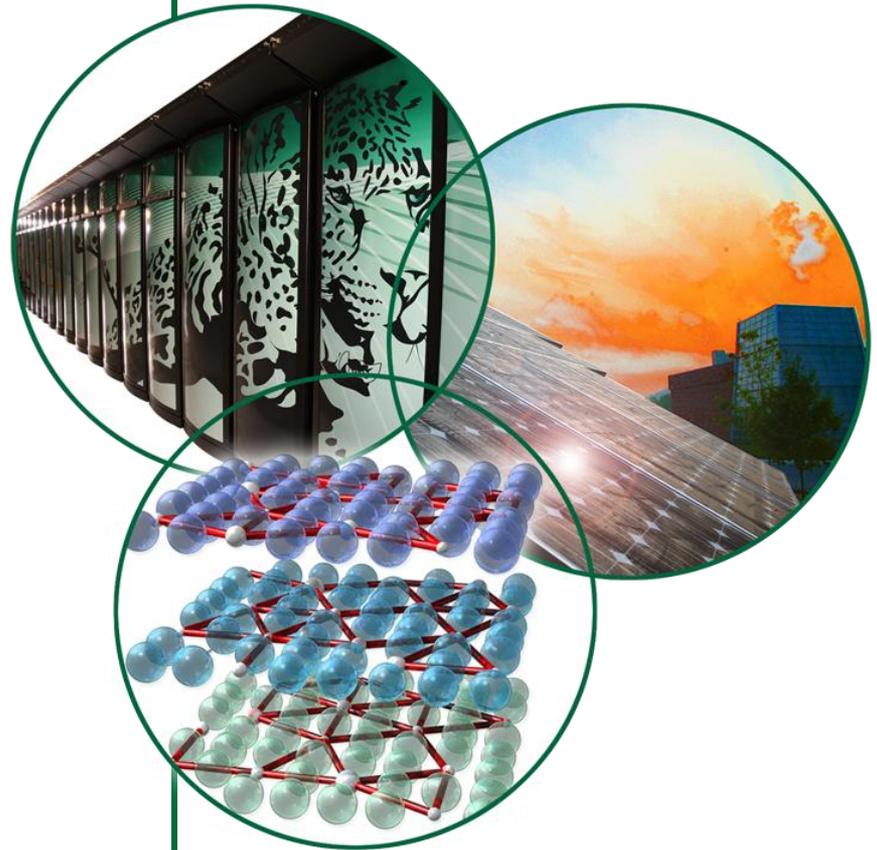


DOE Additional Protocol Implementation

NGSI Summer Seminar Series

Ron Cain
June 29, 2011



Additional Protocol History

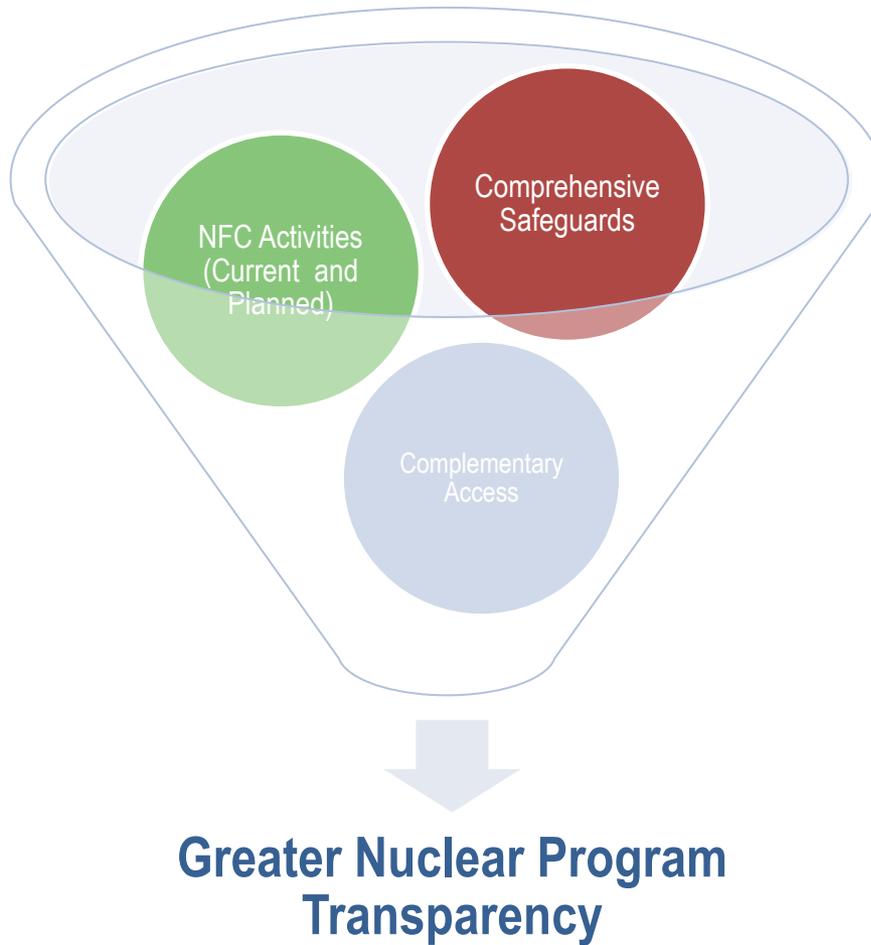
Nuclear Non-Proliferation Treaty (NPT)

