another article of the protocol, the corresponding entries under article 2.a.(ix) should indicate this and not be included in subsequent article 2.a.(ix) declarations.

138. The “general plans for nuclear fuel cycle-related research and development activities” column should include a general description of each R&D plan, its overall objectives, any target date or overall schedule for the R&D and the locations involved. The information should be sufficient to enable the IAEA to understand where and how the R&D fits into the declared programme of the state and the direction that programme might be taking. If a planned R&D activity is not related to a part of the state’s current nuclear programme or to a planned fuel-cycle development (e.g., activities in conjunction with a co-operation agreement with another state), an explanation should be included.

139. The declaration should include **all developments and activities for the succeeding ten-year period** that have been approved by the appropriate authorities.

140. In relation to article 2.a(ix), the general plans will be considered even if they don’t involve cooperation with a NNWS.

4.8.3. Example Declarations under Article 2.a.(ix)

DECLARATION FOR ARTICLE 2.a.(ix)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 1
Declaration period: As of 1rst January 2021

Name of Organisation: Advanced Projects Agency
Protocol Article: 2.a(ix)
Declaration date: 2021-04-16

Entry	Ref.	Fuel Cycle Stage	General Plans for the Development of the Nuclear Fuel Cycle	General Plans for Nuclear Fuel Cycle-related Research and Development Activities
1			Uranium exploration in South Kings Province of Welas (years 2022 to 2025); development of uranium leaching mine in West Kings Province (2023-2026); cooperative thorium exploration with Exportania in their North central Landes (2003-2007).	Development and testing of in-situ leaching techniques for West Kings type deposits (2021-2024), Univ. of Rutland, Dembigh, Welas, UK
2		Enrichment of nuclear material		Laboratory-scale test and further development of the molecular method of laser isotope separation, depending on the results of the current Phase I and II of Project RA-01-12 (planned 2003 to 2006), Advanced Projects Agency, Pointsmore, UK.
3		Reactors	A multi-unit nuclear power station comprising three LWRs of approximately 1200 MW(e) each is planned in the Western part of England. Site characterization and NSSS selection activities are underway with plans to reach final decision no later than early 2022.	
4		Reactors	A second PWR 900 MW(e) is planned for the site RBA. All infrastructure is in place with construction stated to begin by the end of 2023.	

Figure 16: Format of initial declaration for article 2.a.(ix) with example entries

DECLARATION FOR ARTICLE 2.a.(ix)

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 3
Declaration period: 2021-01-01 through 2021-12-31

Name of Organisation: Advanced Projects Agency
Protocol Article: 2.a(ix)
Declaration date: 2022-03-15

Entry	Ref.	Fuel Cycle Stage	General Plans for the Development of the Nuclear Fuel Cycle	General Plans for Nuclear Fuel Cycle-related Research and Development Activities
1	1-3	Reactors	Development of a multi-unit nuclear power station. Site characterization activities are completed and Calorica, Western England has been selected. Previous plans have been downscaled to the construction of only two reactor units. An advanced BWR 1300 MW(e) has been selected as the reactor type. Construction of the first unit will begin no later than February 2025. Construction of the second unit will start one year later.	

Figure 17: Format of annual update declaration for article 2.a.(ix) with example entry

4.9. Article 2.b

141. The additional protocol stipulates:

> **"The United Kingdom shall make every reasonable effort to provide the IAEA with:**
>
> > **a general description of and information specifying the location of those nuclear fuel cycle-related research and development activities which are specifically related to enrichment, reprocessing of nuclear fuel or the processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233 that are carried out anywhere in the United Kingdom but which are not funded, specifically authorised or controlled by, or carried out on behalf of, the United Kingdom and are for or in co-operation with, or are otherwise relevant to a NNWS.**
> >
> > **For the purpose of this paragraph, "processing" of intermediate or high-level waste does not include repackaging of waste or it's conditioning not involving separation of elements, for storage or disposal".**
>
> The terms in italics are defined in article 18 of the additional protocol and provided in the definition (section 1.7).

