

PAUL SCHERRER INSTITUT



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WP3: Target Preparation for Improvement of Nuclear Data Measurements

SANDA Kickoff meeting, 9.-10.9.2019

Objectives and focus of WP3

Task 3.1: Intensification of the “producer – user – interaction”

Task coordinator: PSI, partners: JRC

Task 3.2: Fostering the network of target makers

Task coordinator: JRC, partners: PSI

Task 3.3: Target production

Task coordinator: JRC, partners: PSI

Task 3.4: Development of an isotope separator

Task coordinator: PSI, partners: UMAINZ, ILL

| Partner number and short name | WP3 effort |
|-------------------------------|--------------|
| 13 - JRC | 15.20 |
| 21 - PSI | 27.00 |
| 28 - UMAINZ | 24.00 |
| Total | 66.20 |

Task 3.1: Intensification of the “producer – user – interaction”

Workshops

Inviting potential target users to discuss the boundary conditions for their specific experiments

Teaching potential users that:

- The success of their experiment depends on the quality of the target
- The preparation of high-quality targets takes time
- A budget for target preparation should be foreseen in any proposal
- Radioactive targets require special care and additional money concerning transport, storage and waste disposal

Former events: ERAWAST I (2006), ERAWAST II (2011) as well as the CHANDA workshop (2015)

Next workshop tentatively planned for spring 2020; second one in 2022

Bilateral meetings producer - user

Detailed discussions on specific experiments

User contacts producer; parts of the travel costs will be covered

| 21 PSI | Cost (€) | Justification |
|--------------------------|----------|--|
| Travel | 22500 | Support for the travel of participants in the meetings for the targets producer coordination in WP3, 20 person*trips at 1000 euros each plus 5 person*trips at 500 euros each. |
| Equipment | | |
| Other goods and services | 2500 | For certificate of financial statement |
| Total | 25000 | |

Task 3.2: Fostering the network of target makers

- Main collaborators at present: Jyväskylä, GSI, GANIL, Uni Warshaw, IPNO, IFIN-HH, Uni Mainz; look for new partners in Europe
- Extend the network to facilities outside Europe (Oakridge; Argonne, Capetown)
- Use synergies with existing platforms (INTDS):
next conference: **INTDS2020 20.-25.9.2020 at PSI**
- Establish a joint database of target preparation facilities and enriched isotope suppliers
- Support education of young researchers (short and longer-term visits)
Equipment sharing
- Knowledge exchange (workshops, meetings)

| 13 JRC | Cost (€) | Justification |
|---------------------------------|----------|--|
| Travel | 29000 | 4000 for travels to meetings, 4 person*trips at 1000 euros each, of the project plus 25000 to support for the travel of participants in the meetings for the targets producer-user interaction in WP3, 25 person*trips at 1000 euros each. |
| Equipment | | |
| Other goods and services | 27000 | 2000 for the organization of a workshop and 25000 for the support to the E&T course |
| Total | 56000 | |

Task 3.3: Target production

A limited number of targets can be produced according to requests from collaboration members.

Both PSI and JRC will be responsible for the manufacturing of the final target. The target manufacturer will be in close contact concerning the special requirements of the envisaged experiment using the possibilities of user-producer interaction provided in the frame of task 3.1.

Resources will be allocated according to the effort. Target requests can be submitted to the TP task leader. Both requests related to energy (minor actinides, ^{233}U , ^{239}Pu or fission products like ^{79}Se) and non-energy applications (for instance ^{179}Ta) will be considered. Each target request will be evaluated on the basis of the relevance of the target and the possibilities of the TP facilities.

During the first 12 months of the project, target request from collaborators will be collected and evaluated. As an essential milestone, the decision on which targets can be manufactured will be made after this time span.

Total budget 150 k€ (75 k€ JRC, 75 k€ PSI)

Task 3.4: Development of an isotope separator

Production of isotopically pure targets by dedicated mass separation

Exploration of innovative efficient and selective ionization procedures

Applications: cross section measurements for

- Nuclear-energy related isotopes
- Nuclear astrophysics

2 subtasks:

| | | |
|---|---|--------|
| Site preparation in Hotlab of PSI | - | PSI |
| Design development of the machinery for specific applications | - | UMAINZ |

Total budget: 245 k€ (160 k€ UMAINZ, 65 k€ PSI, 20 k€ ILL - subcontract)

Deliverables and Milestones

| Deliverable Number ¹⁴ | Deliverable Title | Lead beneficiary | Type ¹⁵ | Dissemination level ¹⁶ | Due Date (in months) ¹⁷ |
|----------------------------------|---|------------------|--------------------|-----------------------------------|------------------------------------|
| D3.1 | Report on the meetings performed in the frame of (“Producer – user – interaction”) | 21 - PSI | Report | Public | 36 |
| D3.2 | Report on the meetings performed in the frame of “Network of target producers” | 13 - JRC | Report | Public | 42 |
| D3.3 | Report on produced targets | 13 - JRC | Report | Public | 30 |
| D3.4 | Documentation of the design of a mass separation tool for target preparation | 28 - UMAINZ | Report | Public | 48 |
| D3.5 | Documentation of the site specification for installation of a mass separator in the Hotlab of PSI | 21 - PSI | Report | Public | 36 |

Milestones:

| | | |
|--|-----|---------------|
| MS27 Scheduling regular user – producer meetings | PSI | February 2020 |
| MS28 Scheduling regular target - maker meetings | JRC | February 2020 |
| MS29 Decision on targets to be manufactured | JRC | February 2021 |