

May 2004

**GUIDELINES AND FORMAT  
FOR THE PREPARATION AND  
SUBMISSION OF  
DECLARATIONS PURSUANT TO  
ARTICLE 2 OF THE PROTOCOL  
ADDITIONAL TO INFCIRC/263,  
THE UK/EURATOM/IAEA  
SAFEGUARDS AGREEMENT**

Department of Trade and Industry  
UK Safeguards Office  
1st Floor  
4 Abbey Orchard Street  
London  
SW1P 2HT

## CONTENTS

	<b>PAGE</b>
<b>I. INTRODUCTION</b>	<b>3</b>
<b>Purpose</b>	<b>3</b>
<b>Background</b>	<b>3</b>
<b>Article 2 of the UK Additional Protocol</b>	<b>4</b>
<b>Confidentiality</b>	<b>5</b>
<b>Managed Access</b>	<b>5</b>
<b>Processing and Evaluation of Information Provided</b>	<b>6</b>
<b>II. GENERAL GUIDANCE</b>	<b>7</b>
<b>III. SPECIFIC GUIDELINES</b>	<b>9</b>
<b>III.1 Article 2.a.(i)</b>	<b>9</b>
<b>III.2 Article 2.a.(iii)</b>	<b>16</b>
<b>III.3 Article 2.a.(vii)</b>	<b>20</b>
<b>III.4 Article 2.a.(viii)</b>	<b>26</b>
<b>III.5 Article 2.a.(ix)</b>	<b>26</b>
<b>III.6 Article 2.b</b>	<b>26</b>

## I. INTRODUCTION

### **Purpose**

The purpose of these guidelines is to assist operators<sup>1</sup> with the provision to the UK Safeguards Office (UKSO) of information required under the Protocol Additional to the UK/Euratom/IAEA Safeguards agreement<sup>2</sup> (hereinafter referred to as the Additional Protocol).

### **Background**

Weaknesses in the International Atomic Energy Authority (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 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<sup>3</sup> (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)).

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 to comprehensive safeguards agreements<sup>4</sup> was approved by the IAEA Board of Governors.

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<sup>5</sup> (NWS), including the UK, have concluded so-called voluntary offer safeguards agreements 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

---

<sup>1</sup> The term 'operator' is used throughout this document as a generic term to cover all organisations likely to be required to report under Article 2 of the Additional Protocol.

<sup>2</sup> Miscellaneous Series No. 21 (1999) Cm 4282 (available from HM Stationery Office). Extracts relevant to declarations are contained in this document.

<sup>3</sup> These are based on the INFCIRC/153 model agreement.

<sup>4</sup> INFCIRC/540

<sup>5</sup> The five NPT recognised nuclear weapon states are: UK, USA, Russia, China and France.

of the model additional protocol was the statements made by the NWS of the measures that they would implement. 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 UK designated for inspection.

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.

On the basis of 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 UK can meet the new obligations contained in the Additional Protocol, **the Nuclear Safeguards Act 2000** (NSA), 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.

## **Article 2 of the UK Additional Protocol**

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 UK will provide increased information on its nuclear activities is the set of declarations described in Article 2 of the Additional Protocol.

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 the UKSO, who will then compile a declaration for the UK as a whole for submission to the IAEA. The information required under Articles 2.a.(iv), 2.a.(v), 2.a.(vi) and certain information under Article 2.a.(vii) of the Additional Protocol, which concern nuclear material, will be supplied to the IAEA by the European Commission (Euratom). 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 material under the provisions of the UK/Euratom/IAEA safeguards agreement<sup>6</sup> itself.

Most of the information that the UK 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. 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

---

<sup>6</sup> INFCIRC/263

declaration is intended to be comprehensive but not at the cost of burdening the UK with excessive or unnecessary reporting.

Sections II and III 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 UKSO. 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.

### **Confidentiality**

Information provided to the UKSO 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 UK is a permanent member. It is an offence under section 6(3) of the Nuclear Safeguards Act 2000 for UKSO to disclose the information provided, except for the specific circumstances laid down in section 6(2) of the Act.

### **Managed Access**

Under the terms of the Additional Protocol the UK 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 UK (Article 5.c). It is, however, considered that any IAEA requests for complementary access would most likely be to locations at nuclear facilities.

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. 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 UKSO, 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. 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”.

## **Processing and Evaluation of Information Provided**

The information provided under the Additional Protocol will be processed and evaluated with other relevant information available to the IAEA. Amplification or clarification of any information provided may be sought by the IAEA (Article 2c). 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 existing 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 existing 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.