4.9.1. Purpose and Use of the Information by the IAEA

142. Information provided under article 2.b, together with information provided under article 2.a.(i), give the IAEA an extensive picture of the R&D activities carried out in co-operation with, or otherwise relevant to, a NNWS that are relevant to the development of enrichment, reprocessing and waste treatment. Evaluation of this information, in conjunction with other parts of the UK's declarations (e.g., article 2.a.(iii)) and information provided by the NNWS in the protocols additional to their safeguards agreements, is intended to give the IAEA as early a warning as possible of the existence of undeclared nuclear activities and material in NNWS.

4.9.2. Explanations of article 2.b[4]

143. Only R&D specifically related to enrichment, reprocessing of nuclear fuel or the processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233 which is carried out in co-operation with, or is otherwise relevant to, a NNWS should be reported.

144. The general information required in the header and the 'ref' column will be input by ONR. Guidance for the "entry" column is contained in the general guidance (section 3).

[4] Guidance is provided in section 2 to help you determining whether or not any particular R&D project is declarable.

145. For each entry, the "fuel cycle stage" column should indicate one of three relevant areas of R&D, i.e., enrichment, reprocessing or processing of waste, as appropriate. When single R&D projects involve activities at more than one location, the activity at each location should be reflected in a separate entry.

146. As provided for in article 18.a of the additional protocol, the R&D activities to be reported are limited to those specifically related to a process or system development aspect of any of the three fuel-cycle areas.

147. For example, where they relate to a NNWS, the following types of activities must be reported:

- any R&D activities, relevant to the three fuel-cycle areas referred to in 1 above, involving nuclear material or materials used for simulating nuclear material (where the R&D involves the use of nuclear material this must be stated explicitly in the general description).
- any R&D activities involving complete items of the specified equipment listed in sections 3[5] and 5[6] of annex II of the additional protocol (i.e., the sections relevant to enrichment and reprocessing).
- computer modelling R&D activities relevant to the three fuel-cycle areas referred to in 1 above.
- applied research related to process development of the three fuel-cycle areas where the intended end-use is a nuclear application (e.g., design features related to criticality control and components manufactured from materials resistant to UF6 are examples of where the intended end-use is a nuclear application).

148. Theoretical and basic scientific research is not to be reported, nor is R&D on industrial radioisotope applications; on medical, hydrological or agricultural applications; or on health or environmental effects. Relevant safety-related work does however need to be reported. Thus, by way of example, R&D on the use of radioisotopes as tracers for improved medical diagnoses, on active neutron measurements of non-nuclear material or on development of health physics procedures for nuclear reactors need not be reported. Reporting on waste processing is limited to intermediate or high-level waste (ILW/HLW) containing plutonium, high-enriched uranium or uranium-233 and is not required on R&D dealing with repackaging or conditioning that does not involve separation of elements.

The decision regarding research being theoretical or basic and the reporting obligation under article 2.a.(i) is best addressed through the answer to two questions:

[5] INFCIRC/951/Add.1, annex II, section 3 – Plants for the reprocessing of irradiated fuel elements, and equipment especially designed or prepared therefor.
[6] INFCIRC/951/Add.1, annex II, section 5 – Plants for the separation of isotopes of uranium and equipment, other than analytical instruments, especially designed or prepared therefor.

(a) Does the research, if successfully concluded, have direct application?

(b) Is the application, wholly or in part, directly related to the development of the nuclear processes or systems as identified in article 18.a[7] for this article?

149. The "location" column should include the name of the organisation and the address where the R&D is being carried out. This is essential even if the name and address of a parent organisation is included optionally.
The address must be detailed and specific enough for the IAEA to be able to determine the geographical relationship of the location to other locations specified in this or other parts of the state's declarations and should access be necessary, to provide notice of access that is unambiguous in respect of location. Where there is any imprecision or ambiguity as to location, location co-ordinates are required to enable the IAEA to locate the activity on a detailed topographic map. If the activity is located at a nuclear facility, the building number where the work is performed should be included in the "location" column.

150. The updates to declarations under article 2.b will generally be status reports covering activities over an interval of time (e.g., the status of activities at the end of a calendar year covering activities carried out in the course of the year). Previously declared R&D that may have been stopped during the year would be reported as terminated even though the status at end of the interval is that the project no longer exists.