- Entered into force March 1970
- Signed by more than 180 countries
- International Atomic Energy Agency (IAEA) verifies compliance with safeguards agreements

The case of Iraq

- Undeclared enrichment next to inspected facilities were not discovered by the IAEA
- Revealed by Allies during first Gulf War in 1991
- Additional information and access needed by the IAEA to detect such activities

Purpose of the Additional Protocol



**Note: The AP
amends the
Safeguards
Agreement and takes
precedence in case
of conflict between
the two.**

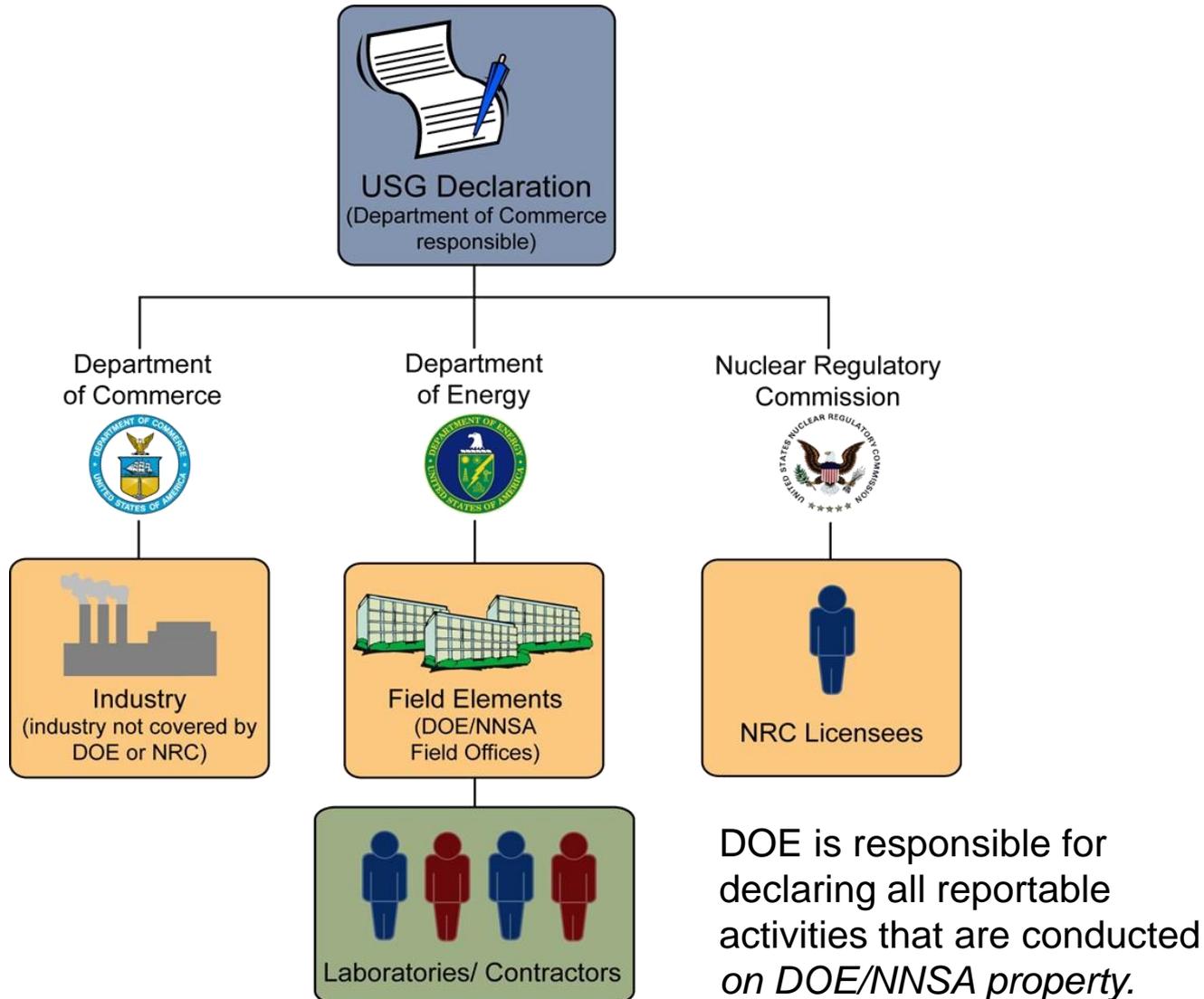
What is Declarable?

