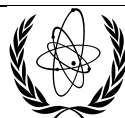


## STATEMENT OF WORK

### Development of e-learning modules on Spent Fuel Management

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## 1. Scope

This SOW describes the requirements for production of e-Learning modules on SFM on the basis of already developed, prepared and reviewed 14 Lectures (see list in Annex 1). The technical content for each lecture is structured following a block-diagram layout (see example in Annex 2) and developed into a storyboard.

The e-Learning modules shall provide capabilities to support training and assessment of knowledge for educational, training and information sharing purposes. These e-Learning modules target young professionals, university students and professionals in general which would like to receive an overview of the different aspects and challenges of the management of spent fuel from power reactors, before its final disposition as a waste, focusing on storage, transportation, reprocessing and recycling aspects. These e-Learning modules will be made publicly available on the IAEA webpages under Online Learning Services (CLP4NET) and on the IAEA CONNECT platform.

The Contractor shall develop 14 Lectures indicated in Annex I, divided into three (3) phases as specified below, in order to reflect and incorporate the lessons learnt during the e-Learning development process.

Phase I - Development of the following three (3) Lectures:

- Lecture 1.1 on General Overview. Options;
- Lecture 1.2 on Factors that could influence the choice of SFM strategy; and
- Lecture 3.1 on Spent Fuel Characteristics.

Phase II - Development of the remaining 11 Lectures as indicated in Annex 1; and

Phase III. - Production of translated versions of all 14 Lectures listed in Annex 1 into four (4) different languages (Japanese, Russian, French and Spanish) on the basis of translated storyboards provided by the IAEA.

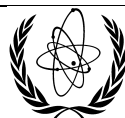
The 14 Lectures shall be produced in accordance with the developed storyboards and corresponding block-diagrams (see block-diagram example in Annex 2). The storyboards of each lecture are drafted to last around 45 -55 minutes. The 14 Lectures are gathered in 7 topical modules (see list in Annex 1).

The Contractor shall produce the 14 Lectures indicated in Annex 1, providing consistent, pedagogically effective and attractive solutions to make the content attractive and appealing to the users. The IAEA will provide to the Contractor the Lecture(s) content in written format (storyboards) as well as some related videos and pictures. The IAEA project officer will be available for clarification of any aspects of the production process as needed.

The Contractor should be familiar with spent fuel management topics, demonstrating sound knowledge and experience that is necessary to produce consistent and high quality e-Learning materials. According to the different topics to be covered, the Contractor shall propose and discuss with the IAEA the most suitable multimedia tools to be used in the production of the 14 Lectures as e-Learning modules, in order to contribute to its didactic value and improve the learning possibilities.

The e-Learning modules shall include narrations to make the lectures more attractive. The narrations should be of high quality, properly recorded as further outlined under Section 6 below. The IAEA reserves the rights to choose the narrator upon suggestions from the Contractor.

Any copyright and intellectual property issues, such as, for quotes, pictures, illustrations, photos or animations shall be handled by the Contractor accordingly. All respective documentation shall be provided by the Contractor to the IAEA. When required, the IAEA will support the Contractor in obtaining the necessary agreements free of charge.



## 1.1. Background

Substantial work has already been implemented by the Division of Nuclear Fuel Cycle and Waste Technology on the development of e-Learning modules in the area of radioactive waste management, environmental remediation and decommissioning of nuclear facilities. These modules cover predisposal and disposal of radioactive waste, disused source management, decommissioning and environmental remediation as well as the disposal of HLW and spent fuel, if considered as waste. However, the steps for the management of spent fuel prior to its eventual disposition as a waste were not initially included in the original e-Learning modules. Therefore it was agreed to expand the existing e-Learning Curriculum Map, available on CLP4NET and the CONNECT platform, including SFM topics in order to fully cover the back-end of the Nuclear Fuel Cycle. Some activities covered in the modules dedicated to SFM are inter-related and have interfaces with some already developed modules. Therefore, links from one lecture to another lecture in different modules have to be created. The IAEA will provide the respective information on the necessary links to connect the new material with the already developed one.

## 2. Schedule

A Kick off meeting to provide the Contractor with the detailed technical information (storyboards and block-diagrams) to be included in the e-Learning modules and to discuss and agree the production process (two (2) weeks ARO).

As briefly outlined under Section 1, the production process will consist of three (3) phases with the following timelines:

### **Phase I - Development of the following three (3) Lectures:**

- Lecture 1.1 on General Overview. Options;
- Lecture 1.2 on Factors that could influence the choice of SFM strategy; and
- Lecture 3.1 on Spent Fuel Characteristics.