## II. GENERAL GUIDANCE

As noted earlier, a key factor in the agreement of the model additional protocol (INFCIRC/540) was the statements made by the nuclear weapon States (NWS) of the measures that they would implement. The UK indicated 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 UK designated for inspection.

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

The sample formats for declarations are shown in hard copy form to illustrate and help explain the level of detail expected. However, operators are also requested to submit declarations electronically on a PC-compatible 3½" diskette or CD-ROM to aid processing and use by UKSO.

A separate declaration is required for each sub-article and any update. UKSO will complete the 'header' information (i.e. from 'name of State (or Party)' to 'declaration date' inclusive) for each declaration. 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 provides a unique reference for each declaration. This reference number will be entered by UKSO 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 UKSO wherever entries are related. Such advice should be provided in a covering note attached to the declaration.

There are two kinds of declaration (the UKSO will input 'header' information in both cases):

- a) initial declarations that provide the status of an activity or inventory at a point in time and the appropriate entry for such a declaration period is an "as of" date. The "as of" date for the UK Additional Protocol is 30 April 2004; or
- b) update 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. The period over which a declaration is required will be specified by UKSO - update declarations will usually cover a calendar year i.e. to cover the period 1st January - 31st December for any particular year.

Operators are required to provide the UKSO with annual update declarations by 28<sup>th</sup> February in any year. Declarations required under Article 2.a.(vii) should be provided at least 210 days **before** the processing takes place. The examples provided in the sections that follow provide further clarification.

All dates should be entered as YYYY-MM-DD, e.g., 2003-11-21 for 21 November 2003.

If there has been any change in an entry since the previous declaration, the corresponding entry in the update declaration **must** be submitted in its entirety as a new declaration entry (see the example initial and update declarations on pages 10 and 11 respectively of these guidelines). If an entry provided previously is still valid in every respect, then an update declaration is not required. However, UKSO should be advised of such entries in the note covering the declarations.

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:

Lawrence Johnson  
Department of Trade and Industry  
UK Safeguards Office  
Bay 118, 1st Floor  
4 Abbey Orchard Street  
SW1P 2HT  
tel. 020 7215 0747  
fax 020 7215 0745  
email: lawrence.johnson@dti.gsi.gov.uk

The UKSO will review all the declarations to ensure that they are self-consistent and that the requirements of the Protocol are being met. Operators will be consulted if substantial changes to the declarations need to be made. A declaration for the UK as a whole will then be submitted to the IAEA.

### III. SPECIFIC GUIDELINES

The following sections provide specific guidance for each individual sub-article of Article 2 of the Additional Protocol.

#### III.1 Article 2.a.(i)

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”).”

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.

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,

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 Agency 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.”

#### Purpose and use of the information by the IAEA

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 as complete a picture as possible of the R&D activities carried out in co-operation with, or otherwise relevant to, a NNWS.

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.

**FORMAT OF DECLARATIONS FOR ARTICLE 2.a.(i) (AN INITIAL DECLARATION WITH FICTITIOUS EXAMPLE ENTRIES)**

<b>Name of State (or Party):</b>	United Kingdom	<b>Protocol Article:</b>	2.a.(i)
<b>Safeguards Agreement:</b>	INFCIRC/263	<b>Declaration date:</b>	<i>DTI to input</i>
<b>Declaration number:</b>	1 ( <i>DTI to input</i> )		
<b>Declaration period:</b>	as of 1999-12-31		

Entry	Ref.	Fuel Cycle Stage	Location	General Description
1		Enrichment of nuclear material	Advanced Projects Agency, 23 Main Avenue, R-1384 Pointsmore, England, UK	RAPA Isotope Separation - Phase I. Project number RA-98-16. Privately funded but carried out at the APA, a government laboratory. In co-operation with the NZF, Plumtree, Atika. 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. Work has just begun on objective (1) with its completion scheduled for the end of 2001. The project involves the use of gram quantities of natural uranium. Managed access is necessary at this location.
2		Processing of waste	Univ. of Rutland Engineering School, McGrath Building, 401 Macron Drive, R-2257 Dembig, 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. 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. Work on objective (1) is nearly complete with completion scheduled for July 2000. Initial work under objective (2) has begun with completion scheduled for late 2000. Timescales for objective (3) will be decided after completion of objective (2). This work involves sub-gram quantities of low enriched uranium and plutonium.