- **2.a (i) – Nuclear fuel cycle related research and development**
- **2.a (ii) – Safeguards efficiency measures at facilities**
- **2.a (iii) – Sites**
- **2.a (iv) – Manufacturing**
- **2.a (v) – Uranium and thorium mines**
- **2.a (vi) – Source material**
- **2.a (vii) – Nuclear materials exempted from IAEA safeguards**
- **2.a (viii) – Waste processing containing SNM on which IAEA safeguards were terminated**
- **2.a (ix) – Annex II Imports and Exports**
- **2.a.(x) – 10-year Fuel Cycle Plan**

US AP Timeline

- **1991 – Clandestine nuclear weapons program discovered in Iraq**
- **1997 – The IAEA approves the Model Additional Protocol**
- **1998 – President Clinton signs the Additional Protocol**
- **2002 – President Bush sends the Additional Protocol to the Senate for ratification**
- **2004 – U.S. Senate gives unanimous advice and consent**
- **January 6, 2009 – U.S. AP enters into force**
- **July 3, 2009 – U.S. submits initial declaration to the IAEA**

Lead Agency Jurisdiction in AP Implementation



DOE's Objective

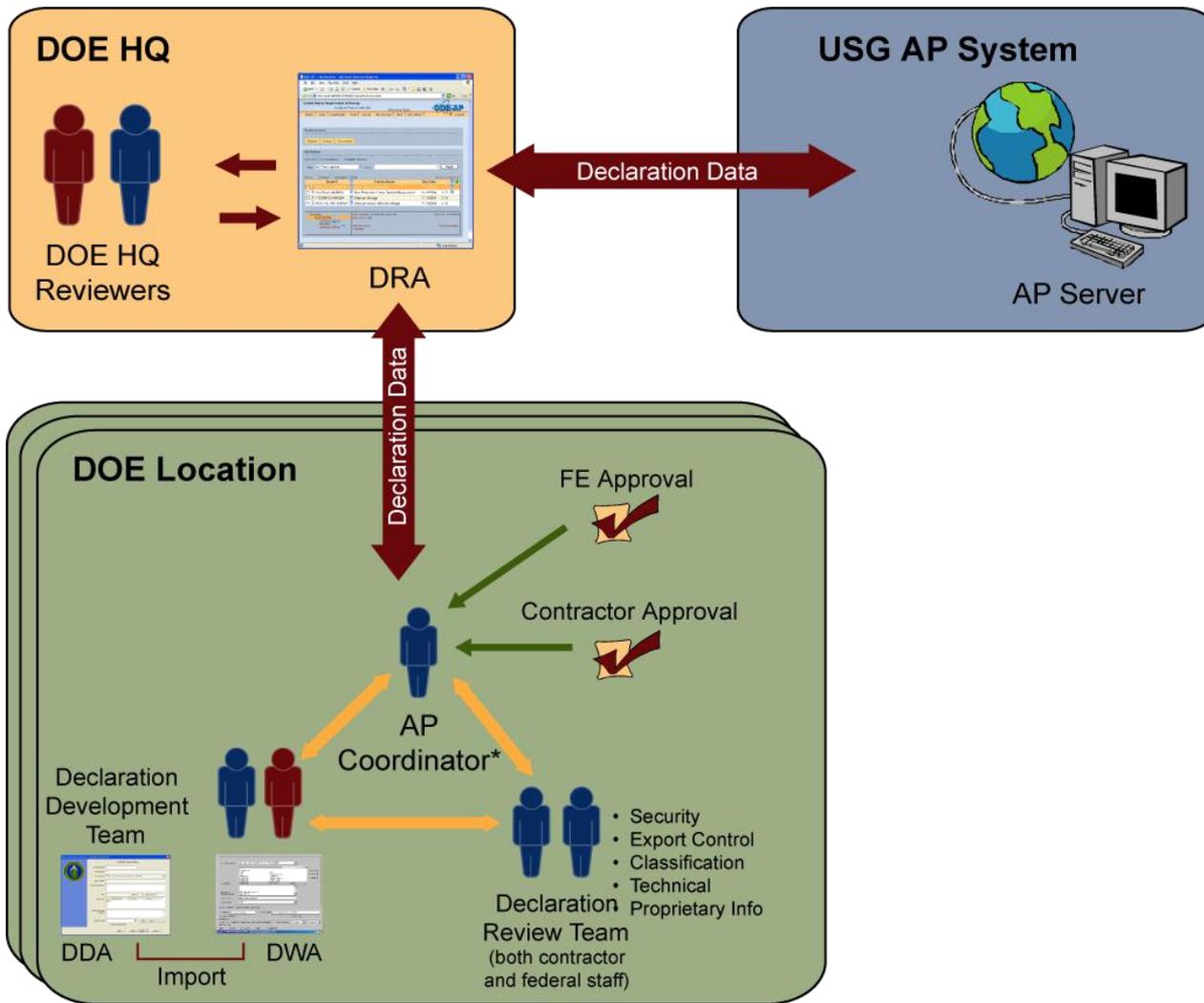
Devise a declaration process that:

- **Protects national security (no classified information)**
- **Provides for secure handling and storage of OOU information**
- **Ensures a complete and accurate declaration**
- **Is timely (narrow windows of time to report)**
- **Provides ready access to declaration information on a need to know basis**
- **Supports the Department of Commerce data collection and reporting process**
- **Is efficient, reliable, and repeatable**

Additional Protocol Reporting System (APRS) Components Summary

- **Declaration Decision Assistant (DDA)**
 - Identify declarable activities
 - Review and approve DDA files
