Using Nuclear Techniques for the Characterization and Preservation of Cultural Heritage Artefacts in the Europe region

Regional Training Course on “Demonstration of Techniques for Cultural Heritage Protection”

9 – 13 May 2011

Magurele, Romania
IAEA TEAM

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PURPOSE OF THE RTC

• To provide technical knowledge and skills on:
  • the principles,
  • current methodologies,
  • advantages and limitations

Radiation Processing Technology for preservation of cultural heritage artefacts
Expected outputs

- Increased knowledge and practical skills in the use of radiation processing technology to disinfect and preserve the cultural objects artefacts.

- Increased knowledge on the parameters for process control.

- Participants capable of conducting irradiation experiments at their home laboratories according to best practices.

- Collaboration with end-user!!!!!!!!!
  To Promote the utilization of nuclear techniques
IAEA activities in Radiation Processing Technology
IAEA - ‘Atoms for Peace’

IAEA Organization

3 Pillars: Science & Technology; Safety & Security; Safeguards & Verification

6 Departments: MT, NA, NE, NS, SG, TC


Safeguards and Verification: inspectors verify that safeguarded nuclear material and activities are not used for military purposes.

Science and Technology: food, health, water, and environmental areas where nuclear and radiation technologies can make a difference.

IAEA
Atoms for Peace: The First Half Century
The IAEA as a facilitator:

- PROVIDE FORUM FOR CO-OPERATIVE RESEARCH
- COLLECT, VALIDATE, DISSEMINATE RELEVANT TECHNICAL INFORMATION
- SUPPORT DOCUMENTATION AND INFORMATION EXCHANGE
- PROVIDE TECHNICAL ASSISTANCE TO DEVELOPING MS
IAEA Activities – Major Channels of Functioning - Types & Purpose

Technical Co-operation Projects (TC)

- Technology transfer and adoption;
- Part of MS development initiative;
- Shared goals and resources towards:

  - Infrastructure establishment or upgrading,
  - Specific technology implementation,
  - TC Regional Projects - Cooperation/Agreement:
    - Regional Training Programmes,
    - Regional Workshops.
The TC Programme comprises:

- National Projects (also known as country projects)
- Regional projects
- Interregional projects

Projects may comprise one or more of the following components:
- experts, equipment and materials,
- fellowships and scientific visits,
- training courses, meetings/workshops and
- sub-contracts.
Radiation Processing aspects addressed by the IAEA units

- Fostering radiation processing technology development and their applications and facilitating adaptation: NA – NAPC

- Radiation treatment aspects of food and agricultural products: NA – NAFA

- Safety and security of radiation sources: NS - NSRW & NSNS

- Management of spent sources: NE – NEFW

- Technology transfer in the above areas: TC
Technical Publications
http://www-naweb.iaea.org/napc/iachem/publications.html

Radiation Processing: Environmental Applications (2007)
IAEA – non-serial publications

Trends in Radiation Sterilization of Health Care Products (2008)

Remediation of polluted waters and wastewater by radiation processing - TECDOC

Directory of Gamma Processing Facilities in Member States

Directory of Electron Beam Processing Facilities in Member States


Industrial Electron Beam Processing (draft document ready) – in cooperation with iiA

Guidelines for QA/QC in Radiation Processing of Materials - (in preparation)
Events with the cooperation of the IAEA:

- International Meeting on Radiation Processing
- Tihany Symposium on Radiation Chemistry
- IraP-International Symposium on Ionizing Radiation and Polymers
- RadTech - International Conference on Radiation Curing
RER 8015 - Background and Strategy

- Build on successful results of RER1006 Nuclear Techniques for the Protection of Cultural Heritage Artefacts in the Mediterranean Region
- Extension from Mediterranean to Europe region
- Enhance the established network of conservators & nuclear scientists & international partners
- Focus on characterization & preservation of CH
- Continue to use the best mix of implementation modalities
- Promote the utilization of nuclear techniques
**Objective**

| Improve characterization & preservation of CH artefacts through the application of nuclear techniques with special emphasis on **gamma irradiation treatment**, making use of techniques including insect eradication and disinfection in various CH materials and consolidation of degraded materials by radiation-curing resins |
### Outcome

1. **Increase awareness and acceptance of nuclear techniques for characterization and preservation of CH artefacts**

2. **Optimize methodologies and techniques for characterization and preservation of CH artefacts**

3. **Strengthen national & regional network among conservators and nuclear institutes**
## Expected Outputs (Outcome 1)

<table>
<thead>
<tr>
<th>Output 1 (awareness and acceptance of NAT)</th>
<th>1.1 The inventory of data for characterization and preservation of CH artefacts established</th>
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<tr>
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<td>1.2 Information materials on nuclear technique capabilities for characterization and preservation of CH artefacts developed</td>
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<td>1.3 Awareness at national level increased</td>
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<td>1.4 Regional awareness increased</td>
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<tr>
<td>Output 2</td>
<td>2.1 Irradiation effects (side effects) on various materials of CH including artificial ageing of irradiated materials, and consolidation process for conservation of degraded materials and its long term behaviour evaluated</td>
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<td>2.2 Knowledge transferred and Human Resource (HR) capacity enhanced</td>
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## Expected Outputs (Outcome 3)

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<th>Output 3</th>
<th>3.1 Project planning and timely assessment of progress and results conducted</th>
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<tr>
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<td>3.2 Bilateral collaboration and cooperation among participating countries enhanced</td>
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<td>3.3 The results of the project and effectiveness of the nuclear techniques for CH protection applied</td>
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List of Activities (Awareness Raising)

- Inventory of data formulation
- Develop information materials
- National Workshops
- Regional Workshop for conservators
List of Activities (Optimization)

- Optimization exercise
- RTCs on demonstration of techniques
- Formulation of guidelines on irradiation treatment
List of Activities (Network)

- Project Coordination Meetings
- Bilateral Collaboration
- Consolidation of results and publish materials
- Participation in key international conferences
Inputs

- Meetings
- Regional Training
- Workshops (Regional and National)
- Service contract (expert, publication etc.)
- Expert Missions
- Scientific Visits/Fellowship
- Limited procurement (Cost-sharing)
Thank very much you for your kind attention!
## Proposed Budget

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<tr>
<th>Year</th>
<th>Amount</th>
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<tr>
<td>2009(Core)</td>
<td>$190,400</td>
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<tr>
<td>2010(Core)</td>
<td>$140,350</td>
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<tr>
<td>2011(Core)</td>
<td>$154,225</td>
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<td><strong>Total (Core)</strong></td>
<td><strong>$484,975</strong></td>
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