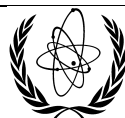
Phase I shall be completed within two (2) months ARO. Once Lectures 1.1, 1.2 and 3.1 have been produced and accepted by the IAEA, the IAEA will decide whether it will authorise the Contractor to proceed with Phase II.

### **Phase II - Development of the remaining 11 Lectures as indicated in Annex 1**

A set of Phase II storyboards and block-diagrams will be provided by the IAEA to the Contractor. Lectures produced in Phase II shall be delivered within six (6) months after acceptance of Phase I.

### **Phase III. - Production of translated versions of all 14 Lectures listed in Annex 1 into four (4) different languages (Japanese, Russian, French and Spanish) on the basis of translated storyboards provided by the IAEA.**

Upon successful completion and acceptance of Phase II, the IAEA will provide the Contractor with storyboards for the 14 Lectures translated into four (4) different languages (Japanese, Russian, French and Spanish). The Contractor shall deliver the translated versions of the e-Learning modules within three (3) months after receipt of the corresponding translated storyboards provided by the IAEA.



The Contractor shall organize periodic meetings with the IAEA's technical officers for the regular reviewing and following-up of the draft produced e-Learning modules during the production process as agreed with the IAEA technical officers. The periods of time for revision and the time required for that should be agreed with the IAEA staff. The purpose of the regular review process is to follow-up and to check the progress of the development to early detect and identify errors or inconsistencies in order to avoid potential later delays caused by the need of re-doing some parts of the e-Learning modules.

### 3. Target audience of the modules

The e-Learning modules on SFM are primarily designed to self-educate people that are interested in the management of spent fuel from the core to its final disposition as a waste. The target audience ranges from young professionals, university students, nuclear professionals from other disciplines as well as professionals in general.

### 4. Learning objectives of the modules

The learning objectives of the SFM e-Learning modules include all stages involved in the management of spent fuel from power reactors, once it is discharged from the core until its final disposition as a waste. The content of the e-Learning modules has been divided into 14 Lectures gathered into 7 topical modules (see Annex 1). All lectures are drafted to last approximately 45-55 mins each.

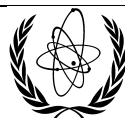
Modules 1, 2 and 3 are dedicated to address general information on SFM. They include 4 Lectures that cover an overview of the different policies and strategies and the factors that can influence the choice of the SFM strategy; the fundamental principles that apply to SFM activities and a description of the main characteristics of the nuclear fuel when it is considered spent.

Modules 4, 5, 6 and 7 contain the necessary technical information to describe the main stages of the management of spent fuel such as: SF Transportation (Module 4), SF Storage Options (Module 5), SF Reprocessing and Recycling (Module 6) and Advanced Fuels and Advanced Fuel Cycles (Module 7). Lectures corresponding to these modules are listed in Annex 1.

### 5. Definitions, Acronyms, and Abbreviations

The following definitions, acronyms, and abbreviations shall apply throughout this SOW unless defined otherwise hereinafter:

ARO	After Receipt of Order;
Block-diagram:	It is the structure and sequence of the information included in a specific storyboard. Example of a block-diagram in the context of this SoW is given in Annex 2;
CBT	Computer-Based Training;
e-Learning	In the context of this project e-Learning is defined as: Interactive learning material which is delivered enabled or mediated in mixed-media format (text, animations, videos, audio, narrations, etc.) by information and computer technologies (ICT);



e-Learning lecture	Technical information structured to explain and show a specific subject, defined previously;
e-Learning module	A collection of e-Learning lectures less than one specified topic. One e-Learning course can include several e-Learning modules;
End-User	The IAEA and its Member States;
H/w	Hardware;
IAEA	International Atomic Energy Agency;
IPR	Intellectual Property Rights;
LMS	Learning Management System;
MS	Member States;
NEFW	Division of Fuel Cycle and Waste Technology;
SAT	Systematic Approach to Training;
SCORM	Sharable Content Object Reference Model is a collection of standards and specifications for web-based e-Learning;
SFM	Spent Fuel Management;
SOW	Statement of Work;
Storyboard:	Is the way that the technical content of the e-Learning lectures are outlined and developed to facilitate the Contractor the production of them. The storyboards are the way that the content of a film is outlined for a production process and it was taken as an example to develop the technical content to be produced in the e-learning format;
S/w	Software; and
WBT	Web-Based Training.