 - Save files for export to DWA
- **Declaration Review Assistant (DRA)**
 - Transfer data to/from AP Coordinators (APCs)
 - Facilitate DOE HQ reviews
 - Transfer data to/from USG system
- **Declaration Writing Assistant (DWA)**
 - Develop declaration line items
 - Submit declaration data to DOE
 - Receive feedback and updates from DOE
- **DOE-AP Web Site**
 - AP related documents and links
 - FAQs
 - Online training
 - Desktop software downloads

AP Process Implementation – The DOE APRS



Declaration Decision Assistant (DDA)

- **Windows-based desktop PC application**
- **Local control of data - Uses portable XML files for data storage and distribution**
- **Major Functions**
 - **Define activities to be evaluated**
 - **Determine the articles under which each activity is potentially declarable**
 - **Produce files and reports to support preliminary internal reviews**
 - **Produce files for further use in the DWA**

Declaration Decision Assistant (DDA)

Activity Editor

INL-05-AFCI-EIMFT-01 | INL-05-AFCI-EDFT-02 | INL-05-AFCI-MFT-03 | INL-05-AFCI-MSA-04

Activity Identifier: INL-05-AFCI-EIMFT-01 Delete This Activity

Activity Name: Engineering and fabrication processes for inert-matrix

Installation/Lab: Idaho National Laboratory

Organization/Address: 1955 Fremont

City: Idaho Falls State: ID

Location(s):	Building/Center	Room/Area
▶	Building 752	Analytical lab
	Building 752	Analytical lab
	Building 752	Analytical lab

Activity Comments: This work involves the development of fabrication ed demonstrate feasibility of fabricating non-fertile, inert incorporating Pu and minor actinides into a fuel form

Originator: Meyer

* Only the selected name will be imported into the

† Indicates required data.