**FORMAT OF DECLARATIONS FOR ARTICLE 2.a.(i) (THE FIRST ANNUAL UPDATE DECLARATION WITH FICTITIOUS EXAMPLE ENTRIES)**

<b>Name of State (or Party):</b>	United Kingdom	<b>Protocol Article:</b>	2.a.(i)
<b>Safeguards Agreement:</b>	INFCIRC/263	<b>Declaration date:</b>	<i>DTI to input</i>
<b>Declaration number:</b>	10 ( <i>DTI to input</i> )		
<b>Declaration period:</b>	2000-01-01 through 2000-12-31		

Entry	Ref.	Fuel Cycle Stage	Location	General Description
1	1-2	Processing of Waste	Univ. of Rutland Engineering School, McGrath Building, 401 Macron Drive, R-2257 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. 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. Work on objective (1) is complete and a report issued in August 2000. Work under objective (2) continues with completion scheduled for the second quarter of 2001. Timescales for objective (3) will be decided after completion of objective (2). This work involves sub-gram quantities of low enriched uranium and plutonium.
2		Fuel fabrication	Univ. of Rutland Engineering School, McGrath Building, 401 Macron Drive, R-2257 Dembigh, Welas, UK	Design and testing of an induction-coil nuclear fuel pellet sintering oven. Project number RU-99-11. Government funded development effort. In co-operation with Somens, 166 Auschlandstrasse, Habsburg, Flatland. 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. The work has only just begun with completion of the design phase scheduled for mid-year 2001. This work involves gram quantities of low enriched uranium.

## Explanations of Article 2.a(i)

1. 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, BNFL, Urenco or the European Commission (e.g. under the Euratom Framework Programmes) is considered to be Government funded or controlled.
2. The information required in the header and the 'Ref' column will be input by UKSO. Guidance for the "Entry" column is contained in the GENERAL GUIDANCE section.
3. 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, all relevant fuel cycle stages should be reflected in the "Fuel Cycle Stage" 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.
4. 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. 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 Protocol;
  - computer modelling R&D activities relevant to the processes and systems defined in Article 18.a of the Protocol; and
  - 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 UF<sub>6</sub> are examples of where the intended end-use is a nuclear application).

Theoretical and basic scientific research does not 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.

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

5. 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.
6. 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. The example update declaration for Article 2.a.(i) is silent with respect to entry 1 of declaration 1 (i.e., Ref. 1-1) because there is no change to report.
7. 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 relationship or connection of the State to the R&D activity, e.g., ‘funded by’, or ‘BNFL funded’;
  - 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; and
  - 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).
8. In addition, the IAEA should be informed via UKSO, 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 “General Description” for each R&D activity, e.g. by using the phrase ‘managed access is necessary at this location’.

### **III.2 Article 2.a.(iii)**

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.”

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; and
- xv) the construction of hot cells.

#### Purpose and use of the information by the IAEA

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.

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), will 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.

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.

**FORMAT OF DECLARATIONS FOR ARTICLE 2.a.(iii) (AN UPDATE OF AN INITIAL DECLARATION WITH FICTITIOUS EXAMPLE ENTRIES)**

**Name of State (or Party):** United Kingdom  
**Safeguards Agreement:** INFCIRC/263  
**Declaration number:** *DTI to input*  
**Declaration period:** 2000-01-01 through 2000-12-31

**Protocol Article:** 2.a.(iii)  
**Declaration date:** *DTI to input*

Entry	Ref.	Annex 1 Item	Location	Description of Scale of Operations
1		(iii)	Central Laser Systems plc, 27 Main Ave., R-1385, Pointsmore, Nivana, UK	Manufacture, on behalf of NZF, Plumtree, Atika, of U vaporisation systems of up to 10kW/cm <sup>2</sup> , of tantalum collector assemblies for U product and tails, and separator housings and assembly of these together with imported liquid U metal handling systems and imported frequency stabilised copper vapour and dye lasers into complete laser-based systems. Several systems of capacities up to a few hundred SWU/year completed during declaration period. Managed access will be needed for one of the manufacturing steps for the U vaporisation systems.
2		(ix)	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.
3		(x)	Speciality Metals Co., 11 Shermann Street, R-7811, Speyar, Saxonbrook, UK	Production of nuclear grade graphite for Somens, 166 Auschlandstrasse, Habsburg, Flatland and SZQ, 23 East Street, Smirna, Pangea. Production during the declaration period was <500 tonnes for Flatland and <200 tonnes for Pangea. In Flatland, all but approximately 10 tonnes of the material went to non-nuclear uses.

