



## **INSC Project MC3.01/13**

EC Contract N° NSI/2014/343-969

**“Training and Tutoring for experts of the NRAs and their TSOs for developing or strengthening their regulatory and technical capabilities”**

### **TASK 2**

#### **Tutoring Module**

**on**

**“Safety evaluation, licensing and oversight of Research Reactors (RR)”**

**October 8 – November 30, 2018**

c/o JSI & SNSA Ljubljana Slovenia

#### **Tutoring Program**

*Draft*

*September 2018*



**INSC Project MC3.01/13  
EC Contract N° NSI/2014/343-969**

**TASK 2**

**Tutoring Module on  
“Safety evaluation, licensing and oversight of Research Reactors (RR)”**

**Duration: 8 weeks - October 8 – November 30, 2018**

**Venue: c/o JSI & SNSA Ljubljana Slovenia**

**Tutoring Coordinator: Mr. Luka Snoj (JSI), email: luka.snoj@ijs.si;**

**Introduction**

The tutoring activity has been conceived as “on the job training” in the area of safety and oversight of Research Reactors. It will contribute to a concrete and practical “build-up” of knowledge allowing a sustainable transfer of approaches and methods being implemented at the premises of the Slovenian Nuclear Safety Administration (SNSA) and the Jožef Stefan Institute (JSI). The tutoring module is organized for the duration of 8 weeks months for 2 tutees, who previously took part in a one week training on the same topic held in December October 1-5, 2018 at JSI in Ljubljana.

**Tutoring objective, content and expected achievements**

Objective of the tutoring will be to ensure an optimum of transfer of know-how and develop capability in understanding the operational and safety aspects of a RR, related safety and licensing requirements, content of SAR and regulatory oversight activity, use and application of RR.



In particular the following content and aspects will be covered:

- RR reactor safety conception
- RR SAR
- Regulatory licensing of RR
- Regulatory inspection of RR
- RR safe operation
- RR use for personnel training
- RR use in support to NPP
- Periodical safety review of RR
- Safety assessment, safety analysis
- Categorization of modifications
- PSA for RR
- RR operation and safe utilization
- Radiological monitoring
- Emergency preparedness
- RR Decommissioning
- Slovenian and international requirements
- The tutoring will include also onsite visits.

The expected achievements are focused on tutees' consolidated knowledge of the safe operation of RR and of the regulatory review and oversight function for RR with direct evidence of the regulatory approach for resolution of current safety issues.

**Tutoring Module on  
“Safety evaluation, licensing and oversight of Research Reactors (RR)”  
Tutoring Program**

Programme at the JSI	Tutors
<b>1st Week</b>	
<ul style="list-style-type: none"> <li>▪ Introduction:               <ul style="list-style-type: none"> <li>○ Introduce working place, documentation and equipment</li> <li>○ Present tutoring program, work plan, goals of work and final report</li> </ul> </li> <li>▪ Review input data               <ul style="list-style-type: none"> <li>○ Safety Analysis Report</li> <li>○ Slovenian regulation</li> <li>○ IAEA safety standards for RR</li> </ul> </li> </ul>	Luka Snoj Anže Jazbec Borut Smodiš
<b>2nd Week</b>	
<ul style="list-style-type: none"> <li>▪ RR operation and safe utilization (hands on)</li> <li>▪ Safety assessment, safety analysis, categorization of modifications (prepare Safety Analysis and Safety Evaluation Report for modification of control rod mechanisms and installation of water leakage detection system)</li> <li>▪ Use of Graded approach in safety assessment of modifications</li> </ul>	Luka Snoj Anže Jazbec
<b>3rd Week</b>	
<ul style="list-style-type: none"> <li>▪ Safety Classifications of SSC and requirements for redundancy, independence, diversity (practical work on safety classification of SSC for the TRIGA Mark II reactor)</li> <li>▪ safety assessment and categorization</li> <li>▪ safety classification of SSC</li> </ul>	Luka Snoj Anže Jazbec
<b>4th Week</b>	
<ul style="list-style-type: none"> <li>▪ Core analysis and instrumentation for Research Reactors (hands-on)</li> <li>▪ performing Periodical safety review action plan of RR</li> </ul>	Luka Snoj Anže Jazbec
<b>5th Week</b>	
<ul style="list-style-type: none"> <li>▪ RR operation and safe utilization (hands on) role of RR to support NPP operation, training of personnel, etc. (TBC)</li> </ul>	Luka Snoj Anže Jazbec
<b>6th Week</b>	
<ul style="list-style-type: none"> <li>▪ review of the work performed</li> <li>▪ write a report on the work performed</li> </ul>	Luka Snoj

<b>Programme at the SNSA</b>	
<b>1st Week</b>	
<ul style="list-style-type: none"> <li>- Introduction of SNSA               <ul style="list-style-type: none"> <li>* About SNSA and its organization,</li> </ul> </li> <li>- EU nuclear safety legal framework (Euratom Treaty, Directives, Regulations)</li> <li>- Joint Convention – reporting about RR</li> <li>- Slovenian legislation with emphasis on the RR               <ul style="list-style-type: none"> <li>* Rules JV5 (Rules on radiation and nuclear safety factors)</li> <li>* Rules JV9 (Rules on operational safety of radiation or nuclear facilities)</li> <li>* Rules JV7 (Rules on radioactive waste and spent fuel management)</li> </ul> </li> <li>- Licensing process, basic licensing principles – for RR               <ul style="list-style-type: none"> <li>* Basics of the licensing process including RR and comparison of requirements for RR and those for power reactors</li> </ul> </li> <li>- Safety Assessment and licensing decision</li> <li>- PSA for RR and international missions</li> <li>- Physical Protection               <ul style="list-style-type: none"> <li>* Physical Protection Basics with application to RR</li> </ul> </li> <li>- Emergency Preparedness</li> </ul>	<p>Tomaž Nemec Andreja Peršič</p>
<b>2nd Week</b>	
<ul style="list-style-type: none"> <li>- Modifications (how to evaluate them, review of examples of some typical and some current modifications)               <ul style="list-style-type: none"> <li>* Some examples of RR modifications, trainees will try to do review and evaluation by themselves</li> </ul> </li> <li>- SAR               <ul style="list-style-type: none"> <li>* Legal requirements (structure and relevant chapters of SAR)</li> </ul> </li> <li>- Maintaining safety of RR in the future               <ul style="list-style-type: none"> <li>* Future modifications</li> </ul> </li> <li>- Environmental monitoring around RR (requirements and results) including JV 10 (Rules on radioactivity monitoring)</li> <li>- Fire Protection</li> <li>- Radiation sources management (isotope production, samples)</li> <li>- Inspection               <ul style="list-style-type: none"> <li>* Inspection programme, methods, findings, reports evaluations, events – for RR</li> </ul> </li> <li>- Licensing of Reactor Operators</li> <li>- Decommissioning               <ul style="list-style-type: none"> <li>* Current decommissioning plan and its characteristics</li> </ul> </li> </ul>	<p>Tomaž Nemec Andreja Peršič</p>



At the end of the Tutoring Module the Tutees will elaborate a common Report containing the following:

- **INTRODUCTION**
- **TUTORING OBJECTIVE**
- **TUTORING PROGRAM**
- **ACTIVITIES PERFORMED**
- **MAIN RESULTS**
- **CONCLUSIONS**

The Tutees Report will be agreed with the tutoring coordinator before official submission to the EC Project Manager.

-----