INL_AFCI05_Fuels_SysAnalysis 0305.dda - DOE Declaration Decision Assistant

File View Help

2.a.(i) | 2.a.(ii) | 2.a.(iv) | 2.a.(v) | 2.a.(vi) | 2.a.(vii) | 2.a.(viii) | 2.a.(ix) | Summary

2.a.(i) - Nuclear Fuel Cycle Related Research and Development

Status: Complete - DECLARATION REQUIRED.

Question

Does this activity engage in civil nuclear fuel cycle related research and development?

Tip: What activities are included?

Response

	Yes	No
INL-05-AFCI-EIMFT-01	<input checked="" type="radio"/>	<input type="radio"/>
INL-05-AFCI-EDFT-02	<input checked="" type="radio"/>	<input type="radio"/>
INL-05-AFCI-MFT-03	<input checked="" type="radio"/>	<input type="radio"/>
INL-05-AFCI-MSA-04	<input checked="" type="radio"/>	<input type="radio"/>

All Yes All No

Restart Article << Previous Next >>

Activity Name	2.a.(i)	2.a.(ii)	2.a.(iv)	2.a.(v)	2.a.(vi)	2.a.(vii)	2.a.(viii)	2.a.(ix)
INL-05-AFCI-EIMFT-01	+	-	-	-	-	-	-	-
INL-05-AFCI-EDFT-02	+	-	-	-	-	-	-	-
INL-05-AFCI-MFT-03	+	-	-	-	-	-	-	-
INL-05-AFCI-MSA-04	+	-	-	-	-	-	-	-

Legend

Not Started In Process Declaration NOT Required Declaration Required

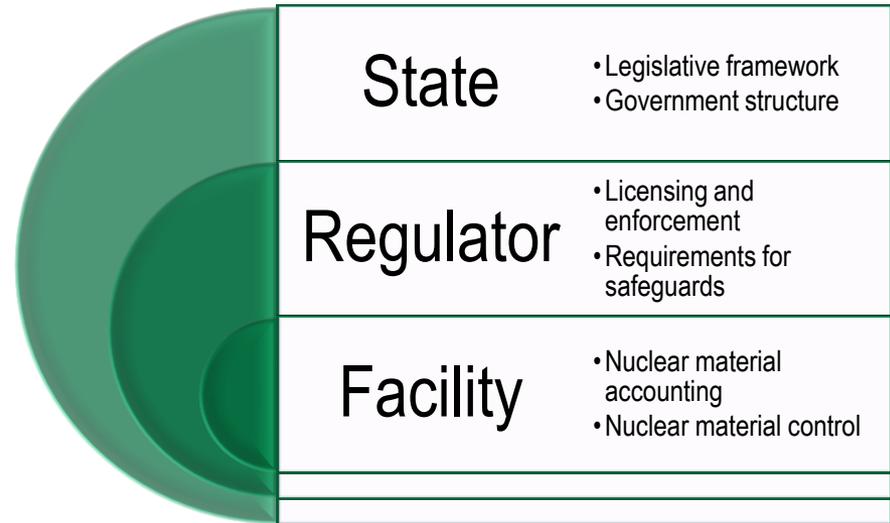
Office of Nonproliferation and International Security

International Nuclear Safeguards and Engagement (INSEP)

- **Mission:** Collaborate with partners to strengthen domestic and international safeguards at all stages of nuclear development
- **Vision of Safeguards Infrastructure:** Cooperate with international partners through technical engagement projects to develop nuclear infrastructure that emphasizes safeguards, security, and nonproliferation

Safeguards Infrastructure Objectives

- Establish long-term relationships with key organizations and individuals in nuclear-developing states.
- Support development of indigenous capacities for international and domestic nuclear safeguards.
- Promote best practices consistent with international norms and standards.