151. The "general description", of each R&D activity should include (in the order shown):

a. the title of the R&D activity.

b. the activity's project number or other unique designation to avoid any ambiguities in future references to the activity.

c. the name and address of the private organisation sponsoring the work if it is different from the organisation performing the R&D.

d. identification of the organisation and location within a NNWS with which there is collaboration on the R&D activity. If this other country is also party to an additional protocol, it, too, should report the R&D as a collaborative effort.

e. a brief description of the work being performed, e.g., development of high specific strength, high specific modules, chemically inert filamentary material and the manufacture of high-speed rotors for gas centrifuges to be used to enrich uranium.

[7] i.e., enrichment of nuclear material, reprocessing of nuclear fuel, processing of ILW/HLW containing Pu, enriched U or U233.

f. the objectives of the specific R&D activity and the degree to which those objectives have been met at the time of the declaration (e.g., whether work toward the objective has just begun or is in progress or the objective has been met).

g. the intended application of the R&D results if this is not apparent from the objectives.

h. the timescales for the project, including the scheduled completion date.

i. a statement describing whether or not the R&D involves nuclear material, i.e., either 'this work involves nuclear material' or 'this work does not involve nuclear material'. In the case of the former, a broad indication of the amount and type of nuclear material involved should be included (e.g., gram quantities of natural uranium).

152. In addition, the IAEA should be informed via ONR, as early as possible, of the places (if any) on nuclear sites or other locations at which managed access may be applicable (Article 7.b of the additional protocol). This information should be included under the "location and manage access" column for each R&D activity, e.g., by using the phrase 'managed access is necessary at this location'.

4.9.3. Example Declarations under Article 2.b

DECLARATION FOR ARTICLE 2.b

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 3
Declaration period: As of 1rst January 2021

Name of Organisation: Advanced Projects Agency
Protocol Article: 2.b
Declaration date: 2021-04-16

Entry	Reference	Fuel Cycle Stage	Location and managed access	General description
1		Enrichment of nuclear material	Central Laser Research, Inc., 67 East Drive, R-1398, Pointsmore, Nivana, UK *Managed access is required at this location.*	CSR Laser Development. Project number CSR-267. In co-operation with National Enrichment Corporation, 16 West Avenue, Smima, Pangea. Development of new laser and determination of their optimum excitation frequencies for application to atomic vapour laser isotope separation of uranium. A continuing project with feasibility assessment scheduled for the end of 2021. The work involves the use of gram quantities of natural uranium.
2		Processing of ILW/HLW, HEU or U233	Technuc Ltd 200 London Road, W5 4RE Dembigh, UK	Studies on the effect of the prior removal of actinides on the formulation of glasses for waste vitrification. Research Project number Eng-58. The research is sponsored by Western Reactor Products, 44 South Place, R-2287 Centerville, England. In cooperation with SZQ, 23 East Street, Smirna, Pangea. The objectives are to: (1) identify alternative glass formulae; and (2) test their resistance to leaching in various geological environments. Work on objective (1) was completed in October 2020. The target completion date for objective (2) is June 2021. This work does not involve nuclear material.

Figure 18: Format of initial declaration for article 2.b with example entries

DECLARATION FOR ARTICLE 2.b

Name of State (or Party): United Kingdom
Safeguards Agreement: INFCIRC/951
Declaration number: 1
Declaration period: 2021-01-01 through 2021-12-31

Name of Organisation: Advanced Projects Agency
Protocol Article: 2.b
Declaration date: 2022-03-15

