This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 662287.

EJP-CONCERT

European Joint Programme for the Integration of Radiation Protection Research

H2020 – 662287

D 1.4 – Summary report of the activities carried out during the ongoing reporting period and the Annual work plan for the next year of CONCERT

Lead Author(s): CONCERT co-ordinator, WP leaders and WP9 project coordinators

With contributions from: all consortium members

Reviewer(s): CONCERT coordination team

Work package / Task	**WP 1**	**T**
Deliverable nature:	**Report**	
Dissemination level: (Confidentiality)	**Public**	
Contractual delivery date:	**Month 45**	
Actual delivery date:	**Month 45**	
Version:	**1**	
Total number of pages:	**118**	
Keywords:	**summary report for the ongoing reporting period; Annual Work plan for the 5th year**	
Approved by the coordinator:	**Month 45**	
Submitted to EC by the coordinator:	**Month 45**	

CONTENT

SUMMARY REPORT FOR THE ONGOING REPORTING PERIOD (M37-M45)

Publishable summary

This document is the "D1.4-Fourth periodic report and draft annual work plan to the EC in accordance with the provisions of the consortium contract" and describes in part one the work carried out by CONCERT from June 2018 until February 2019 and in part two the work planned for the final (5th) CONCERT year, i.e. from June 2019 until May 2020. CONCERT achieved its objectives for the fourth year as laid down in the AWP for the fourth year.

During the fourth year of the project, efforts have been devoted to the addition of five LTPs resulting of the second open RTD call of the CONCERT EJP and to keep track of tasks and project work and measure progress against predefined goals.

Work package 1 of CONCERT provides the financial, consortium and project management. The work carried out is result-oriented, aims at an efficient management of the project and quality control of results and deliverables as well as timely communication with the European Commission.
Through intensive collaboration with the nine CONCERT project-coordinators CONCERT ensures the smooth running of all CONCERT funded projects as well.

During the fourth year, the main activities in CONCERT **Work package 2** were to develop platform roadmaps for key research areas and to provide input and feedback to the joint roadmap. The five RP research platforms (MELODI, ALLIANCE, NERIS, EURADOS and EURAMED) are now well established and organised, having working groups for SRA development, infrastructures and E&T activities. The SRA working groups / RTD Committees nominated by the platforms identified areas of research that have not fully been covered in the past. This gap analysis was openly communicated to the European research community before the NFRP2018 call. The SRA for social sciences and humanities was published and the SSH community has plans to set up an association. The work on long-term roadmaps of MELODI, ALLIANCE, NERIS and EURADOS has been carried out in parallel of the scenario-based joint roadmaps. Workshops on roadmaps for specific topics have been co-organised by the platforms and CONCERT and discussed during the European Radiation Protection Research Week in Rovinj, Croatia 1-5 October 2018. Dissemination of the European radiation protection SRAs in global level has taken place in e.g. ICRP and OECD meetings.

CONCERT **Work package 3** focused in the previous years on the formulation of joint priorities for the 2 CONCERT research calls, a joint gap analysis of the EURATOM NFRP-2018-08 call, and the development of a draft joint roadmap for radiation protection research. In the fourth year, consultation on the joint roadmap was performed in various stakeholder settings. In the 5th year, the activities of WP3 will update the joint roadmap for radiation protection research, based on results of the consultations of Programme Owners, Programme Managers and Linked Third Parties, including the collection of information on national resources to fund research tackling the research challenges of the joint roadmap over the long-term, and the stakeholder group of WP5. The joint roadmap should provide the necessary information to enable the development of a long-term call plan, to enable research of high impact. Efforts will be done to align the joint and individual roadmaps.

Within this reporting period, **Work package 4** was in charge of the follow-up of the nine research projects funded in the two CONCERT calls (three projects in call 1 and six projects in call 2). WP4 developed four different templates for the scientific reporting: one midterm report and one final report for each call, adapted

to the respective topics and conditions. The collection of the mid-term scientific reports was started and will be completed in March 2019.
WP4, in collaboration with the coordination team, started the organisation of the final evaluation of the nine projects funded by CONCERT at the end of the funding period, beginning of 2020.

CONCERT **Work package 5** concerns stakeholder engagement activities. In this reporting period, there have been three significant achievements: (i) Holding the second and third Stakeholder Group meetings (Antwerp, 15 June 2018 and Rovinj, 5 October, 2018), (ii) analysis of responses to the CONCERT stakeholder survey and drafting of a detailed report, and (iii) Revision of information on radiation exposure and risk to the CONCERT website (see http://www.concert-h2020.eu/en/Stakeholders) intended to inform public stakeholders.

In the fourth year, **Work package 6** partners have kept the same objectives according to increase the visibility and use of key research infrastructures: (i) to develop a list of suitable infrastructures and to compile it in a database (ii) to prepare regular information about infrastructures, (iii) to develop actions to strengthen and expand databases from past radiobiological experiments and from stored biological material in STORE, (iv) to facilitate access to infrastructures.

Work package 7 of CONCERT is dedicated to education and training (E&T) for the development and maintenance of the expertise and competence of the community of research scientists working in the area of radiation protection research. The specific activities organised by the work package, and funded as integration activities, included: a) Setting up a programme of student travel grants to allow students to attend relevant training courses at other institutions, or attend conferences to present their work and b) Launching a call for short courses in topics important for radiation protection research, aimed particularly at students entering the field or young researchers.
As well as these initiatives, WP7 is holding an annual Forum in association with the European Radiation Protection Week (ERPW), to strengthen the integration of E&T institutions within radiation protection. WP7 contributed to WP2 and WP3 to promote the integration of E&T into research projects funding under the two CONCERT calls.

Work package 9 of CONCERT brings together RTD activities selected through two open calls for research projects launched by the CONCERT EJP in 2016 and 2017. In this reporting period, all nine selected projects have continued to perform the scientific work needed to reach the fixed goals.
At the ERPW2018 in Rovinj, Croatia 1-5 October 2018, CONCERT organised an entire day to give the projects a platform to present the results achieved so far to the scientific community

Following the summary progress report of work per Work package carried out since 1st June 2018.

WP1 - Project coordination & management

Work carried out

The purpose of WP1 is to ensure the smooth and effective administrative and financial management of the project as well as reaching a good synergy between all partners. The overall objective of the managerial organisation is to provide necessary structures for participatory and efficient decision-making and coordination of activities, fluent day-to-day management, reporting to EC and supporting project activities respectively. Additionally WP1 is in intensive collaboration with the project coordinators in order to maintain continual supervision of funded projects to check their progress and to facilitate beneficiaries especially in view of financial assistance, project workflow and reporting.

The tasks of **Work package 1** have been implemented successfully. The project is on track and all the activities that were envisaged for the fourth year have been accomplished so far.

Task 1.1 – Overall legal, contractual, administrative management and financial management (BfS)
Planning and Co-ordination is led by the Executive Board (ExB) which is composed of WP leaders and is chaired by the coordinator. The ExB is responsible for aligning work across all WPs and through a continuous assessment of inputs and emerging results, make strategic implementation proposals to the Management Board (MB) that is composed of all beneficiaries, and the five research platforms MELODI, ALLIANCE, NERIS, EURADOS and EURAMED. Latter one was added successfully beginning of June2018.

The following responsibilities have been allocated:

- Project coordinator: is responsible for the overall coordination of the project and for chairing ExB and MB as well as coordinating any issues with the EC.
- Project coordination team: is responsible for the daily management of the project including administrative and financial issues.
- WP and Task Leaders: are responsible for leading the work package/task according to the objective and description of work
- Project coordinators of funded projects: are responsible for the overall coordination of the respective and receive the necessary support of the CONCERT coordination team

The project coordination team answered numerous requests and prepared the necessary amendment (AMD-662287-105) to the GA of CONCERT.

Task 1.2 – Consortium, Executive and Management Board
Project meetings. During the fourth year, the following meetings were organised:

- Management Board meeting organised as a whole day meeting during the European Radiation Protection Research Week in Rovinj, Croatia 1-5 October 2018
    - CONCERT had scheduled its MB meeting for the whole day on 4th Oct 2018 starting at 8am until 6pm. It started with presentations of results/achievements and future perspectives by the coordinators of all nine CONCERT funded projects. Following the ExB gave reports about the workpackage achievements and future tasks

- a member of the ESAB (Executive Scientific Advisory Board) attended the MB meeting during the European Radiation Protection Research Week in Rovinj, Croatia 1-5 October 2018

- Each Work Package organised its own meetings as necessary.

Meeting agenda and information on the venue were shared. Meeting minutes were prepared by the project coordination team and made available on the project workspace together with the lists of participants. During the meetings, partners reviewed the latest results and achievements of the different Work packages and funded projects respectively.

Task 1.3 – Updating the rolling annual work plan (AWP)
Work on the AWP for the fifth year of CONCERT (M49-60) was co-ordinated by BfS and the 5th AWP submitted as part two of this document.

Task 1.4 – External Scientific Advisory Board (ESAB) for the evaluation of CONCERT
A member of the ESAB attended the MB European Radiation Protection Research Week in Rovinj, Croatia 1-5 October 2018 to get information about the CONCERT process as well as an overview of activities by the nine projects funded through the two CONCERT Calls.

Task 1.5 – Negotiation of projects to be funded through open RTD calls
Within CONCERT, two major open RTD calls have been launched in 2016 and 2017, to support innovative research projects in radioprotection. Universities and research institutes from all over Europe and beyond had the opportunity to join research consortia and submit proposals. Comprising both CONCERT calls, 37 proposals have been submitted with nine projects funded in total.
The CONCERT partners have demonstrated with both open calls their wish to foster broad, international collaboration. This goal has been successfully achieved.
For more information please refer to the newly introduced deliverable 4.9. This document aims to summarise the outcome of both open transnational calls of the European Joint Program CONCERT to fund multidisciplinary innovative research projects in radiation protection.

Task 1.6: Funding decision process for integration activities listed in the approved annual work programme
Funding decisions on integration activities were made in the field on education and training (courses and grants) based on recommendations of WP7 and financial feasibility checks by WP1 by the CONCERT MB.

Task 1.7: Attracting new members to the CONCERT EJP Consortium
The aim of this task is to extend CONCERT's scope and its co-fund capability. Adding beneficiaries will be to the mutual benefit of the current consortium and the joining institutions and foster the integration of radiation protection research in Europe.
The following beneficiaries were successfully added to the consortium end May/beginning June 2018:

- BEREDSKABSSTYRELSEN (DEMA)
- EUROPEAN ALLIANCE FOR MEDICAL RADIATION PROTECTION RESEARCH (EURAMED)

With DEMA joining CONCERT, the action extended to a country that was not represented with beneficiaries in the consortium. Having DEMA participating strengthens the integration of the respective country's research community into CONCERT's activities.