Fostering the Components of an Effective State Systems of Accounting for and Control of Nuclear Material

Additional Protocol Implementation

- Support for implementation of the AP tailored to states depending on ratification status
 - Joint Assessment of Needs in AP Implementation
 - Working-Level Training on Specific AP Implementation Issues (e.g., complementary access training with IAEA)
 - Commodity Identification Training
 - Seminars for Policy Makers
 - Outreach Strategies
 - Software Training
 - Protocol Reporter and Declaration Helper
 - <http://nnsa.energy.gov/aphelper>

The screenshot shows the 'AP Declaration Helper - Interview' web application. At the top is the NNSA logo. Below it, the title 'AP Declaration Helper - Interview' is displayed. The interface is divided into several sections: 'Interview Information' with a text input field for 'Interview Name'; 'Nuclear Fuel Cycle Research and Development' with a question about research activities and a list of bullet points (Conversion of nuclear material, Enrichment of nuclear material, Nuclear fuel fabrication, Reactors, Critical facilities, Reprocessing of nuclear fuel, Processing of waste); 'Buildings and Sites' with a question about site identification; 'Interview Results' with radio buttons for 'Likely to be declarable', 'Unlikely to be declarable', and 'Not Complete'; and 'More Information' with a 'What comes next?' link. There are also 'Options' for 'Interview Report' and 'Restart'.

Snapshot of AP Declaration Helper

Challenge Statement

One of the most critical factors in assembling an effective declaration in a timely manner is determining what is and is not declarable. Experience has shown that individuals most familiar with the technical aspects of a given activity are frequently the least familiar with the Additional Protocol and its reporting requirements. Outreach programs, although highly effective, are resource intensive and may not extend to the level of the technical expert.

The AP Declaration Helper

- **Developed by DOE/NNSA as part of the INSEP Program**
- **Requires no prior AP training (not a substitute)**
- **Based on the DOE Declaration Decision Assistant**
- **Addresses Additional Protocol Article 2 only**
- **Vetted through the IAEA and two member states preparing for AP entry-into-force**

Design Components

Informational Website – The portal for accessing the interview tools.

- **Publicly available:** does not require login or registration
- **Acts as a gateway to the interview modules**
- **Contains information on the AP and the AP Declaration Helper, Frequently Asked Questions on how to use the tools, links to other resources, and an e-mail contact**
- **Does not attempt to copy or duplicate resources that can be readily obtained from the IAEA website**
- **Available at: <http://nnsa.energy.gov/aphelper>**

AP Declaration Helper Home Page



5/8/2010

[Home](#) | [Help](#) | [FAQ](#) | [Contact Us](#) | [Downloads](#)

AP Declaration Helper

Welcome to the AP Declaration Helper

Home

Announcements:

Interview

The AP Declaration Helper Web Site is launched!

Help

FAQ

Contact Us

Downloads

Get Help with the IAEA Additional Protocol

Because you are reading this web page, there is a good chance that you already know about the Additional Protocol (AP) and why it may be important to you. If you'd like to learn more, click [here](#). Even if you are familiar with the AP, however, it can be difficult for you or your colleagues to recall the details of the requirements of each article of the agreement.

Welcome! The AP Declaration Helper web site is here to help you.

This web site offers information and tools designed to simplify the task of identifying nuclear-related activities that are [likely to be declarable](#) under the AP. The primary resource for doing this is a decision support software tool called the AP Declaration Helper. The AP Declaration Helper guides you through simple questionnaires that help you navigate through the declaration decision process without intimate knowledge of the AP. The tool has built-in expertise regarding the AP requirements; you need only know the technical details about the nuclear-related activities that you'd like to evaluate.

By assembling and cross-referencing a wide array of information from and related to the [Model Additional Protocol \(INFCIRC/540 \(Corrected\)\)](#), we've taken some very complex information and broken it down into a form that is easy to use and understand. All you have to do is answer a series of simple Yes/No questions to determine whether an activity is likely to be declarable.

All of the resources on this site are also available in a version designed to operate offline on your personal computer. You can download the desktop version on the Downloads page. You may use these resources online or download everything you see here for use on a non-internet connected computer system.

For more information about the AP, visit the [IAEA's official web site](#).

CAUTION!

The AP Declaration Helper web site is intended to assist users in identifying information that is likely to be declarable to the IAEA under Article 2 of the Additional Protocol. However, it is only a tool. **No part of this web site is intended to provide authoritative information or definitive results** and its use is subject to a number of limitations. For example, when using the AP helper Interview tool, the user must determine which activities to consider evaluating. The Declaration Helper provides no means of assuring that the user has in fact considered all activities that need to be evaluated. Further, answering an interview question correctly requires the user to apply judgment and knowledge concerning the activity being evaluated in order to produce accurate results. Users should also be aware that this tool is based on the Model Additional Protocol (INFCIRC/540 (Corrected)), so it does not address any modified or additional provisions that may be included in some States' versions of the AP. Ultimately, **it is the responsibility of the State to provide complete and accurate information to the IAEA under AP Article 2**. While the AP Declaration Helper web site can assist users involved in this process, it is no substitute for a comprehensive and systematic evaluation by the State and by those organizations and individuals that the State has chosen to make responsible for providing input to its declaration.