Entry	Reference	Fuel Cycle Stage	Location and managed access	General description
1	3-1	Enrichment of nuclear material	Central Laser Research, Inc., 67 East Drive, R-1398, Pointsmore, Nivana, UK *Managed access is required at this location.*	CSR Laser Development. Project number CSR-267. In co-operation with National Enrichment Corporation, 16 West Avenue, Smirna, Pangea. Development of new laser and determination of their optimum excitation frequencies for application to atomic vapour laser isotope separation of uranium. A feasibility assessment was carried out in November 2021. Equipment is currently being procured to enable the practical phase of the project to commence. The work involves the use of gram quantities of natural uranium.
2	3-2	Processing of ILW/HLW, HEU or U233	Technuc Ltd 200 London Road, W5 4RE Dembigh, UK	Studies on the effect of the prior removal of actinides on the formulation of glasses for waste vitrification. Research Project number Eng-58. The research is sponsored by Western Reactor Products, 44 South Place, R-2287 Centerville, England. In cooperation with SZQ, 23 East Street, Smirna, Pangea. The objectives are to: (1) identify alternative glass formulae and (2) test their resistance to leaching in various geological environments. Work on objective (1) was completed in October 2020. Objective (2) was completed in June 2021 and this project is now terminated. This work did not involve nuclear material.
3		Reprocessing of nuclear fuel	Atomic Energy Research Ltd., Building Area 51, Becquerel Place, Saltswold, UK	Investigations into novel dissolution methods for high burn-up fuel. Project number NDM-15. In co-operation with SZQ, 23 East Street, Smirna, Pangea. The objectives are (1) to identify problems with current dissolution methods, (2) to identify possible dissolution media and (3) undertake initial scoping trials using samples from irradiated and unirradiated fuel rods, containing sub-gram quantities of low enriched uranium and plutonium. Start date November 2021. Proposed completion dates are: (1) February 2022, (2) end 2022 and (3) end-2023.

Figure 19: Format of annual update declaration for article 2.b with example entries

5. Processing and Evaluation of Information Provided

5.1. Processing and Evaluation of Information Provided

153. The information provided under the additional protocol will be processed and evaluated by the IAEA with all other relevant information available to them. Amplification or clarification of any information provided may be sought by the IAEA (article 2.c). However, there may still be inconsistencies in the information, or the IAEA may still have questions regarding the information. In such an event, the process for resolving such inconsistencies or questions would be as specified in article 4.d of the additional protocol, which is similar to the well-established consultative process under safeguards agreements for resolving discrepancies and anomalies. Normally there will be an opportunity to provide clarification before the IAEA draws any conclusions about the question or inconsistency. As is often the case with discrepancies and anomalies arising under safeguards agreements, the consultative process may resolve the matter. In any event, the IAEA must have the opportunity to confirm the explanation or clarification provided, notably through a complementary access visit.

5.2. Complementary Access and Managed Access

154. Under the terms of the additional protocol, the United Kingdom has agreed to provide the IAEA with access to all locations on which information is provided under article 2 or, in the event it should prove necessary, to any location in the United Kingdom (Article 5.c) at any time preceded by the appropriate notification by the IAEA.

155. The IAEA may request complementary access visits in order to:

a) resolve a question relating to the completeness and correctness of the information provided in declarations under article 2 of the protocol or to resolve an inconsistency relating to that information.

b) contribute to increase the IAEA's capability to detect undeclared material and activities in a NNWS.

c) increase the effectiveness of safeguards at facilities designated for inspection by the IAEA under the terms of the safeguards agreement.

d) confirm, for safeguards purposes, declaration of the decommissioned status of a facility or part thereof which was designated for IAEA inspection.

156. When implementing a complementary access, depending on the location or facility, the IAEA may carry out the following activities:

- visual observation,
- collection of environmental samples,
- utilisation of radiation detection and measurement devices,
- non-destructive measurements and sampling,
- examination of records relevant to material, of safeguards relevant production and shipping records,
- application of seals and other identifying and tamper indicating devices specified in subsidiary arrangements,
- other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the board of governors and following consultations between the IAEA and the United Kingdom.

157. At some locations identified in the article 2 declarations or at nuclear facilities, arrangements for managed IAEA access pursuant to article 7 of the additional protocol may be required in order to prevent the dissemination of proliferation sensitive information, to meet safety or physical protection requirements, or to protect proprietary or commercially sensitive information. The need for such managed access must be identified in the relevant declaration. Where there is an obvious and ongoing need for access control, the arrangements proposed for managing IAEA access to specific locations must be communicated to the IAEA, via ONR (ukso@onr.gov.uk), as soon as possible. For other locations, proposals for managed access may be provided upon receiving notice from the IAEA of the need for access. Any proposals for how access might be managed will be evaluated by the IAEA in the light of their specific objectives, therefore managed access should be agreed in advance of the opening meeting. As stipulated in article 7 of the additional protocol, the arrangements should not preclude the IAEA from “conducting the activities necessary to resolve a question relating to the correctness and completeness of the information referred to in article 2 or an inconsistency relating to that information”.