## 6. Requirements

### 6.1. General Requirements

The Contractor shall develop and deliver e-Learning modules (14 Lectures) based on the technical content defined and delivered by the IAEA and listed in Annex 1. The e-Learning Lectures shall be based on the provided storyboards and block-diagrams indicated in Annex 1 and Annex 2 and developed according to world-wide good practices, international experience and including creative and pedagogically sound solutions and tools.

The e-Learning Lectures shall include, as a minimum, the following general features and functions:

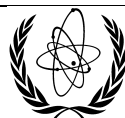


- These e-Learning modules will be part of the broader Curriculum Map of e-Learning material on Spent Fuel Management, Radioactive Waste Management, Decommissioning and Environmental Remediation, therefore compatibility (visual and technical) with already existing material is necessary as well as links to the related contents. The e-Learning lectures shall provide links and connections to other modules and lectures within the e-Learning Curriculum Map of the IAEA NEFW Division;
- Allow independent navigation across different modules and lectures within the Spent Fuel Management module;
- Be visually compatible with existing material: minimum is to use the same format and design of the cover page;
- Be simple and consistent navigation that guides the learner in a simple and user friendly manner through all lessons (easy to use, consistent and easy to access);
- Be pedagogically aimed at the target audience (adults, senior decision makers, professionals, university students) and shall support and motivate them in the learning process;
- Ensure effective use of mixed-media formats, i.e. text, narrations, audio, video, animations, interactive games and tests, appropriately combined to the learning aspects being delivered;
- Conform to the IAEA's Visual Identity Rules;
- Be gender, race, religion, and politically neutral; and
- Be organized or generated as an e-Learning training course.

## 6.2. Functional and Technical requirements for the e-Learning modules features and functions

The e-Learning modules shall include, as a minimum, the following technical features and functions:

- Be developed in compliance with the Sharable Content Object Reference Model, SCORM 2004, 4<sup>th</sup> Edition or later;
- Be designed:
  - As a cross-platform WBT module that can be hosted on a SCORM certified LMS; and
  - As a stand-alone, self-contained CBT module distributed on DVD and running on a local computer under Windows 7 (or later) or Mac OS X 10.7 (or later) operational system;
- Ability to track progress through the modules and to restart at the same location, if training was halted or not fully completed. It shall be apparent to the user which sub-modules or lessons he or she has already visited and which modules he or she has successfully completed;
- Provide start, stop, pause functions and cue points to control animations and videos;
- Volume controls shall be managed with global volume settings;

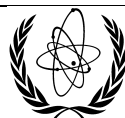


- IAEA relevant publications shall be used as the reference material for the e-Learning modules;
- Create a “Resource section” to easily find the references and materials used in developing the e-Learning modules or for additional information (this information will be provided by the IAEA);
- Assessment Quiz material shall be inserted as part of each lecture for comprehension assessment;
- A Glossary of important terminology (Terms will be provided by the IAEA) shall be accessible from the menu and via context sensitive links directly from the text;
- Provide full text search capabilities through all the modules as well as metadata based search (for graphics, audio, video, etc.);
- Include tutoring options where appropriate; and
- The Contractor shall professionally record quality narrations and to provide the Agency with the rights to choose the narrator (the voice and the accent to make the narration clearly understandable for non-English speaking Member States). The material for narrations will be provided in writing by the IAEA.

### 6.3. Requirements for the work

The Contractor shall carry out the following activities:

- Develop computer based e-Learning modules on SFM based on 14 Lectures already developed (listed in Annex 1), following the schedule agreed with the IAEA as it is described under “Schedule section”. Changes in the technical material or in the agreed timeline and schedule shall be agreed with the IAEA in writing;
- Develop an implementation plan for the delivery of e-Learning modules to the IAEA including agreed periods for revision by the IAEA staff of the delivered material;
- A proposal for the development of the e-Learning modules has to be presented to the IAEA to be approved, showing all features of e-Learning specified in this SoW (glossary, menu, resources, links, etc.);
- The e-Learning modules on SFM shall be produced in Phases as it is described in Section 1 and Section 2 of this SoW. After the acceptance by the IAEA of e-Learning lectures included in Phase 1 (Lecture 1.1, Lecture 1.2 and Lecture 3.1), the IAEA will decide and inform the Contractor about its authorization to proceed with the next phase(s). If such authorization is issued, the IAEA provide the Contractor with the rest of storyboards to produce the rest of the e-Learning modules under the scope of this SoW and listed in Annex 1 (Module 2, Module 4, Module 5, Module 6 and Module 7);
- The IAEA has the right to stop activities after Phase I development without any liability;
- Maintain a bug tracking tool and shall provide access for the IAEA to this tool. The IAEA shall be able to directly file issues in this tool. Issues filed by the Contractor shall be visible to



the IAEA. The bug tracking tool shall provide information about what features have been resolved in what software version;