Design Components (cont.)

Single Activity Evaluation Interview

- Used to evaluate a single activity to determine and document whether the activity is or is not likely to be declarable
- Must be completed separately for each activity to be evaluated

Use this interview if you are aware of a specific activity and want to determine if it is likely to be declarable.

Single Activity Interview



5/8/2010

[Home](#) | [Help](#) | [FAQ](#) | [Contact Us](#) | [Downloads](#)

AP Declaration Helper

Interview

- Home
- Interview**
- Help
- FAQ
- Contact Us
- Downloads

Interview Information

Interview Name: **Activity 1**

Options:

[Interview Report](#)
[Restart](#)

AP Declaration Helper Interview

Nuclear Fuel Cycle Research and Development

Does this activity involve nuclear fuel cycle-related research and development that is specifically related to any process or system development aspect of any of the following? Yes No

- 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?

Does this research and development activity involve nuclear material? Yes No

Tip: R&D Activities and Nuclear Material - What must be declared?

Is this research and development activity authorized by, controlled by, carried out on behalf of, or partially or fully funded by the State? Yes No

Tip: State involvement in R&D activities

Is this research and development activity 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? Yes No

Buildings and Sites

Does your building or location fit the definition of a Site as defined by (State's) Comprehensive Safeguards Agreement with the IAEA? Yes No

Manufacturing, Assembly, and Construction

Does this activity involve any of the following manufacturing, assembly, or construction activities related to the nuclear fuel cycle? Yes No

- The manufacture of centrifuge rotor tubes or the assembly of gas centrifuges?
- The manufacture of diffusion barriers?

[Likely to be declarable](#)

[Unlikely to be declarable](#)

[Not Complete:](#)

- 2.a.(i) / 2.b.(i)
- 2.a.(iii)
- 2.a.(iv)
- 2.a.(v)
- 2.a.(vi)
- 2.a.(vii)
- 2.a.(viii)
- 2.a.(ix)
- 2.a.(x)

[What comes next?](#)

Single Activity Interview (cont.)

Nuclear Fuel Cycle Research and Development

Does this activity involve nuclear fuel cycle-related research and development that is specifically related to any process or system development aspect of any of the following? Yes No

- Conversion of nuclear material
- Enrichment of nuclear material
- Nuclear fuel fabrication
- Reactors
- Critical facilities
- Reprocessing of nuclear fuel
- Processing (not including repackaging, storage or disposal) of intermediate uranium-233?

Does this research and development activity involve any of the following?

Tip: R&D Activities and Nuclear Materials

Is this research and development activity authorized by, controlled by, carried out on behalf of, or partially or fully funded by the State? Yes No

Tip: State involvement in R&D activities

Is this research and development activity 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? Yes No

Does this activity involve nuclear fuel cycle-related research and development that is specifically related to any process or system development aspect of any of the following?

Buildings and Sites

Does your building or location fit the definition of a Site as defined by (State's) Comprehensive Safeguards Agreement with the IAEA? Yes No

Manufacturing, Assembly, and Construction

Does this activity involve any of the following manufacturing, assembly, or construction activities related to the nuclear fuel cycle? Yes No

- The manufacture of centrifuge rotor tubes or the assembly of gas centrifuges?

APDH Single Activity Interview (cont.)

Nuclear Fuel Cycle Research and Development

Does this activity involve nuclear fuel cycle-related research and development that is specifically related to any process or system development aspect of any of the following? Yes No

- Conversion of nuclear material
- Enrichment of nuclear material
- Nuclear fuel fabrication
- Reactors
- Critical facilities
- Reprocessing of nuclear fuel
- Processing (not including repackaging or storage or disposal) of intermediate or uranium-233?

Does this research and development activity...
Tip: R&D Activities and Nuclear Material - W

Is this research and development activity... or fully funded by the State?
Tip: State involvement in R&D activities

Is this research and development activity... the processing of intermediate or high-level uranium-233?