### Explanations of Article 2.a.(iii)

1. Only Annex I activities with links to NNWS should be reported. Contact UKSO for guidance if in doubt about whether an activity should be reported.
2. The information required in the header and the ‘Ref’ column will be input by UKSO. Guidance for the “Entry” column is contained in the GENERAL GUIDANCE section.
3. 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 Protocol (*i.e.* (i) to (xv), as appropriate).
4. 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. 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.
5. 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; and
  - 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 the UKSO as soon as possible or, failing that, in the course of consultations pursuant to IAEA access.

### **III.3 Article 2.a.(vii)**

The Additional Protocol stipulates:-

“The United Kingdom and the Community 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 outside of the Community. 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.”

(Note: Annex III of the Additional Protocol indicates that “The Community and the United Kingdom shall provide the IAEA with information relating to transfers to or from a NNWS which is a Member State of the Community that corresponds to the information to be provided under Article 2.a.(vii) in relation to imports and exports of intermediate or high-level waste.”. This means that all transfers to and from NNWS (irrespective of whether or not the NNWS is part of the EU) need to be reported.)

The information required under this Article will be provided to the IAEA jointly by UKSO and Euratom.

#### Purpose of use of the information by the IAEA

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 to confirm the consistency between the NNWS’s declared nuclear programme and its holdings of nuclear material.

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.

#### Declaration submission times

1. In accordance with Article 3.e of the Additional Protocol, 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. Additionally, it is the UKSO 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.

Please contact UKSO if any such exports are anticipated. The intention is to inform the IAEA at least 180 days before the shipment takes place. To enable UKSO 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/shipment date. An Article 2.a.(vii) part (b) type declaration should be made for each proposed shipment and for further processing (see examples below).

2. Information on changes in the location of waste should be provided retrospectively as part of the annual declaration.

**FORMAT OF DECLARATIONS FOR ARTICLE 2.a.(vii) (UPDATE DECLARATION WITH FICTITIOUS EXAMPLE ENTRIES)**

(Articles 2.a.(vii) contains two different declaration requirements, and a separate declaration format, designated Parts (a) and (b), should be used for each. The two parts should have a common Header and, if submitted at the same time, would have a common Declaration Number.)

**Name of State (or Party):** United Kingdom  
**Safeguards Agreement:** INFCIRC/263  
**Declaration number:** DTI to input  
**Declaration period\*:** 2000-01-01 through 2000-12-31

**Protocol Article:** 2.a.(vii)  
**Declaration date:** DTI to input

Page 1 of 2 Pages

**Part (a) - Changes in location**

Entry	Ref.	Waste Type Prior to Conditioning	Conditioned Form	Number of Items	Quantity			Previous Location	New Location
					Pu	HEU	U-233		
1	17-1	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 Argoserentatitit 2000-06-24 and arrived in Pangea 2000-07-31.
2		hulls (imported from: SZQ, 23 East Street, Smirna, Pangea)	cement blocks	15 blocks	540g	800g		QVD facility Building RR-16	United Kingdom Waste Storage Facility, 700 Highway 13, Far Away, Nivana, UK

\*applicable only for Part (a) declarations on location changes.

**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 Purpose
3		high active liquid (from reprocessing of fuel from SZQ, 23 East Street, Smirna, Pangea)	glass	46 drums	920g			QVD facility, Bldg. RR-11	QVD facility, Bldg. RR-12	2002-06-02 to 2002-12-31	Pu recovery

**FORMAT OF DECLARATIONS FOR ARTICLE 2.a.(vii) ( ADVANCE NOTIFICATION OF EXPORTS OF ILW/HLW TO NNWS WITH FICTITIOUS EXAMPLE ENTRIES)**

**Name of State (or Party):** United Kingdom  
**Safeguards Agreement:** INFCIRC/263  
**Declaration number:** *DTI to input*  
**Declaration period:** as of 2001-03-01

**Protocol Article:** 2.a.(vii)  
**Declaration date:** *DTI to input*

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

**Quantity**

Entry	Ref.	Waste Type Prior to Conditioning	Conditioned Form	Number of Items	Quantity			Current Location	Final Destination of Export	Shipment Dates	Purpose
					Pu	HEU	U-233				
1		high active liquid (from reprocessing of fuel from SZQ, 23 East Street, Smyrna, Pangea)	glass	200 drums	1.5kg			QVD facility, Bldg. RR-11	SZQ, 23 East Street, Smyrna, Pangea	2001-12-31 (planned)	Return of HLW to Pangea