- Maintain a quality assurance log for all deliverables and share this log with the IAEA;
- Report on the performance criteria as agreed in the implementation plan;
- Provide all files used in the development of the e-Learning modules for the IAEA's back-up and update purposes (e.g. audios, lectures, presentations, source files, etc.); and
- Once the e-Learning modules on SFM are produced and delivered in English, the Contractor shall produce the e-Learning modules into four (4) different languages (Japanese, Russian, French and Spanish) using the appropriate translated storyboards provided by the IAEA.

#### **6.4. Other Requirements (Intellectual Property Rights, Licenses)**

- The IAEA shall acquire all exclusive rights, including all transferable IPR and use rights, in the deliverables, including their specification, algorithms, architectural approach and technical solution and specifically all rights in software, sources and comments as contained therein. Such rights shall include the absolute right to develop, modify or have modified such software;
- There shall be no licence fees, once the e-Learning modules are handed over to the IAEA; and
- There shall be no limits on the number of users that can use the e-Learning modules.

#### **6.5. Requirements for Contractor Capability**

The Contractor shall meet the following requirements:

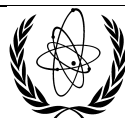
- Provide evidence of three successfully developed and delivered, of similar size or bigger, e-Learning modules to an external Customer(s). The Contractor shall provide the IAEA with references of the three relevant related projects;
- Provide evidence that the Project Manager and the key team have technical knowledge on nuclear energy and are sufficiently competent to develop and deliver the required e-Learning modules;
- The Project Manager of the Contractor shall have three (3) or more years of experience in leading comparable e-Learning development projects;

#### **6.6. Language requirements**

The language of all project discussion, review meetings, correspondence and acceptance activities shall be English. Any audio portions and narrations in the e-Learning modules, added by the Contractor, shall be recorded by a native or a fluent speaker in English.

Any audio portions and narrations in the e-Learning modules, added by the Contractor, shall be recorded by a native or a fluent speaker in the four (4) corresponding languages (Japanese, Russian, French and Spanish) for the development of Phase 3.





## 6.7. Software and Hardware requirements

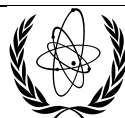
The Contractor shall meet the following software and hardware requirements for the e-Learning modules:

- Regular computer users with limited permissions (i.e. not necessarily administrators) shall be able to install and run the e-Learning modules;
- The need to install any software not contained on the distribution media shall be avoided;
- User interface shall be developed by Contractor. The user interface shall allow future customization;
- Be supplied with a software shell having the capacity and capability for future modifications, configuration management and for further update by the IAEA staff. The IAEA staff shall be trained by the Contractor to obtain the knowledge, tools and the rights to make modifications;
- Guarantee for a minimum period of one (1) year after successful delivery of the e-Learning modules including the availability of maintenance services for the e-Learning modules;
- Meet general requirements stated for training information systems in ISO, IEC, IEEE and other standards in this field; and
- The source code for the applied system shall be supplied. If the applied system does not have a source code, the associated software shell environment shall have the capability to enable modifications to be implemented.
- The e-Learning is designed to run on the following base system:
  - Platform: Windows 7, Windows 8, OSX 10, iOS and Android;
  - Minimum Screen Resolution: A screen resolution of 1024 x 768 or better is required; an adaptive design is an advantage to take into consideration device/screen size and browser variation; and
  - Browser: Internet Explorer versions 7, 8 and 9. Chrome 21 and 22. Firefox 14 and 15. Safari 5.1 and 6. Android Browser for Samsung Galaxy Tab and Asus Transformer Prime. iOS 6 or 7 Safari.