From the start of CONCERT the development of a platform for radiation protection in medicine was envisaged. EURAMED was founded successfully and joined CONCERT in 2018.

With EURAMED joining the consortium, CONCERT unites the necessary scientific expertise from the fields of e.g. radiobiology, biophysics, radioecology, dosimetry and medicine among other things at the European level and integrates them into joint research. This is based on the current strategic research programmes of the five European research platforms MELODI (radiation effects and risks in the low dose range), ALLIANCE (radioecology), NERIS (nuclear and radiological emergency preparedness), EURADOS (dosimetry) and EURAMED (radiation protection in medicine).

Task 1.8: Public CONCERT web page and a secure internal web-based workspace
The secure internal web-based workspace integrated with the project's public website to provide a medium for communication among project participants is maintained and looked after by SCK-CEN. The workspace allows the exchange of various types of information: datasets, results, coordination decisions, timetables, presentations, meeting agendas and minutes, and reporting among partners. It allows each partner, the work packages leaders, and the coordinator to regularly monitor progress in data collation, analysis, and accomplished deliverables.
The public website is designed to act as an information hub about the objectives, activities and results of CONCERT and serves as a prime public dissemination tool making available the project published materials. The website is being updated on a regular basis to keep the audience informed and ensure continued interest of already attracted visitors. In collaboration with WP5, information of interest to the public on radiation protection was collected (http://www.concert-h2020.eu/en/Stakeholders) and will be further elaborated during the course of CONCERT.

Task 1.9: Establishment of an expert database for the reviewing processes of CONCERT
The expert database has been set up as planned in year one. Experts from all over the world were proposed by the radiation protection research platforms and were contacted by the coordinator to inquire their willingness to serve as expert in the CONCERT call evaluation. The expert database was provided to WP4 to be used during the two CONCERT call evaluation processes.

Milestones and Deliverables

D1.4 Fourth summary progress report and draft annual work plan to the EC in accordance with the provisions of the consortium contract

WP2 – Integration and SRA development in radiation protection research

Work carried out

The main WP2 objectives for the fourth project year are:

- To provide input to Joint Programming (WP3) from all fields covered by WP2.
- To successfully complete the work for the preparation of the SRA on social sciences and humanities
- To find the best possible ways to implement the BSS in Member States.
- To develop roadmaps for research based on the SRAs

There are now five RP research platforms (MELODI, ALLIANCE, NERIS, EURADOS and EURAMED), all well established and organised, having working groups for SRA development, infrastructures and E&T activities. The SRA working groups / RTD Committees nominated by the platforms developed SRA Statements on current research needs, and identified research priorities.

The work on long-term roadmaps of MELODI, ALLIANCE, NERIS and EURADOS has been carried out in parallel of the scenario-based joint roadmaps. Workshops on roadmaps for specific topics have been co-organised by the platforms and CONCERT and discussed during the European Radiation Protection Research Week in Rovinj, Croatia 1-5 October 2018.In the global level, dissemination of the European radiation protection SRAs has taken place in e.g. ICRP Committee meetings, OECD meetings and Radiation Research Society meeting.

Task 2.1 (MELODI) A joint MELODI-CONCERT workshop on individual radiosensitivity and radiosusceptibility was organised in Malta in March 2018 and the main conclusions were reported in the ERPW2018 in Rovinj. Based on the workshop outcome, a set of review papers on state-of-the-art of research and recommendations for future research on epidemiology, biological mechanisms, potential screening assays and ethical issues has been prepared, with the objective to publish them in Special Issue of International Journal of Radiation Biology during 2019. The impact of draft joint roadmap scenarios on MELODI SRA was evaluated by MELODI Executive Council and SRA working group (a letter sent to WP3 leader).

Task 2.2: ALLIANCE organised with MELODI representatives a workshop on the topic of "Epigenetic factors and long-term effects of ionizing radiation on organisms" (4-6 April 2018, hosted by IRSN in Fontenay aux Roses). This event was mainly managed by the ALLIANCE topical roadmap WG on "Transgenerational effects and species radiosensitivity" which prepared a position paper on this issue following activities during the COMET EC-funded project: "Current evidence for a role of epigenetic mechanisms in response to ionizing radiation in an ecotoxicological context" recently submitted to the Journal "Environmental Pollution". Since January 2019, the ALLIANCE SRA/global roadmap WG has started the brainstorming exercise regarding the radioecology SRA update.
The current full version is the one released in 2014 after incorporation of more than 100 comments from a wide panel of stakeholders. The updated version, prepared for November 2019, will be consistent with the radiation protection R&D challenges as expressed in the joint roadmap from CONCERT, alongside recommendations from the ALLIANCE External Scientific Advisory Board (ESAB) as reported in CONCERT D2.5. This new version will also be consistent with the SRA annual statements produced in 2015, 2016, 2017 on behalf the ALLIANCE under CONCERT and with the gaps analysis elaborated in 2018. This update will examine new drivers of the radioecology SRA since the 2014 publication and new research topics to be covered by the SRA, according to the needs expressed by the five topical roadmaps WGs - Marine radioecology, Human food chain modelling, Naturally Occurring Radioactive Materials (NORM) Radioecology, Transgenerational effects and species radiosensitivity, Atmospheric dispersion and transfer processes. To help the identification of new research lines and new drivers, ALLIANCE is planning to held a suite of workshops in 2019 (up to one per topical roadmap and one to consolidate collectively the SRA update, the latter being organised during the ERPW 2019 in Stockholm).

Task 2.3: During its 4th Workshop, organised in Dublin on April 25-27, 2018, **NERIS** organised a round table involving the European and International organisations (IAEA, ICRP, NEA-OECD, EC-JRC, HERCA), asking them to provide comments and feedbacks on the NERIS SRA and NERIS Roadmap adopted in 2017. At the occasion of this workshop, NERIS also organised a round table with the other European Platforms in order to address the way forward with the CONCERT Roadmap. Among the interaction, NERIS participated to the meeting organised by NEA-OECD in Milan on 17-18 September 2018 and contributed to the ICRP SLO meeting in Stockholm on 17-18 October 2018.
In April 2019, at the occasion of its 5th workshop, a meeting of the R&D Committee will be organised in order to review the NERIS SRA and Roadmap taking into account the recent research developments and feedbacks provided by the different stakeholders. As a result of this meeting, a way forward for updating these documents will be discussed and endorsed by the General Assembly. In this perspective, a dedicated meeting of the NERIS R&D Committee will be organised during the ERPW 2019 in Stockholm in October 2019.

Task 2.4: EURADOS is progressing with the SRA update. The present SRA was published in 2014 as a EURADOS report. A preparation document was finalised, where the input of the stakeholders on the present SRA and new scientific results were summarised per challenge. A new structure of the SRA was discussed and decided upon in the EURADOS Council meeting in June in Bologna. During the Annual Meeting in Lodz in February

2019, a dedicated meeting was organised with all contributors to the new SRA to discuss the progress and the interlinking of the challenges. The new draft SRA will be available for approval by summer 2019, and should be published before the end of 2019. For each challenge of the existing SRA, an individual roadmap was developed. These individual roadmaps will be combined and used as input for the joint CONCERT roadmap.

Task 2.5: EURAMED organised a session on Artificial Intelligence (AI) at ERPW 2018 in Rovinj, Croatia. The lectures gave an introduction on machine learning and artificial intelligence and how they can be used e.g. in radiation biology or radiation protection, the use of artificial intelligence for technical radiation protection in medical imaging and an overview on radiomics. This line of research is expected to be very important in the field of medical imaging and EURAMED SRA.

Task 2.6: The work for creating a Strategic Research Agenda on **Social Sciences and Humanities (SSH)** in radiation protection (Task 2.6) was continued. The SSH community in radiation protection, is establishing a platform: European Platform for Social Sciences and Humanities (SSH) research relating to Ionizing Radiation (IR) (**SHARE** Platform) with a seat at SCK•CEN. Objectives of the CONCERT task 2.6 and the SHARE platform are complimentary, in particular to support and maintain the development of an SSH research agenda, to aim at the integration of social sciences and humanities research in the wider research endeavour, to stimulate the integration of social sciences and humanities (SSH) in research, practice and policy related to ionizing radiation.
The first version of SRA was prepared, published at the CONCERT web and accepted for publication in Journal of Radiological Protection. Additionally, a gap analysis was carried out in order to identify SSH research priorities to be addressed by projects responding to the EURATOM NFRP 2018 calls (D3.3). SSH research priorities were identified through the gap analysis. An interactive process with research community and other stakeholders for creating a strategic research agenda for social sciences in radiation protection was continuing, with face-to-face meetings (e.g. 10th of January, 2019), consultation and dissemination at different scientific and experts events (e.g. Radiation Protection Week, Conference Society for Risk Analysis, IRPA) as well as with organization of the annual RICOMET 2018 conference. Preparation of the RICOMET 2019 started.

Task 2.7 deals with communication of knowledge from research and innovation conducted within CONCERT and outside laying the scientific basis for the revised European Basic Safety Standards. Contacts with HERCA and Article 31 Group have been continued.. CONCERT members have participated HERCA workshops and workshop series organised by RISKAUDIT, discussing the challenges related to BSS transposition and implementation (risk management). A general observation is that national authorities have been heavily occupied by the legal aspects of BSS rather than research.
There will be no more RTD calls organised by CONCERT during H2020. However, research on radiation protection was addressed by the Euratom work programme 2018, pursuing the integrative approach of radiation protection research involving Member States´ organisations having a regulatory mandate for research in radiation protection and the wider scientific community. The priorisation of research in this field is reflected in the SRAs of MELODI, ALLIANCE, NERIS, EURADOS, and EURAMED. To avoid duplication with previously funded research and to serve the European research community, the platforms carried out analyses on research conducted during FP6, FP7 and H2020 in their respective fields and identified areas of research that have not fully been covered in the past. This gap analysis was openly communicated to the European research community before the NFRP-2018 call.

Milestones and Deliverables

MS12 Annual SRA platform statements 2018 was due by M 42. This milestone was reached ahead of time (M33) as the platforms published their gap analyses on research needs, prior to the call on Euratom work programme 2018.