158. Advance notice of complementary access will be provided in writing to the ONR by the IAEA. In most of the cases, the period of advance notice will be at least 24 hours. The advance notice will specify the reasons for complementary access and the activities to be carried out by the IAEA during the access. Unless otherwise agreed, access will take place only during regular working hours.

159. A “site guide”, and a deputy site guide in case of their absence, should be identified by the visited organisation to act as the main contact for the complementary access by the IAEA. The site guide will be responsible for showing IAEA inspectors around the site. In addition to the site guide (and other organisation representative considered necessary, such as staff required to gain access to or provide information on activities performed in

specific buildings), IAEA inspectors may be accompanied by representatives from ONR safeguards. Where an ONR safeguards representative cannot attend the complementary access, a point of contact will be made available remotely by ONR. In this instance, the site guide should advise ONR safeguards via the point of contact of the outcome of the complementary access as soon as possible after its conclusion and follow this up with a written report of the visit to ukso@onr.gov.uk .

160. When advance notice of complementary access is received by ONR from the IAEA, ONR will inform the organisation concerned via the identified organisation contact point and check the need for managed access. ONR will inform the IAEA of the contact point of the visited organisation as identified in the ID form (see **Operators Declaration Forms per UK Additional Protocol INFCIRC/951/Add 1** [7]). The organisation should ensure that any elements of information to be accessed are available and that any other requirements for access to site have been completed (i.e., passes for the IAEA inspectors and ONR safeguards representatives).

161. The complementary access should begin with an opening meeting with the IAEA inspectors. The purpose of this meeting is to:

- confirm the purpose of the complementary access (the reason why access has been requested,
- describe the activities performed at the site to be visited,
- agree arrangements for activities to be conducted by the inspectors (e.g., the use of measurement equipment, the use of a camera, the collection of environmental samples).

162. Following the visit, a closing meeting should be held to discuss/resolve any pending issues that arise and to confirm that the IAEA objectives for the complementary access have been met.

References

[1] IAEA, “INFCIRC/951/Add.1 - Protocol additional to the Agreement between the UK of GB and NI and the IAEA for the Application of Safeguards in the UK of GB and NI in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons,” 2021. [Online]. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/754614/MS_12.2018_VOA_Protocol.pdf.

[2] IAEA, “Agreement between the UK of GB and NI and the IAEA for the Application of Safeguards in the UK of GB and NI in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons,” 2021. [Online]. Available: https://www.iaea.org/sites/default/files/publications/documents/infcircs/2021/infcirc951.pdf.

[3] IAEA, “INFCIRC/951 - The structure and content of Agreements between the Agency and States required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons,” 1972. [Online]. Available: https://www.iaea.org/sites/default/files/publications/documents/infcircs/1972/infcirc153.pdf.

[4] United Nations, “Treaty of the Non-Proliferation of Nuclear Weapons (NPT) (729 UNTS),” 1968. [Online]. Available: https://treaties.un.org/doc/Publication/UNTS/Volume%20729/volume-729-I-10485-English.pdf .

[5] IAEA, “INFCIRC/540 - Model additional protocol to the agreement(s) between states and the International Atomic Energy Agency for the application of Safeguards,” 1997. [Online]. Available: https://www.iaea.org/sites/default/files/infcirc540.pdf.

[6] HM Government, “Nuclear Safeguards Act 2000 Chapter 5,” 2000. [Online]. Available: https://www.legislation.gov.uk/ukpga/2000/5/enacted.

[7] ONR, “ONR-DOC-TEMP-332 - Operators Declaration Forms per UK Additional Protocol INFCIRC/951/Add 1,” 2022. [Online].