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# Carbon-14 Source Term

## CAST



## Deliverable Title (D7.20)

**Author(s):**

**E.A.C. Neeft**

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## **CAST – Project Overview**

The CAST project (CARbon-14 Source Term) aims to develop understanding of the potential release mechanisms of carbon-14 from radioactive waste materials under conditions relevant to waste packaging and disposal to underground geological disposal facilities. The project focuses on the release of carbon-14 as dissolved and gaseous species from irradiated metals (steels, Zircalloys), irradiated graphite and from ion-exchange materials as dissolved and gaseous species.

The CAST consortium brings together 33 partners with a range of skills and competencies in the management of radioactive wastes containing carbon-14, geological disposal research, safety case development and experimental work on gas generation. The consortium consists of national waste management organisations, research institutes, universities and commercial organisations.

The objectives of the CAST project are to gain new scientific understanding of the rate of re-lease of carbon-14 from the corrosion of irradiated steels and Zircalloys and from the leaching of ion-exchange resins and irradiated graphites under geological disposal conditions, its speciation and how these relate to carbon-14 inventory and aqueous conditions. These results will be evaluated in the context of national safety assessments and disseminated to interested stakeholders. The new understanding should be of relevance to national safety assessment stakeholders and will also provide an opportunity for training for early career researchers.

For more information, please visit the CAST website at:

<http://www.projectcast.eu>



*CAST*  
*Workshop 2 (D7.20)*

<b>CAST</b>		
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## **Executive Summary**

This report aims to document the initiation of the second CAST workshop, to demonstrate to the European Commission that the milestone MS14 has been achieved.



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## 1 Preparation

### 1.1 Audience

The audience of this workshop are professionals working at organisations with responsibilities in the management of radioactive waste [Neeft et al, 2015], for example:

- 1) Waste generators and waste producers;
- 2) Regulators;
- 3) Waste management organisations.

These organisations are located in the European Union and other countries with organisations participating in CAST: Switzerland, Japan and Ukraine. For each country, for each organisation, one person was invited to participate in the workshop. The same participants for the first workshop were personally invited for the second CAST workshop. For some potential participants, the invitation included a description that budget was available to reimburse travel costs. The aims of the first workshop were [Neeft et al, 2015]:

- 1) To present the results obtained;
- 2) To discuss the outcomes with the regulators, waste management organisations and waste producers.

The second workshop takes place in Lyon at IBIS hotel near the Institute de Physique Nucleaire because the obtained results are presented there in the CAST Final symposium.

### 1.2 Documents

The documents intended to be prepared for the second workshop were:

- 1) An announcement documentation (D7.18);
- 2) Overview of achievements for regulators (D7.16).

### 1.2.1 Announcement

The announcement documentation was in a similar layout as the Newsletter in order to be attractive as well as informative. There was:

- 1) An A4 sized front with a short introduction of CAST and why persons from the three organisations have been invited;
- 2) An A3 sized overview of the origin of waste in a nuclear plant with photographs of microscopic of the waste investigated in CAST with details of technical achievements;
- 3) An A4 sized back with the agenda.

### 1.2.2 Documentation for regulators

The document written for regulators comprised - as requested by this group in the first workshop - carbon-14 generation in a nuclear reactor for bounding the carbon-14 inventory, representativeness of samples investigated in CAST and the knowledge available of carbon-14 entering the biosphere although the biosphere is outside the scope of Carbon-14 Source Term. The possibilities of bounding the carbon-14 inventory, the presence of nitrogen, potential release mechanism, potential speciation and source term was described for each type of waste investigated in CAST. The carbon-14 activity concentration for the samples investigated CAST, this activity concentration as reported by WMO in CAST as well as presented in the first workshop was written in the overview for each type of waste investigated in CAST in order to show the representativeness of the samples investigated in CAST [Neeft et al, 2017].

## 2 Workshop held

The workshop was held on 18<sup>th</sup> January 2018 after the CAST Final Symposium. The participation of the waste generators / producers in the first workshop was limited to three countries. The details expected to be presented by this group were presented by the WMO's. All presenters confirmed that their presentations could be used for the workshop proceedings.

## 3 Proceedings

The proceedings of the CAST workshop comprised the background and objectives of the second workshop, the hand-outs of the presentations and a description of the discussion [Buckau, 2018].

## References

Buckau G, Neeft EAC, Workshop 2 Proceedings (D 7.21) CAST report (2018).

Neeft, CAST Workshop 1 Announcement (D7.18), CAST leaflet (2017).

Neeft EAC, Narkuniene A, Montaya V, Buckau G, Dissemination plan (D7.3) CAST report (2015).

Neeft EAC, Grigaliuniene D, Overview of achievements on technical results for regulators for Workshop 2 (D7.16), CAST report (2017).