D2.12 Revised Strategic Research Agenda for Social Sciences and Humanities in radiation protection M36 (postponed, submitted start of M38)

WP3 - Priority research and Joint programming needs in the perspective of European Integration

Work carried out

The draft joint roadmap served as a basis to collect feedback from the wider research community and other stakeholders. Stakeholder involvement along the course of the development of the joint roadmap is important, since the joint roadmap is meant to be a guide to plan research and develop radiation protection tools for the benefit of the society. Up till now feedback on the first draft joint roadmap from various Programme Owners, Programme Managers as well as some platforms were collected electronically. To this end, meetings were organised in many countries by the beneficiaries on national level to consult the main stakeholders at national / regional level.
Some meetings were also held to present the joint roadmap to various types of stakeholders within and outside Europe.
For example, the joint roadmap draft was presented at the NUGENIA annual meeting on 11/4/2018, in the technical session VII on developing a common vision towards more sustainable nuclear energy. Discussions took place with the NUGENIA roadmap Technical Area (TA) responsible for TA2 (severe accidents) and TA3 (Improved reactor operation) as well as with the main author of the NUGENIA roadmap on his experience on how to setup such an extensive multidisciplinary roadmap.
In April 2018, the WP leader was also invited to join the round table discussion on the CONCERT joint roadmap and links with NERIS activities at the 4th NERIS workshop. All common interests of the various platforms with NERIS were highlighted in this discussion.
A second meeting of the CONCERT Stakeholder Group was organised by WP5 Paris back-to back with the RICOMET workshop 2018. A detailed discussion took place regarding the formulation of the exposure scenarios and research challenges and how to improve them. At the RICOMET meeting itself, the WP leader co-chaired a session on stakeholder involvement in the development of the radiation protection research agendas and roadmaps. In this session the joint roadmap and the planned stakeholder involvement was presented, whereas EURADOS presented its practical experience in involving stakeholders in the setup of the strategic research area, Nuclear Trend Watch presented their experience as stakeholder involved in a process, and there was also a presentation on the experience on stakeholder involvement for research orientation from a TSO.
On 10 July, a second meeting with representatives of NUGENIA took place in Cadarache, France, to elucidate concrete topics in line with the joint roadmap and strategic research agendas of the platforms MELODI, EURADOS, NERIS and ALLIANCE that could lead to research projects of common interest. A list of proposals was presented to NUGENIA, and currently there are plans to organise a joint workshop in 2019 with

representatives of NUGENIA and of MELODI, EURADOS, NERIS and ALLIANCE to elaborate these topics further and to discuss potential funding mechanisms.
In August 2018 the joint roadmap was presented by the WP leader to the European Radiation Research workshop, in Pécs, Hungary, with the aim to allow researchers to provide input to the joint roadmap.
On the 5th of October 2018 the CONCERT Stakeholder Group met for the third time, in Rovinj, Croatia back-to-back to the Radiation Protection Week. This meeting was organised by CONCERT WP5. The aim of this meeting was to have an exchange between researchers and stakeholders, and to allow stakeholders to have a say in developing the research priorities. Concerning the joint roadmap it was suggested to better explain the link between exposure scenarios and research challenges by indicating the concerns related to practical radiation protection.
At the occasion of the participation of the WP leader to a International Dose Effect Alliance workshop on adverse outcome pathways, organised by Electric Power Research Institute 4-5 December 2018 in North Carolina, the joint roadmap was presented to low dose research and regulatory organisations from all over the world. CONCERT and the joint roadmap were also presented at the NEA/CRPPH Scoping meeting on Global coordination of Low-Dose Research held in Milano, 17-18 September 2018.
This broad stakeholder consultation will help to validate the scientific challenges to be overcome, and to prioritise research accordingly. Once priorities are set, costs can be estimated for a long-term research plan for the next 20 years. Some stakeholders, including decision-makers at national level such as the CONCERT Management Board, and decision-makers at European level and other potential sponsors for radiation protection research will be invited to assist to explicitly discuss priority setting, budgets and budget allocation mechanisms, next to the other steps in the roadmap development.
It is planned to have a first joint roadmap for radiation protection research December 2019. The proposed Joint (WP3) and Individual (WP2) roadmaps may serve as a guide to organise a long-term plan for open research calls covering the different areas of radiation protection research, subject to appropriate funding at the national and European scale and regular updating.

Milestones and Deliverables

D3.5 If extra funding is available: Fourth Annual Joint Priority List submitted (M45)

WP4 - Organization and management of CONCERT open RTD Calls

Work carried out

During the third year of the EJP CONCERT, **Work package 4** was in charge of the follow-up of the nine research projects funded in the two CONCERT calls, three projects in the call 2016 and six projects in call 2017. WP4 developed four different templates for the scientific reporting: one midterm report and one final report for each call, adapted to the respective topics and conditions. The list of assessment indicators developed by WP4 was consulted for the development of the different scientific reporting templates.

Mid-term reports have been collected from all projects funded in the first call, CONFIDENT, LDLensRad and TERRITORIES; as well as of ENGAGE, SEPARATE, SHAMISEN-SINGS and LEU-TRACK funded in the second CONCERT call. Midterm reports of the projects PODIUM and VERIDIC of the call in 2017 are expected in March 2019.

WP4, in collaboration with the CONCERT coordination team, started the preparation for a final evaluation of the nine research projects funded by CONCERT at the end of the funding period. A panel of 4-6 international experts that participated in the evaluation process of one or both CONCERT calls will be invited to review the advancements and outcome of projects. The evaluation will be based on two different steps: the evaluation of the final scientific reports and the presentations given by the projects representatives at the final meeting of the EJP CONCERT, to which the reviewers will be invited. This allows a direct exchange between the reviewers and the project representatives and gives to the reviewers the possibility to direct questions to the teams of funded projects and to provide recommendations. The assessment reports on the follow-up (D4.3 and D4.6) of WP4 will contain the written reports on the evaluation given by the review panel. This final evaluation will provide the EJP CONCERT with an external feedback and analysis of the success and impact of the funded research projects.

A report on the second CONCERT call including a "Lessons learned" was developed by WP4 and is available as deliverable 4.5. Additionally, following the request of the European Commission, a new deliverable (D4.9) was developed: "**Research funded under the two CONCERT calls**" (month 34). This document comprises the results of both CONCERT calls in one single report file.

Furthermore, the outcomes of the second CONCERT call have been presented in collaboration of WP1 and WP4, together with the six funded projects, in the special issue 3 of AIR2, in February 2018. Additionally, WP4 partners MINECO and FCT contributed actively in the preparation of different AIR2 issues, on February (Issue N°24) and April 2018 (Issue N°26), respectively. Both partners presented their organisation and their involvement in CONCERT within the part: "The floor to…" of the issues.

Milestones and Deliverables

D4.9* Researches funded under the two CONCERT calls (M34) - sent to WP1 and available online
*Newly introduced deliverable as per request by the EC

MS22 Midterm evaluation of granted proposals from the 1st call finished (M30) – The midterm reports of the first CONCERT calls are collected. The report is under preparation.

MS23 Midterm evaluation of granted proposals from the 2nd call finished (M42) – The midterm reports of the second CONCERT calls are being currently collected.

WP5 - Stakeholder involvement and communication in radiation protection research

Work carried out to date

CONCERT Work package 5 concerns stakeholder engagement activities; from the outset four main activities were envisaged: (i) Prepare a CONCERT stakeholder management strategy, (ii) establish a stakeholder panel, (iii) plan, launch and analyse a public facing survey, (iv) develop core information on radiation exposure and risk for the CONCERT web page. The CONCERT stakeholder group held a meeting in Antwerp, on the 15th of June, 2018 during the RICOMET Conference, to discuss specifically the CONCERT joint Roadmap for Radiological Protection Research. Another meeting took place at the 2018 Radiation Protection Week held in Croatia, on the 5th of October 2018. Moreover, the members of the Stakeholder Group were invited to attend the CONCERT MB on the 4th of October to listen to the presentation of CONCERT Projects. Several Web meetings with the members of the Group will be organised in 2019 to further discuss the CONCERT Joint Roadmap. The first one took place on the 19th of February 2019 (Month 45).

WP5 supported two speakers at ERPW2018, one providing insights into risk communication in the wider media. The WP also supported one speaker at the ERR meeting in August 2018. .

Task 5.3 concerns development of stakeholder survey activities and the use of social media. In the current period, since the close of the survey for responses, an analysis has been undertaken and a draft report is available and under discussion within WP5 with a view to finalising in the near future. The analysis provides useful information on respondent's perception of radiation risks and their management. Additionally, the survey response provide insights into the information that respondents would find useful. Information on radiation exposure and risk has been developed and posted on the CONCERT website (http://www.concert-h2020.eu/en/Stakeholders). In addition to a Stakeholder landing page that integrates the information, sections covering 'What is ionising radiation?', Natural sources, artificial sources, health effects and radiation risks in context are available. The material draws on and integrates relevant resources available from trusted and credible sources elsewhere on the Internet. This information has been reviewed and minor modifications made in the reporting period.

Milestones and Deliverables

D5.4 Review and update of website material Completed M37

WP6 - Access to infrastructures

Work carried out

The WP6 partners have continuously worked to reach the 4 main objectives to increase the visibility of infrastructures: (i) to analyze the present status of our list of infrastructures to analyze and understand the situation: lacks and potential solutions (ii) to prepare regular information about infrastructures, (iii) to propose harmonise practices and protocols through infrastructures (including databases and sample banks), (iv) to develop a strategy with its roadmap for facilitating access to infrastructures.

The activities of WP6 members have been concentrated on the organization and actions needed, in order to consolidate the ongoing steps of actions of the three previous years. For that, WP6 group has organised two meetings in 2018, the first was organised at CIEMAT (April 2018), the second in October 2018 during the Radiation Protection Week, at Rovinj. The next one is under preparation and planned in April 2019.

Task 6.1 Promote the visibility of research Infrastructures

WP6 partners have created a free web access infrastructure database AIR²D². It includes suitable infrastructures validated *a priori* by their frequent use in previous researches over the domains of activities of CONCERT. This database is set-up in the way to those infrastructures owners could add technical information and new owner candidates could themselves registered. The situation observed today is that AIR²D² comprised 98 infrastructures, not all of which are intended to be featured in the AIR² bulletin, but on one year, an increase around 10-20% is observed. Besides about 300 new database users could be attracted in the year 2018.