Buildings and Sites

Does your building or location fit the definition... Agreement with the IAEA?

Manufacturing, Assembly, and Construction

Does this activity involve any of the following manufacturing, assembly, or construction activities related to the nuclear fuel cycle? Yes No

- The manufacture of centrifuge rotor tubes or the assembly of gas centrifuges?

Nuclear Fuel Cycle Research and Development

The activity is likely to be declarable under article 2.a.(i).

The activity is unlikely to be declarable under article 2.b.(i).

OK

Design Components (cont.)

Multiple Activity Evaluation/Identification Interview

- Used to evaluate multiple activities within a State, Party, organization, or other entity
- May be used to develop a list of activities that are likely to be declarable

Use this option if, for example, you want to evaluate a program to see if any of the program's activities might be declarable.

Multiple Activity Interview

Nuclear Fuel Cycle Research and Development

Do any activities in (Organization) involve nuclear fuel cycle-related research and development that is specifically related to any process or system development aspect of any of the following? Yes No

- Conversion of nuclear material
- Enrichment of nuclear material
- Nuclear fuel fabrication
- Reactors
- Critical facilities
- Reprocessing of nuclear fuel
- Processing (not including repackaging, storage or disposal) of intermediate or uranium-233?

Of these activities, are there any that do

Tip: R&D Activities and Nuclear Material -

Of these activities, are any authorized by (State)?

Tip: State involvement in R&D activities

Are there any others that are NOT authorized by, controlled by, carried out on behalf of, or partially or fully funded by (State)? Yes No

Of these other activities, are any specifically related to any of the following?

Yes No

- Enrichment
- Reprocessing of nuclear fuel
- Processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233

Do any activities in (Organization)
involve nuclear fuel cycle-related research and development that is specifically related to any process or system development aspect of any of the following?

Multiple Activity Interview (cont.)

Interview

Interview Information

Interview Name: **Organization 1**

Options:

[Interview Report](#)
[Activities Report](#)
[View Activities](#)
[Restart](#)

Activities

Article	Activity Name	Activity Comments		
2.a.(i)	Activity 1	Project A	Edit	Delete
2.a.(i)	Activity 2	Laboratory Research B	Edit	Delete
<input type="text" value="2.a.(i)"/>	<input type="text" value="Activity 3"/>	<input type="text" value="Project B"/>	Insert Cancel	

[Return To Interview](#)

Features

- **Indicates the article(s) under which an activity is likely to be declarable**
- **Status bar provides real time updates as the interview progresses**
- **Reports**
 - Interview results
 - Summary of potentially declarable activities
- **Does not collect data**
- **Two versions are available**
 - Web-based interview
 - Downloadable standalone (non-networked)
- **Able to save and resume a partially completed interview (standalone version only)**

Translation Capability

- **System design separates program executable modules from text, which is accessed as .xml and .resx files. All narrative, including system help files (which were developed using a conventional HTML help file structure), are editable in this manner.**
- **Because functionality and display are managed separately, it is possible to create translations of the AP Declaration Helper simply by substituting translated versions of the text files**
- **Any initiative to produce a translated version, however, must consider the importance in achieving an accurate translation as an imprecise translation can prove misleading and could contribute to an inaccurate or incomplete declaration.**

Important

It is important to note that the AP Declaration Helper must not be considered the final authority on declarability. It is only a support tool to assist in the determination, and should only be viewed as one of several sources of analysis.

Conclusions

- **Identifying declarable activities requires both in-depth knowledge of Additional Protocol reporting requirements and a comprehensive technical understanding of the activity being considered.**
- **The Additional Protocol Declaration Helper is a valuable, easily accessible, and secure frontline resource to assist AP experts in the identification of activities declarable under article 2 of the Additional Protocol.**



Citations

- ***The Additional Protocol: A New Phase of International Safeguards*, Hansen, Killinger**
- ***DOE Additional Protocol Reporting System Overview*, Kovacic, Hannan**
- ***DOE International Nuclear Safeguards and Engagement Program: Safeguards Infrastructure Cooperation*, Sunshine, Van Sickle**
- ***The Additional Protocol Declaration Helper: A Software Tool to Help Determine What Must be Declared to the IAEA*, Cain**
- ***DOE AP Declaration Helper Software*, Cain**