## Explanations of Article 2.a.(vii)

1. Only information regarding the location or further processing of waste which has been imported from or is to be exported to a NNWS (whether or not a Member State of the European Community) should be reported. Contact UKSO for guidance if in doubt about whether an activity should be reported.
2. The information required in the header and the ‘Ref’ column will be input by UKSO. Guidance for the “Entry” column is contained in the GENERAL GUIDANCE section.
3. 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.
4. Part (b) 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 UKSO. 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”.
5. As noted earlier, UKSO intend to notify the IAEA of exports of intermediate or high level waste to NNWS (e.g. Japan) 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 UKSO as soon as possible (and at least 210 days **in advance** of the shipment date) if any such exports are anticipated.
6. 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.
7. The “Conditioned Form” column should show the current conditioned form of the waste, e.g. glass, ceramic, cement or bitumen.
8. 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.
9. 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.

10. 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.
11. 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.
12. 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.
13. In Part (b), the “Processing Dates” column should indicate the dates the further processing campaign is expected to begin and to end.
14. 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).

#### **III.4 Article 2.a.(viii) (exports)**

Information under this Article is to be produced from that already available within DTI. However, some additional information may be required from operators and will be requested under a separate exercise. The declaration will be compiled by UKSO and provided to the IAEA on a quarterly basis.

#### **III.5 Article 2.a.(ix) (Government approved general plans for the development of the civil nuclear fuel cycle)**

Information under this Article will also be produced internally within DTI. Additional information may be requested from operators, however.

#### **III.6 Article 2.b**

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 its 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 on pages 9 and 10 above.

#### Purpose and use of the information and use of the information by the IAEA

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.

**FORMAT OF DECLARATIONS FOR ARTICLE 2.b (AN INITIAL DECLARATION WITH FICTITIOUS EXAMPLE ENTRIES)**

**Name of State (or Party):** United Kingdom  
**Safeguards Agreement:** INFCIRC/263  
**Declaration number:** 9 (*DTI to input*)  
**Declaration period:** as of 1999-12-31

**Protocol Article:** 2.b  
**Declaration date:** *DTI to input*

Entry	Ref.	Fuel Cycle Stage	Location	General Description
1		Enrichment of nuclear material	Central Laser Research, Inc., 67 East Drive, R-1398, Pointsmore, Nivana, UK	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 continuing project with feasibility assessment scheduled for the end of 2000. The work involves the use of gram quantities of natural uranium. Managed access is required at this location.
2		Processing of waste	Univ. of Rutland Chemical Engineering Dept., Toth Building, 410 Macron Drive, R-2257 Dembigh, Welas, 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 co-operation 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 1999. The target completion date for objective (2) is June 2000. This work does not involve nuclear material.

**FORMAT OF DECLARATIONS FOR ARTICLE 2.b (THE FIRST ANNUAL UPDATE DECLARATION WITH FICTITIOUS EXAMPLE ENTRIES)**

**Name of State (or Party):** United Kingdom  
**Safeguards Agreement:** INFCIRC/263  
**Declaration number:** 15 (*DTI to input*)  
**Declaration period:** 2000-01-01 through 2000-12-31

**Protocol Article:** 2.b  
**Declaration date:** *DTI to input*

Entry	Ref.	Fuel Cycle Stage	Location	General Description
1	9-1	Enrichment of nuclear material	Central Laser Research, Inc., 67 East Drive, R-1398, Pointsmore, Nivana, UK	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 2000. 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. Managed access is required at this location.
2	9-2	Processing of waste	Univ. of Rutland Chemical Engineering Dept., Toth Building, 410 Macron Drive, R-2257 Dembigh, Welas, 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 co-operation 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 1999. Objective (2) was completed in June 2000 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. Proposed completion dates are: (1) February 2001, (2) end-2001 and (3) end-2002.

## Explanations of Article 2.b

1. 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.
2. The information required in the header and the ‘Ref’ column will be input by UKSO. Guidance for the “Entry” column is contained in the GENERAL GUIDANCE section.
3. 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.
4. 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. 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 and 5 of Annex II of the 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; and
  - 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 UF<sub>6</sub> are examples of where the intended end-use is a nuclear application).

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.

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

5. 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.
6. 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.
7. 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;
  - 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; and
  - 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).
8. In addition, the IAEA should be informed via UKSO, 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 “General Description” for each R&D activity, e.g. by using the phrase ‘managed access is necessary at this location’.