To implement and elevate the publicity of the database, the group has developed two tools. First, some common slides for communication to give all WP members the opportunity during meetings, workshops or others symposium all over Europe to present and advertise AIR² and AIR²D² to interested colleagues from

various research fields. The second is a flyer with summarised information for interested persons. Both are available for members on the CONCERT website.

Through EURADOS, a reminder was sent to the owners and potential users of platforms to fulfill and use the Air^{2}D^2 database. A letter was sent to each EURADOS Voting Members representing 71 European institutes involved in radiation protection activities in general, in particular dosimetry.

As a zoom, it comprises for example, an oral communication was done by Maria Panagiotopoulou about AIR² and AIR²D² at the last ERPW at Rovinj. More than a campaign, continuous and permanent actions have been carried out, asking to everyone who had or not published in AIR² to record their infrastructure in AIR²D² in order to complete/validate the data.

The monthly Bulletin: AIR² "Access to Infrastructures for Radiation protection Research" is now at the 34th issue and it has been decided to stop at the 40th issue in September. Another special issue, now the 4th, has been published during this period dedicated to NASA infrastructures concerning the three categories now well-known to our readers

Task 6.2 Harmonise Practices and Protocols

STORE has continued to build submissions and has been engaged in intensive outreach activities in this past year. The platform is stably integrated now into the BfS infrastructure and although there are some process problems in maintenance, these are being addressed by the BfS.

Current data on the STORE database:

- 46 Registered Users in the new system; 49 in the old; a total of 95
- 126 Studies; an increase of 30% from last year
- 193 Datasets; an increase of 30% over last year
- 1107 additional files with a total of 4100 files and links. Links are either to other data repositories, databases or biomaterials resources.

Closely collaboration was undertaken with LDLensRad project members with meetings in January in London and Munich in late May 2018 to help guide data sharing and data management from the completed project. The May meeting also constituted a training workshop with LDLensRad members.

Presentations and/or training about STORE were given at the following meetings:

- Low dose ionising radiation effects on the ecosphere, a workshop of the IUR, Stirling, June
- 44th European Radiation Research conference, Pecs, Hungary. August
- Radiation Research 2018, Chicago, September
- 3rd European Radiation Protection Week, Rovinj, October
- HEIR, 2018, Fontenay-aux-Roses, October

A comprehensive paper contextualizing and describing STORE and large-scale resources in radiation science: "Big data in radiation biology and epidemiology; an overview of the historical and contemporary landscape of data and biomaterial archives" has been accepted and will be published soon (2019) in International Journal of Radiation Biology.

A survey of motivation and perceived problems for data sharing and use of data resources was conducted by UCAM and MTA-EK and published in Radiation protection and dosimetry. (Survey on data management in radiation protection research (2018) Madas, B., and Schofield, P.N. *Radiation Protection Dosimetry*.)

The discussion continued about the possible intercomparisons exercise among the low dose-dose rate facilities at the SU, PHE and ISS: So far, no funding could be allocated to this purpose.

Task 6.3 Strategy for facilitating access to infrastructures

Activities for establishing the strategy for facilitating access to infrastructures have been discussed particularly at the WP6 meeting in October 2018 were possibilities were been reviewed, analyzed and

discussed. A pilot network of few infrastructures has been built voluntarily by several partners in order to respond to EURATOM call NFRP-7.

Conclusion

Finally, a strong part of the exchanges between members was dedicated to preparation of two deliverables. The first is D6.5 "Report on integration of archived materials in STORE/radioecology data bases" to be done in May 2019 (M48). Part of this task has already been initiated in the published survey of archived materials in the upcoming publication in IJRB. The second is the deliverable D6.6, which will be the final completely developed web-handbook based on the first deliverable D 6.4**: "**Publishing the first version of a web-handbook based on the newsletters each featuring a different type of infrastructure and their access (including funding)" (http://www.concert-h2020.eu/en/Publications). This first version was also built to prepare the next deliverable D6.6 (M60) were chapters will be developed with introductive talks about the global landscape, the detailed content and also the lacks of this inventory. Discussions are ongoing to identified contributors, experts and suitable writers.

Milestones and Deliverables

There were no deliverables and Milestones due between M37 and M45

WP7 - Education and training

Work carried out

Task 7.1 – Attracting and retaining students and junior scientists into the Radiation Protection research fields

Subtask 7.1.1 – Student travel grants

In order to further the policy of developing and maintaining expertise in the radiation protection research community, CONCERT is offering 10,000 € per year for travel awards to junior scientists. Support can be given for participation in a conference, a course or for an exchange visit to a laboratory, where this can be shown to be of value for increasing the applicant's involvement and knowledge/skills in current European research in radiation protection. There are four application deadlines per year: 31 March, 30 June, 31 September and 31 December. After each deadline a maximal sum of 2.500€ is paid out to the top applicants. The maximal level of support per applicant is 625€.

During this reporting period, there have been three application periods. The results were as follows:

- June 2018 12 grants
- September 2018 7 grants
- December 2018 6 grants

They were distributed among member States as follows:

- Belgium 2
- Finland 1
- Poland 1
- Sweden 3
- Portugal 1
- Germany 4
- Spain 3
- UK 2
- Hungary 3
- Italy 2
- Greece 1
- Czech Republic 1
- Netherlands 1

Subtask 7.1.2 – Academic mobility in EU universities

The possibility of increasing transferability within the EU states was investigated, in order to facilitate cross-crediting university course modules (such as the MScs in Radiobiology and Radioecology), and work towards full mutual recognition of pre-requisites and degrees. The work was reported in Deliverable D7.6 in November 2018.

Task 7.2: Education and training as an essential part of dissemination and knowledge management within CONCERT

The purpose of this task is to promote E&T as an integral part of CONCERT-funded RTD projects, by requiring proposals to include evidence that due consideration has been given to the incorporation of graduate student involvement and the offering of new or specialist technologies as topics for E&T courses. The wording that was used for the two CONCERT calls was as follows:

"Education and training is an essential part of all activities within CONCERT. Proposals shall include a plan for integration of education and training into the research programme, with a description of the proposed activities. This must also give details of collaboration or involvement with academic departments, and of intended PhD thesis work, MSc project work, teaching seminars, ad hoc courses on the topics of the proposal, etc., where possible. The plan will be assessed as an essential part of the impact statement and will be considered within the evaluation procedure."

A report on E&T activities such as student placement, courses seminars, workshops, etc. in the projects funded in the first CONCERT call in response to requirement was completed during this period and submitted as Deliverable D7.7

Task 7.3: Targeted E&T initiatives

Up to the time of reporting there have been four open calls for institutions to host short courses. Eight courses were funded in the first call, fourteen in the second and third calls, and eleven in the fourth call. They are listed on the CONCERT page http://www.concert-h2020.eu/en/Concert_info/Education_Training All of the applications to hold courses were accepted for funding in the first 3 calls. In the 4th call there were 15 applications, but only eleven could be funded. The Education and Training Committee ranked the applications and the highest-ranking applications were funded.

Task 7.4: Coordination and collaboration on E&T policy and strategy

Subtask 7.4.1: Coordination and collaboration

Negotiation with the organising committee for ERPW 2018 at Rovinj, Croatia to hold a session on E&T unfortunately was not successful, so on this occasion there was no E&T forum. However, the opportunity was taken to hold a meeting of participants in WP7 and detailed plans were made for a plenary session on E&T at ERPW 2019 in Stockholm.

Subtask 7.4.2: Vocational training for experts foreseen in the new Euratom BSS directive

This subtask has been started by Task 7.4 leader SCK-CEN and will be reported in D7.16 in month 60.

Task 7.5: European integration of junior scientist career development

The activities to promote young scientists' career development so far have not aligned well with the five subtasks listed in the CONCERT description of work. Part of this has been due to the unfortunate collapse of the platform for young scientists, EURAYS, and part due to the task being under-resourced for the amount of work proposed. However, plans have been made for a number of activities for young scientists at ERPW 2019 in Stockholm. These include dedicated presentation and poster sessions, and teaching sessions aimed at scientists newly entering the research area.

Milestones and Deliverables

D7.3 3rd Annual report on awards and grants given (M36), delivered M36
D7.6 Report on potential transferability and mutual recognition of E&T credits and qualifications in Europe ((M36), delivered M41.
D7.7 1st Report on E&T activities such as student placement, courses seminars, workshops, etc. in RTD Call 1 (M36), delivered M38
D7.11 3rd Annual report on E&T initiative funded under Task 7.3, including participant feedback and recommendations for next calls (M36), delivered M36
D7.15 3rd Annual reports on the progress of Task 7.4 (M36), delivered M36

MS39 4th Annual call for E&T initiatives (M39), delivered M36
MS44 4th Annual meeting of interest groups (M42), not met (see T7.4.1 above)
MS50 Nomination of the NEWS network committee to prepare dialogue meetings (M36), not met (see T7.5 above)

WP8 – Ethics

This work package sets out the 'ethics requirements' that the project must comply with.

WP9 - Research projects selected through CONCERT open calls

Work carried out

The objective of WP9 is to bring together RTD activities selected through two open calls for research projects organised along the CONCERT project. The nine different research tasks have been selected through the two transnational calls for proposals on “Radiation Protection Research in Europe” through the EJP CONCERT:

- Task 9.1 CONFIDENCE
- Task 9.2 LDLensRad
- Task 9.3 TERRITORIES
- Task 9.4 ENGAGE
- Task 9.5 LEU-TRACK
- Task 9.6 PODIUM
- Task 9.7 SEPARATE
- Task 9.8 SHAMISEN-SINGS
- Task 9.9 VERIDIC

BfS as leader of this WP will have the responsibility to follow up the progress of the different research projects.

Task 9.1 CONFIDENCE

First of January 2017, the CONFIDENCE (COping with uNcertainties For Improved modelling and DEcision making in Nuclear emergenCiEs) project started as Task 9.1 of CONCERT. The project focuses on identifying and reducing uncertainties in the release and post-release phases of an emergency. The latter includes the transition between the short-term post-release and recovery phases (e.g. the first year(s)). The following describes work performed between June 2018 and February 2019.