## 7. Deliverable Data Items

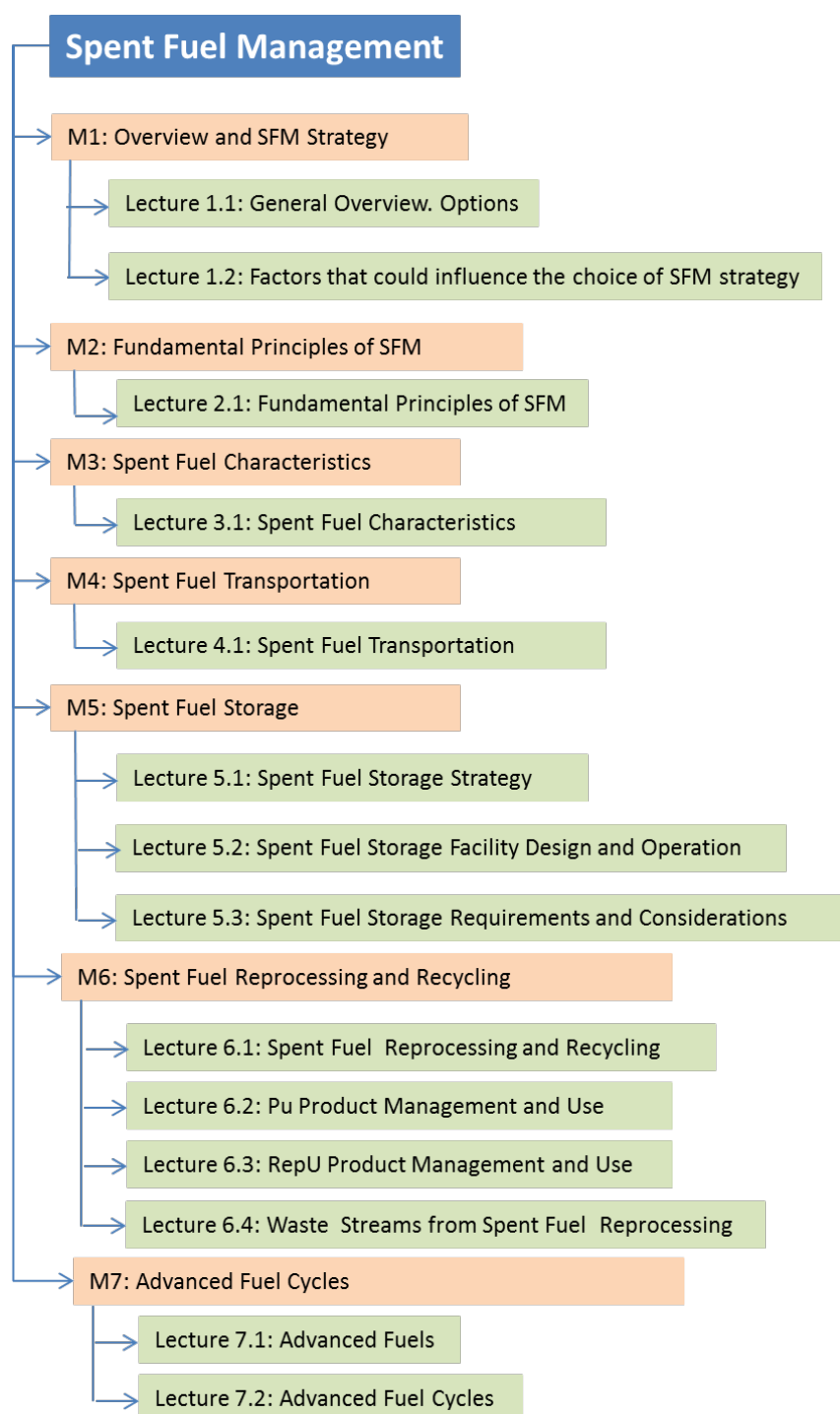
The Contractor shall deliver the following data items for each Phase:

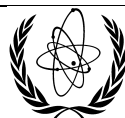
- The final project plan for the implementation of the E-learning modules, including timeline, milestones, deliverables and regular meeting schedule;
- 14 Lectures described in Annex 1 as e-Learning modules;
- User guide for the e-Learning modules described in Annex 1;
- Administrative Guide (including installation, modification, settings and configuration of the e-Learning modules); and
- Source code or the associated software shell environment. A minimum warranty period of one (1) year for the functionality of the deliverables.



## Annex 1

List of 14 Lectures to be produced. Lectures are gathered in topical e-Learning modules





### **Description of the developed technical material:**

The 14 Lectures to be produced are gathered in 7 topical modules covering general information related to Spent Fuel Management as well as technical information on the main steps of the management of spent fuel. Each lecture has been designed and developed to last around 45-55 minutes.

The following material has been drafted for each lecture:

- A block-diagram presenting the lecture content in a structured way.
- The IAEA will provide to the Contractor the Lecture(s) content in written format (storyboards) as well as some related videos and pictures. The block-diagram of Lecture 1 is given as an example in Annex 2.



## Annex 2

### Block-diagram of Lecture 1

Module 1 SFM OVERVIEW AND STRATEGY  
Lecture SFM 1.1 General overview - options