In SST 9.1.1.1, uncertainty propagation simulations were carried out (Task 1.2) for hypothetical accidental scenarios in Europe. The case studies, in particular input/output data, had been defined at an early stage of the project. The Borssele case study consisted in using a fine-resolution meteorological ensemble provided by KNMI at the Dutch power plant of Borssele for 11-13 January 2017 (meteorological scenario with small uncertainties). Two release scenarios were investigated: a short-release scenario (4 hours) which corresponds to the threat phase with large uncertainties on the release time; and a long-release scenario (72 hours) which corresponds to the release phase (no uncertainties on the release time or accidental scenario). For this scenario, an ensemble of source terms issued from the FASTNET project was used. Subsequently, all participants used the meteorological ensembles and source terms to propagate these uncertainties through atmospheric dispersion models. The results (deposition, air activity concentrations and dose) were compared. The variability of the uncertainty outputs was analysed. Preliminary results were shown in deliverable D9.4 (D1.3) for the short release scenario in January 2019, and results were more extensively discussed during WP1 meeting in Munich (5-7 February 2019). WP6 participants were also present to discuss uncertainty representation and ensemble visualization.

In ST 9.1.2, work on assessing uncertainties in stationary and mobile environmental monitoring systems and on how to reduce this uncertainty by an optimised monitoring strategy is close to completion. Apps that enable dose-rate measurements using the camera sensor of the smartphone have been evaluated in reference fields (D9.8). A prototype of a data processing unit for thyroid dose monitoring as s smartphone app has been developed (D9.9) and the workshop to better integrate biodosimetry into emergency response successfully carried out (D9.11). The software tool for calculating health risk estimates with uncertainties based on individual exposures has been developed, whereas for aiding decision making it has been decided to develop an approach to estimate the number of expected excess cancer cases in a given affected region.

ST 9.1.3 has produced a deliverable (D9.13) the focus of which was an evaluation of the FDMT (Food Chain and Dose Module for Terrestrial Pathways) as implemented in the JRodos and ARGOS decision support systems. It also presented results of a questionnaire survey sent to Japanese scientists to capture issues experienced in human food-chain transfer modelling in the first few months after the Fukushima accident. A paper reporting a critical review of Cs soil-plant models has been submitted for publication. A sensitivity analyses of parameters in an established model to predict the soil distribution coefficient for Sr has been conducted. Studies have been conducted looking at the behaviour of 131I sprayed onto grass and potato plants at two sites with differing stable I status (coastal and inland). Plant growth studies have been performed using a number of crop and soil types and samples are undergoing analyses; results will be used to test a process based Sr model and also phylogenetic models of plant uptake. Soils collected from across Europe have undergoing study to determine their radiocaesium interception potential. A review of transfer parameters in the human food chain for Mediterranean ecosystems has been conducted.

Under ST 9.1.4, the Subsubsubtasks to address uncertainties in both urban/inhabited and agricultural/food scenarios (9.1.4.1.1 and 9.1.4.1.2) have been completed, and the respective deliverables D9.20 (D4.3) and D9.21 (D4.4) were prepared and released. A document to guide to partners in the organisation of the national panels were prepared (SSST 9.1.4.2.1). Seven out of the nine countries, have already conducted one or two sessions of their panels between June and December 2018. It is foreseen to conclude the missing sessions in the coming months. The D9.22 (D4.5) has been compiled with all the national reports presenting the joint preliminary results. The results of the first Delphi round (SSST 9.1.4.2.2) have been analysed and the second round is being designed to be launched during February 2019. A WP meeting was held in November to present the results of these works and to plan the work to undertake on this year.

In ST 9.1.5, research has been carried out to identify social uncertainties in emergency and post-emergency situations based on case studies of past nuclear accidents and incidents (seven case studies, D9.25); studies of expected behaviour and information needs in emergency situations (three countries, D9.26); mental

model studies (research carried out in six countries, report scheduled for end of February 2019); and observation of emergency exercises (29 observations carried out in six countries; report scheduled for end of February 2019). A review of communication tools for emergency situations has also been undertaken. For SST 9.1.5.3 a first national workshop took place in January 2019; further workshops are planned in February and March 2019. The development of the methodology for SST 9.1.5.4 is progressing; the international workshop is foreseen to take place by the end of May 2019. Face-to-face meetings and dissemination of results took place in Dublin (NERIS Workshop, May 2018), Antwerp (RICOMET, June 2018), Paris (MUTADIS, Oct. 2018) and Brussels (Brussels airport, Dec. 2018). Several scientific articles are in preparation.

ST 9.1.6 developed an internal report with the title "The Various Meanings of Uncertainty" shaping our understanding of uncertainties in CONFIDENCE. The MCDA software has been enhanced to deal with uncertain input, originating either from model results or from input of the user. The newest update was made available in December 2018. A detailed description of the tool was provided with D9.34. In the D9.33, indicators for robust decision making were described. The MCDA tool was tested in the Dutch stakeholder panel in 2018. In 2019, proposed solutions will be tested in further stakeholder panels. The development of the agent based system to simulate the decision process of decision makers continued. Work focused on the understanding of the decision making process in European countries and the negotiation process between the decision makers. The latter one is documented in D9.35, completed in December 2018. Joint work is now underway with WP1 to develop, display and evaluate possible techniques for visualising uncertainty by WP1 results.

ST 9.1.7 deals with education and training activities and dissemination of results. The training course under the SST 9.1.7.1 on Use of uncertain information by decision makers, First and Second announcement including programme has been announced and registration took place. The training course/workshop will take place in May 13-15, 2019 in Trnava, Slovak Republic. Training course/workshop under SST 9.1.7.2 will take place in Madrid, Spain and agenda as well as advertising is under development. For the lectures under SST 9.1.7.3, universities from Belgium, Norway, Slovakia, Italy and in addition from Germany and Slovenia have been addressed. First announcement of the CONFIDENCE Dissemination workshop has been prepared and advertised. The Agreement on Special issue of Radioprotection Journal with CONFIDENCE project outcomes presented at the dissemination workshop is under preparation. WP7 meeting is scheduled to take place before NERIS Platform workshop in April 2, 2019 in Roskilde, Denmark.

ST 9.1.8 deals with the operation of the CONFIDENCE project. The Management Board meets once per month to discuss the progress of the project, the next steps and initiate actions if necessary. The interaction with the CONCERT stakeholder group continued. The interaction with TERRITORIES that started at the Dublin workshop in April 2018 continued and a new meeting is scheduled for April 2019.

Milestones and Deliverables

D9.11 Report on a workshop for integration of biodosimetry into emergency response (M37) (Delivered M43)
D9.25 Report on case studies of nuclear and radiological events (M37) (Delivered M37)
D9.33 - Indicators for robust decision making (M35) (Delivered M37)
D9.34 Improved MCDA tool for decision making under uncertainty for panels (M37) (Delivered M37)
D9.20 Addressing the uncertainties in urban/inhabited scenarios (M39) (Delivered M40)
D9.21 Addressing the uncertainties in agricultural scenarios (M39) (Delivered M40)
D9.8 Database of smartphone app / dosimeter evaluation (M39) (Delivered M43)
D9.13 Improving models and learning from post-Fukushima studies (M43) (Delivered M43)

D9.35 ABM tool with artificial intelligence to compare decision strategies for panels (M43) (Delivered M43)
D9.4 Published sets of probability maps of threshold exceedance for scenarios provided to WP4, WP5 & WP6-->02 (M43) (Delivered M44)
D9.9 Prototype of processing unit for thyroid dose monitor (M43) (Delivered M43)
D9.22 Compilation of national stakeholder panel reports (M44) (Delivered M45)

Task 9.2: LDLensRad

The EU CONCERT funded 'LDLensRad' project (Towards a full mechanistic understanding of low dose radiation induced cataracts) aims to bring together experts from across Europe to answer a number of key research questions on the topic of radiation effects on the lens.

During the current reporting period the focus has been on generation of experimental data. Irradiations and lens imaging for cataract development in long-term mouse models are progressing according to plan, with additional groups of mice added after irradiation at 2 days after birth in order to further investigate initial indications of early susceptibility. Data collected to date indicate that background levels of lens density assessed by the Scheimpflug are remarkably consistent across the different strains and labs, within the expected limits due to genetic variation. No significant radiation induced differences in lens density have been observed in most models, however, some genetic differences and radiation dose and dose rate effects have been observed.

Initial data on individual mechanistic endpoints is also being collated. DNA damage responses assessed by 53BP1 also indicates differences between the lower (0.063 Gy/min) and higher (0.3 Gy/min) dose rate exposures – with the dose rate effect seemingly dominating the dose effect in some circumstances. Initial data following whole mounting and 3D optical imaging, suggests increased densities around the germinative zone, at very short time periods after 0.25 Gy X-rays. The mechanism is as yet unclear and further experiments are also underway. Initial NGS in ENEA samples has also been carried out. Large strain differences have been observed here too, and some initial indications of radiation differences, but with several genes/miRNAs but no obvious pathways identified yet.
In terms of *in vitro* experiments to support the mouse model programme, proteo- and lipidomic analysis is progressing well, with identification of differential responses in oxysterols as low as 100 mGy *in vivo*. Work on this assay will shortly begin in lens samples taken from Mayak PA workers, in partnership with SUBI. *In vitro* validation and additional experimentation on the additional endpoints has now started at ENEA (intracellular communication endpoints) but the bulk of the remaining work will now be completed by OBU in partnership with PHE. Considering whether lens changes might be used as biomarkers of global radiation sensitivity, there is initial evidence of dose and dose rate effect with 2 Gy having a significant impact, but further work needed to clarify the observations to date. The next stage of the research is to begin collating the data to test the mechanistic hypotheses.

Representatives of all partners and several AB members attended the Annual Meeting (AM) 2018 organised in central Munich on the 5th – 7th June 2018. In addition, regular email contact is maintained between the partners carrying out the day-to-day laboratory work and between all project partners and Advisory Board members through regular updates from the PI and regular teleconferences between laboratory partners. The project ResearchGate site is well visited (https://www.researchgate.net/project/LDLensRad-the-European-CONCERT-project-starting-in-2017-Towards-a-full-mechanistic-understanding-of-low-dose-radiation-induced-cataracts). In terms of scientific dissemination, the project has been presented at over 20 national and international meetings to date. The project Advisory Board members (AB) have been hugely important to the successful progression of the project to date. The most recent AB review, following presentation at

the AM 2018, was very positive. For wider stakeholder engagement, during this period the LDLensRad 'Medical Professional, Public and Patient' involvement event that took place at PHE on the 24th May 2018. Invitees from each of these important stakeholder groups listened to presentations on the LDLensRad project and associated work programmes at PHE, then were given the opportunity to comment. All attendees expressed support for the project.

In summary, the LDLensRad project continues to progress well and integration of the partners within the collaboration has been highly successful. It is anticipated that the proposed work plan will be completed as per the original schedule of milestones and deliverables, with no problems or delays anticipated.

Milestones and Deliverables

Deliverables **D9.53** - Progress summary and actions - year 2 (Report), and **D9.56** - Year 2 advisory panel report (Report), were submitted in December 2018,

Milestones 4 and 5: Irradiation of mice at PHE, HMGU and ENEA and organisation of a progress meeting, have been completed according to the original work plan, as outlined above.

D9.53 Progress summary and actions-2nd year (M43)
D9.56 Year 2 advisory panel report (M43)

Task 9.3 TERRITORIES

The TERRITORIES project, led by IRSN, started on 01/01/2017. Last Annual Meeting was held on 7-8/02/2018 in Munich and next one will be on 21-22/03/2019 in Oxford. The final event will be organised in Aix-en-Provence, 13-15/11/2019.

Subtask 9.3.1 (Quantifying variability and reducing uncertainties when characterizing exposure of humans and wildlife by making the best use of data from monitoring and of existing models), led by CIEMAT, targets mechanistic fit-for-purpose knowledge for diagnosis and prognosis of the environmental behaviour of the radionuclides in different selected ecosystems.
Progress between June 2018 and February 2019 included:

- Continuous update of the "Territories Library Database", a database describing sites of interest for subtask 9.3.1 case-studies,
- 1st version of "Guidance to reduce sampling uncertainty", an internal report reviewing the most used techniques for the characterization of this sampling uncertainty, and providing recommendations on the reduction of this sampling uncertainty
- Finalisation of "Application of existing models to sites" and "Improved models", two internal reports presenting the results of the application of several pre-existing models (resp. improved models) to the different case studies of the Territories Library Database,
- 1st version of "Methodology to quantify improvement", an internal report presenting a methodology to assess model performance and model improvement in radioecology.

These five achieved milestones have been intermediate steps towards four deliverables to be submitted mid-2019.

Subtask 9.3.2 (Reducing uncertainties when characterising exposure scenarios, accounting for human and wildlife behaviour, and integrating social and ethical considerations in the management of uncertainties), led by PHE, aims to validate the added value of a realistic description of the exposure scenarios versus a generic scenario approach, and to integrate social and ethical considerations about uncertainties.

Progress between June 2018 and February 2019 included:

- Continuation of the field case-study about human behaviour, internal and external exposure, in Kamaryn, a village in Belarus (described in two internal reports: "Belarus/quantify variability in behaviour" and "Belarus/impact of variability in behaviour")
- Finalisation of "Humans/impact of variability in behaviour", an internal report discussing human behaviour in terms of occupancy and dietary intake, based on literature research on a generic nationwide scale as well as for special local population groups with their own behaviour and habits,
- Finalisation of "Wildlife/impact of variability in behaviour", an internal report presenting issues and recommendations when dealing with dose reconstruction for wildlife, taking into account the variability introduced by the "behaviour" of organisms
- Practical implementation of the "Lab ethnography protocol" (defined in the previous period)

These five achieved milestones have been intermediate steps towards two deliverables to be submitted mid-2019.

Subtask 9.3.3 (Stakeholder engagement for a better management of uncertainty in risk assessment and decision-making processes including remediation strategies), led by CEPN, and co-led by NRPA (new name DSA), develops methods for a holistic management of uncertainties associated with remediation (dose reduction, socio-economic cost, generated waste amount etc.) and for an integrated decision-making process.

Progress between June 2018 and February 2019 included:

- the elaboration of the case-studies for interactive experts/stakeholders panels,
- reflection groups, and socio-economic analysis works (Cost Benefit Analysis and Multi Criteria Decision Analysis).

These three achieved milestones ("Elaboration of case-studies/NORM", "Elaboration of case-studies/post-accident", "Alternative remediation pathways") have been intermediate steps towards five deliverables to be submitted mid-2019. Implementation of these case-studies are on-going, and one of the national experts/stakeholders panels has already been held, in Bordeaux in December 2018.

Subtask 9.3.4 (Strategic and integrated communication, education and training), led by University of Tartu aims to share with a wide audience (stakeholders and decision-makers, young scientists, students) the methodological approach and novel guidance documents developed. Progress between June 2018 (M37) and February 2019 (M45) included:

- Continuous update of the TERRITORIES website, http://territories.eu, and blog, https://territoriesweb.wordpress.com
- Organization of a workshop in Madrid in June 2018, and reporting the conclusions in deliverable D9.74
- Preparation of a workshop to be held in Oxford in March 2019 (expected audience: 100 people, including ca. 30 students and several early career professionals or post-doc)

Milestones and Deliverables

Thirteen project milestones related to task 9.3 were due until M45. All of them have been reached and are described in the former section:

- 5 milestones of 9.3.1:
    - Intermediate versions of the "Territories Library Database"
    - Draft of deliverable on "Guidance to reduce sampling uncertainty"
    - "Application of existing models to sites"
    - "Improved models"
    - Draft of "Methodology to quantify improvement"

- 5 milestones of 9.3.2:
  - "Belarus/quantify variability in behaviour"
  - "Belarus/impact of variability in behaviour"
  - "Humans/impact of variability in behaviour"
  - "Wildlife/impact of variability in behaviour"
  - "Lab ethnography protocol"
- 3 milestones of 9.3.3:
  - "Elaboration of case-studies/NORM"
  - "Elaboration of case-studies/post-accident"
  - "Alternative remediation pathways"

One project deliverable has been submitted between M37 and M45:

D9.74 After each training_2nd year. Submitted M42 (initially planned M43).

D9.60 Guidance to reduce sampling uncertainty (due M44 postponed to M60; an intermediate version / Draft was submitted.

Task 9.4 ENGAGE

The ENGAGE project ("ENhancinG stAkeholder participation in the GovernancE of radiological risks for improved radiation protection and informed decision-making") reviews why, when and how stakeholders – including wider publics- are involved in radiological protection. It addresses three contexts: medical exposure to ionising radiation, post-accident exposures and exposure to indoor radon. For task 9.4.1 (rationales and frameworks for stakeholder engagement) activities included the refinement of the research methodology for task 9.4.1 and the first analysis of *rationales and frameworks for stakeholder* engagement (based on document analysis), as well as a number of participatory activities (roundtables on stakeholder engagement in relation to emergency preparedness, indoor radon and medical exposures to ionising radiation). Collection of data through interviews with different international and national stakeholders is in progress.

For task 9.4.2, a study of key challenges, best practices and recommendations for stakeholder engagement (D9.82) has been carried out. Radon websites were analysed from a stakeholder engagement perspective in eight European countries. A mapping experiment of experiences and expectations concerning participation has been carried out with radiation protection researchers at the Radiation Protection Week (Rovinj, 2018). Other case studies of stakeholder engagement in practice are currently in progress. A special session on stakeholder engagement has also been organised by ENGAGE partners as part of the RICOMET 2018 international conference.

For T9.4.3, case studies on the role of radiation protection culture for enhancing participation and informed decision making in radiation protection have been elaborated in the three areas addressed by ENGAGE. A dedicated workshop has been organised in Athens (13-15 February 2019) to discuss the findings from the case studies and the recommendations to be drafted on the basis of these findings.

For T9.1.4, the preparations for the final project workshop have been started. The date and place have been fixed to 11-13 September 2019, in Bratislava, Slovakia. Several dissemination activities have been undertaken: presentations at the European Radiation Protection Week, RICOMET 2018, one scientific article submitted. First ideas about the knowledge base have been discussed at the NERIS 2018 workshop and RICOMET 2018.

Face-to-face meetings have been held in Antwerp (at RICOMET, June 2018), Rovinj (ERPW, October 2018), Fontenay-aux-Roses (CEPN, October 2018) and Brussels (SCK•CEN, December 2018).

The next steps include finalisation of the report on radiation protection culture (ST9.4.3), finalisation of data collection and analysis for T9.4.1 (rationales and frameworks for stakeholder engagement) and T9.4.2 (case studies of participatory practices in radiation protection), drafting the conceptual design of the

knowledge base for stakeholder engagement in radiation protection, and the organisation of a stakeholder consultation at the RICOMET 2019 (July, Barcelona).

Milestones and Deliverables

D9.82 Report on key challenges, best practices and recommendations for stakeholder engagement (M39) submitted

Milestones:

- Annual project meeting (M36, achieved at M37);
- Draft report on key challenges, best practices and recommendations for stakeholder engagement (M37, achieved);
- Draft report on rationales and frameworks for stakeholder engagement (M42, achieved);
- Draft report for radiation protection culture case studies (M41,achieved))

Task 9.5 LEU-TRACK

Within SST9.5.1.1 consortium agreement was signed by all partner by April 2018; an interim meeting was held in Rovinj, Croatia on 30 September 2018, where the actual state and progress of the project was discussed; a Skype meeting was held with partners on 30 January 2019, where progress of the scientific work, planning of training and dissemination activities as well as planning of deliverables was discussed.

Within SST9.5.1.2, scientific results related to the project were presented at various domestic and international meetings. Altogether two peer reviewed articles and 14 communications at scientific meetings were completed during the first period of the project.

Within SST9.5.1.3 Eric Rutten, PhD student (PHE) and Amir Mofidi, postdoc (GUF) visited OKI to learn EV isolation protocols as well as EV phenotyping by flow cytometry. Dávid Kis has successfully completed his thesis for the master's degree with the title: "Radiation-induced bystander effects mediated by extracellular vesicles" at the Pázmány Péter Catholic University Budapest – Faculty of Information Technology and Bionics – Medical Biotechnology master program; Dávid Kis has successfully applied for a PhD grant at the Semmelweis University, Budapest, Károly Rácz School of PhD – Pathological Sciences – Experimental Oncology Program and started his PhD studies in February 2019. The title of his PhD project is: The role of EVs in radiation-induced bystander and systemic effects. Dávid Kis has successfully applied for a young investigator travel award at the European Radiation Research Society and presented his data in the form of a poster at the ERR meeting organised in Pécs, Hungary, August 21-25, 2018. Dávid Kis received a young investigator travel award from CONCERT and presented his data during the 3rd RPW meeting in Rovinj, 1-5 October 2018. LEU-TRACK members (Katalin Lumniczky and Soile Tapio) suggested and organised a Students' day section during the 3rd RPW meeting in Rovinj, 1-5 October 2018. Four PhD students or postdocs from LEU-TRACK partners (Nikolett Sándor, Eric Rutten, Prabal Subedi and Dávid Kis) presented their work in the form of oral presentations. The session offered an occasion for all young scientists participating in CONCERT research projects to present their data. It also offered possibility for young scientists not involved in CONCERT to introduce their work. Overall, 14 oral presentations were given.

Within SST9.5.2.1, 2 and 3; animal treatment, sample collection and distribution among partners and long-term follow up of the animals to monitor the influence of EVs on leukemogenesis was almost completed. At OKI 10-12 week-old male CBA/H mice were irradiated with 0 Gy (control), 0.1 Gy and 3 Gy. Bone marrow was isolated from treated animals, BM cells were pelleted and BM-derived EVs were isolated from the BM supernatant with Eqoquick precipitation solution and cleaned with PD SpinTrap G-25 (GE). EVs from all the

samples were characterised by Western blot, dynamic light scattering and flow cytometry. Plasma EVs were isolated similarly. Part of the isolated EVs was used for iv injection into naïve mice for long-term follow-up in order to monitor the influence of EVs on leukemogenesis. At present the number of treated animals available for long-term follow-up is close to 600. These animals will be followed up for 20 months to detect signs of leukaemia. Blood is regularly collected from animals every 6 months to screen for Sfpi1 gene alterations. The other part of the isolated EVs were either collected for proteomics analysis and stored at 4°C (for HMGU) or lysed in Qiagen lysis buffer for miRNA analysis and stored at -70°C (for PHE) until shipment. Samples were sent in two batches to HMGU and PHE. At GUF, after governmental approval of the animal experiment application, the first CBA mice (purchased from Charles River) were irradiated locally as detailed in the work plan using our small animal radiation platform (SARRP) to establish the protocols for exosome isolation from peripheral blood and bone marrow. Further analyses regarding the characterization of the exosomes are in progress.

Within SST9.5.2.4, the methodology for phenotypical characterisation of BM-derived EVs was synchronised between OKI and GUF. We have successfully established flow cytometry protocols for evaluating particle numbers as well as measure various BM cell surface markers on BM-derived EVs. Western blotting, regularly performed from each EV isolate indicated the presence of EV-related markers (TSG101, annexin and CD9) and the absence/low yield of other, non-EV-specific cellular markers (calnexin) in both the BM-derived and plasma-derived EVs. However, BM-derived EVs rendered more stable results in terms of the presence of EV markers, while plasma EVs were more variable. Preliminary phenotypical analysis indicates that irradiation increases the expression of certain EV-specific markers. BM-derived EVs carry mesenchymal stem cell, lymphoid, erythroid, granulocyte and megacariocyte progenitor markers. These markers generally increase with the dose but further experiments need to confirm the dose-dependency of the changes.

Within SST9.5.2.5 total RNA was extracted at PHE using the QIAGEN RNeasy mini kit protocol (Qiagen), and measured the miRNA content using the BioAnalyzer 2100 (Agilent technologies) for the bone marrow-derived EVs for both sample batches sent by OKI. The miRNA concentration and total yield from BM-derived EVs varied highly between samples. However, BioAnalyzer results confirmed that the RIN value of the extracted miRNA and small RNA is useable and that this is not degraded RNA. An nCounter assay of the bone marrow samples has been performed. The assay has worked, and analysis is in progress. Blood plasma RNA yields were extremely low; with the exception of three samples, almost no RNA was present. Isolation of increased blood-derived EVs needs to be performed and EV isolation protocols from murine plasma optimised in order to improve miRNA yield from murine plasma-derived EVs.

Within SST9.5.2.6 HMGU processed BM-derived EVs sent by OKI for proteomic analysis. There were following problems with the mass spectrometric analyses of such EVs: The EVs derived from BM contained contamination, which most likely originated from the filters used for EV isolation. The contamination damages the liquid chromatography (LC) column, as it sticks to the bonded silica and the separation of peptides is compromised. Therefore the samples were not measured. The EVs derived from blood plasma were rich in albumin the samples were not well enriched with EVs. In order to overcome this problem new methods to isolate EVs from BM that are compatible with mass spectrometry-based proteomics were tested at OKI. The EVs were isolated using ultracentrifugation or commercially available kits ExoQuick TC (EVs collected in two fractions) and ExoQuick Ultra. At Helmholtz Zentrum Munich (HMGU), EVs were lysed, trypsinised with the in-house FASP protocol and the peptides were separated and identified using high-performance liquid chromatography coupled to a mass spectrometer (MS) (LTQ Orbitrap XL). Only the second fraction using ExoQuick TC was measured on the MS as the first fraction contained polymers that disturb the MS measurements. Similar numbers of proteins were identified in EVs isolated from ExoQuick Ultra and ultracentrifugation. Although the EVs isolated with ultracentrifugation had higher abundances for

EV-markers, they also contained more calnexin (a marker for cellular proteins) and serum albumin (a marker of contamination with blood). Based on these results and on EV-protein yields (Table 2), it was decided to use ExoQuick Ultra for all further EV isolations from bone marrow. A similar optimization of the protocol for plasma-derived EV isolation is being tested at OKI. Additional irradiated BM-derived EVs will be sent to HMGU within the next 4 weeks for new proteomic analysis.

Within SST9.5.3.1 OKI investigated major cellular acceptors of EVs within the bone marrow and peripheral haematopoietic system. BM-derived EVs were successfully labelled with an RNA-binding fluorescent dye. Labelled EVs were co-incubated in vitro with total BM cells from naïve animals and EV uptake was evaluated with flow cytometry. EV uptake by lymphoid and erythroid progenitors was 20% lower compared to other cell populations, but irradiation had no influence on this process. These results need to be further confirmed.

Within SST9.5.3.2, cellular and molecular changes in the bone marrow of EV-treated mice are being investigated jointly by OKI and GUF. These experiments are currently in progress. Total-body irradiated animals to be processed 6 months after irradiation have been treated and the first experiments will start in March. EV-acceptor BM cells are being collected and will be shipped to PHE and HMGU to analyse proteomic and miRNA changes induced by the EV treatment. Shipment is foreseen within the next two months.

Within SST9.5.4 the aim is to identification radiation-related and leukaemia-risk associated biomarkers in human leukaemia patients subjected irradiation. At GUF the exact methodology was fixed to isolate and quantify EVs from human blood samples. Results demonstrate a clear expression of CD9 and TSG101, but not calnexin, in EVs isolated by ExoQuick PLUS, whereas other isolation methods did not reveal any EV-specific marker. Furthermore, blood samples were irradiated with a dose of 2 Gy and quantification of EV concentration was performed by a CD9 and CD81 specific ELISA system. Data revealed 1.22 x 10^7 and 2.84 x 10^7 exosomes/µl, respectively for non-irradiated and 2 Gy irradiated samples.

In the clinical part of the project, after local ethics approval, the first AML patient treated with total body irradiation at the Department of Radiotherapy and Oncology was subjected to blood collection before, in the course and after of treatment while recruitment of patients is ongoing. In addition to the methods of characterization of exosomes as described above, a cytofluorometric method using Megamix fluorescent labelled beads with defined diameters from 100 nm to 900 nm was performed. We set a gate in exosome size range of 100-400 nm and subsequently analysed expression of markers CD81 and TSG101. Preliminary findings revealed a percentage of 18.73% CD81 and 1.2% TSG101 particles in healthy blood donors, whereas leukaemia derived sample demonstrated 22% CD81 and 52% TSG101 positive particles. These data may indicate a differential expression of TSG101 in malignant conditions. However, these finding has to be confirmed in a larger cohort of patients.

Milestones and Deliverables

There were no deliverables due between M37 and M45

Task 9.6 PODIUM

The objective of PODIUM is to improve occupational dosimetry by an innovative approach: the development of an online dosimetry application based on computer simulations without the use of physical dosemeters. Occupational doses will be assessed based on the use of modern technology such as personal tracking devices, flexible individualised phantoms and scanning of geometry set-up. Because of the limited time frame, we will simultaneously use an intermediate approach with pre-calculated fluence to dose conversion coefficients for phantoms of different statures and postures. We will apply and validate the methodology for

two situations where improvements in dosimetry are urgently needed: neutron workplaces and interventional radiology.

ST9.6.1: Dose simulations input: staff movement monitoring and radiation field mapping

An IPS based on an infrared reflection time-of-flight sensor camera together with the corresponding software was set up to perform the tracking of the position and the posture of occupationally exposed workers. Considering the needs and objectives of PODIUM, the KINECT v.2 TOF camera was chosen. Software, named KINECT Data Acquisition (KDA), developed by SCK•CEN is used to govern the acquisition of RGB and depth images, and the recognition of bodies and body parts. We implemented a filter architecture that integrates jitter reduction, as well as statistical smoothing. The extracted coordinates of the joints by the IPS are relative to the camera coordinates. Therefore, to obtain real-world coordinates of the workers at different set-ups, a calibration procedure was been developed to transform the Kinect IR coordinates to the real-word coordinates. The IPS has been successfully tested in simple workplaces within SCK•CEN and UPC, and in a catheterization laboratory (Cath-lab) of UZ Brussels (Vrije Universiteit Brussel), Liège University Hospital and Skåne University Hospital in Malmö.
Because of the reported occlusions and FOV limitations, a second tracking approach based on a multi camera solution has also been analysed. We have developed a software to acquire the skeleton data from different view points so that the identification is correctly performed thanks to the data fusion from different sensors. At the moment of writing this report, the software is a beta version and its verification is in progress.

ST9.6.2: Dose simulations using computational phantoms and Monte Carlo methods

Three computational phantoms were selected based on the requirements of PODIUM. On one hand, we use two female phantoms with a realistic range of body statures from the well-established HMGU family of voxel phantoms. These phantoms Donna and Irene have been equipped with protective garment (apron and collar). On the other hand, we are also making use of the recently developed Realistic Anthropomorphic Flexible (RAF) adult male phantom, which is characterised by a high level of flexibility. In this case, the phantom is representing male doctors and nurses with body dimensions close to that of the ICRP reference man and can assume various postures. The Realistic Anthropomorphic Flexible phantom belongs to the Boundary Representation (B-Rep) generation of computational phantoms. Progress has been made on using MC-GPU to speed up calculations of doses to staff. MC-GPU has been successfully compared with PENELOPE calculations and TLD measurements. Simulations for a specific interventional room in Malmö university hospital achieved good statistics in fluence (calculated free in air) within 60 or even 30 seconds.

ST9.6.3: Development of the Dosimetry online Calculation Application

The goal of WP3 is to integrate the developments of the different work packages in a user-friendly online application called Dosimetry online Calculation Application (DCA). The development of the online application has started in October 2018. Regularly new prototype versions with new features are being released. Development, version control and issue tracking of the source code is done in a Gitlab environment setup by UPC. The external technical modules that are currently being developed by different PODIUM partners will also need to be integrated within the DCA.

ST9.6.4 Assessment and validation of the online dosimetry application in hospitals

The work package concerns validation of online dosimetry in interventional radiology. Ethical approval for clinical measurements has been obtained for the participating hospitals in Sweden and Ireland. The indoor positioning system has been tested on site in hospitals in Belgium and Sweden. Two categories of procedure ((i) Interventional Cardiology (Coronoary Angiograms (CA) or Percutaneous Coronary Intervention (PCI) and (ii) Endovascular Aneurysm Repair Treatment (EVAR)) have been selected for the feasibility study. The staff

will use both active and passive dosemeters – the type and number have been discussed – at the relevant locations of the operators.

ST9.6.5: Assessment and validation of the online dosimetry application in mixed neutron-gamma workplace fields

The main aim of this work package is to perform a proof-of-concept study of the online dosimetry in a mixed neutron-gamma workplace field. For the first stage of the experimental measurements a modified calibration laboratory at PHE with an ^{241}Am-Be source was selected. To generate a field more representative of a workplace, water shields were used to moderate the source. The real workplace field selected was that around a fuel flask at SCK-CEN. The options for performing coupled neutron-photon calculations of effective doses in a realistic workplace have been reviewed. The conclusion is that the current status of computing capability will not permit this in real-time. As a practical solution, we will use "look-up tables" of dose rate maps that will be dependent on the location and orientation of the individual. In preparation for this, and to contribute to an analysis of its accuracy, the PHE calibration room with the water moderators has been characterised via measurement and modelling.

ST9.6.6: Dissemination of the project results

An advisory board has been set up in order to guide the orientation of the project and to assess its implementation. Representatives from European and international organisations, (HERCA, EC, ICRP, and ILO) with experience in dosimetry and occupational exposure were contacted to give input and guidance to the project partners. A meeting of the advisory board was held in Malmö, Sweden, on 7th of November 2018. Minutes were kept so that all partners are informed of the Advisory's group comments and more specifically about their ideas on the problems discussed and the possible solutions. The consortium will also set out a roadmap for the further development of the application, in the form of an exploitation plan. A task group for this specific task has been formed in order to progress.

Milestones and Deliverables

The following deliverables were submitted in the reporting period (M37-M45):

D9.103 An IPS based on an infrared reflection time-of-flight sensor camera together with the corresponding software (M37).
D9.104 Database of phantoms of different statures and postures (M40).
D9.105 An IPS based on a developed camera network system and the multi-image acquisition computer system with the corresponding software (M43).
D9.106 part A: Guidelines for implementing the workplace geometry and the radiation field map in the dosimetry application (M43)
D9.107 Prototype of fast MC real time radiation dose estimate application to be tested in hospitals-postponed
D9.108 Report summarizing the feasibility of the methods, and the accuracy of personal dosimetry in a simple scenario (M43).
D9.109 First annual progress report (M44)
D9.110 Report with a documented test of concept in an experimental set-up (M45)

Task 9.7 SEPARATE

SEPARATE: "Systemic Effects of Partial-body Exposure to Low Radiation Doses" is an interdisciplinary project, combining in vivo irradiation, molecular/cellular biology, omics and bioinformatics to investigate how partial body irradiation (PBI) may have significant implications regarding systemic consequences and human health at low and intermediate doses of ionizing radiation.

The project started in October 2017, and at the time of this report substantial progress has been achieved. For WP1, ENEA has already completed irradiations of all mouse groups and the distribution of samples to partners. A total of 200 C57BL/6J mice (160 irradiated + 40 controls) were enrolled in the study of out-of-target radiation effects on shielded hippocampus, cortex, liver and heart, after doses of 0.1 or 2 Gy of X rays to the lower third of the body. Mouse groups were sacrificed 15 days or 6 months post-irradiation, and tissues/organs collected. Frozen/fixed samples have been shipped to HMGU and TU Dublin (former DIT) for transcriptomics, proteomics and metabolomics analyses. Frozen organs have also been sent to OBU for WP3 tasks.

Dosimetry has also been completed at ENEA. Two independent dosimetric methods have been successfully implemented and tested. Conclusions with both dosimetry methods used were that, under the shielded irradiation conditions adopted, there is no significant dose to the shielded organs.

For WP2, initial data on Next Generation Sequencing (NGS)-based miRNome analysis in control, irradiated and shielded tissues have been assembled at ENEA, including some very interesting initial observations on the differences in miRNA profiles of hippocampi and hearts at 15 days after TBI or PBI with 2 Gy, and from age-matched unirradiated mice. In hippocampus, 25 differentially expressed miRNAs after PBI (PBI vs 0Gy) and 19 differentially expressed miRNAs after TBI (TBI vs 0Gy) were detected. Notably, 19 miRNAs were in common between groups. Statistically significant miRNA lists were enriched with the corresponding top 20 predicted target genes in order to evaluate whether different regulatory pathways were perturbed. Results show that TBI and PBI converge on deregulation of the same molecular pathways, in particular the TGF-beta signalling (via upregulation of miRNA 122), the apoptotic signalling (via upregulation of miRNA 27a and 133a) and the DAG and iP3 signalling (via upregulation of miRNA 233), the last one crucial for the transmission across chemical synapses.

Results from miRNnome analysis of heart samples show 39 differentially expressed miRNAs after PBI (PBI vs 0Gy) and 208 differentially expressed miRNAs after TBI (TBI vs 0Gy) with a high degree of overlap of both miRNAs (n = 39) and deregulated signalling pathways between groups. A key role of the miRNA 122, controlling the deregulation of the TGF-beta signalling, has been highlighted after PBI and TBI of cardiac tissue.

In the attempt to identify a subset of miRNAs regulating the abscopal effect in a tissue-independent manner, we compared the differentially expressed miRNAs obtained in the hippocampus (n = 25) and heart (n = 39) after PBI. The Venn diagram shows 21 miRNAs in common; among these, our attention will focus on the overexpression of miR122 (involved in the radio-induced fibrosis) and miR-1, whose cardiac-specific overexpression has been recently related to a decline in synaptic vesicle exocytosis.

Initial data on neurogenesis and neuroinflammation in the hippocampus (2 Gy - 15 days post-irradiation) have also been collected at ENEA. Effects of PBI and TBI on hippocampal neurogenesis were very similar in terms of depletion of neural stem cell compartments of the subgranular zone, as detected by stage-specific markers of adult neurogenesis. Neuroinflammation analysis carried out in the hippocampus in Iba1-stained sections did not yield conclusive results. Further experiments using CD68 antibody (marker for activated microglia) at shorter time post-irradiation will be performed.

HMGU is responsible for the proteomics and bioinformatics analysis in WP2. Hippocampus of TBI or PBI mice two weeks after 0.1 Gy or 2.0 Gy X-ray doses were subjected to global proteomic profiling by label-free technology using LC/MS-MS. Each sample was analysed using a Q-Exactive HF mass spectrometer online coupled to a nano-RSLC. The acquired spectra were loaded to the Progenesis QI software for label-free quantification and analysis. Radiation-regulated proteins were determined by using the following criteria: identification with at least two unique peptides, ±1.5-fold dysregulation, p-value ≤0.05. Using this filtering criteria, 44 and 26 proteins were found to be deregulated in 0.1 Gy PBI and 0.1 Gy TBI, respectively,

while 42 and 132 proteins were deregulated in 2.0 Gy PBI and 2.0 Gy TBI, respectively. Importantly, proteomic profiles of all groups showed a significant upregulation of 11 proteins independent of radiation dose or condition (TBI or PBI). Among these 11 proteins were NMDA receptor subunit proteins GRIN1, GRIN2A, GRIN2B along with their associated postsynaptic membrane protein units and cognition-related synaptic regulators - SHANK proteins 1, 2, and 3. The pattern is consistent with an alteration in excitatory signalling in hippocampus thus representing a possible increase in neuronal excitability and long-term potentiation.

The Ingenuity Pathway Analysis predicted the activation of brain-derived neurotrophic factor (BDNF) and fragile X mental retardation 1 (FMR1) but inactivation of amyloid precursor protein (APP) in all conditions. In addition, the profile of differentially regulated proteins suggested the radiation-induced activation of CREB signalling. To validate the alterations in regulatory and synaptic long-term potentiation pathways, immunoblotting and targeted transcriptomics including 84 genes of the aforementioned pathways are being performed.

Furthermore, an integrative analysis from proteomics (HMGU) and miRNA data (ENEA) originating from the TBI and PBI (2 Gy) hippocampus is being conducted. Preliminary data suggest that miR 1-3p, miR 133a-3p, and miR 155-5b play a role in the direct radiation effect whilst miR 122-5p, miR 126a-3p, miR 126a-5p, miR 127a-5p, miR 133a-3p, miR 143-3p, miR 155-5p, and miR 199a-3p are important central regulators of the abscopal effect in the hippocampus.

OBU is involved in WP1 (Partial-body irradiations and Dosimetry) and in WP3 (Radiation signalling between tissues). For WP1, two pilot experiments were conducted in order to optimise the microvesicle and exosome isolation methods. Brain, heart and liver mouse tissue organ were received from ENEA. Three different methods of extraction were used for exosome's isolation and analysis, these include, ultracentrifugation, chemical/EV column, and Viva Spin Column. The results of this first pilot study showed that ultracentrifugation's method resulted in the highest yield of exosomes.

During the kick-off meeting, there were suggestions from the advisory board members for different extractions methods, including: 1) extraction the exosomes from homogenizing organ's tissues and 2) from the supernatants of organ tissues post culturing for two rounds of incubation (24 h each). Therefore, a second pilot study was set up. OBU has received from ENEA brain, heart, and liver tissue samples after homogenization, and these were processed according to the board suggestions. The ultracentrifugation method for exosomes extraction from these organ tissue conditions was implemented and the exosomes analysis (in terms of concentrations and size) showed that incubating the tissues for more than 24 hours and collecting the supernatant twice results in a) the media becoming acidic, b) observed damaged/broken cells, and c) decrease in the overall exosome concentration, presumably due to the acidity of the media or the enzyme activities.

Therefore, a decision was made to use frozen tissue that can give a very good yield of exosomes, as long as they are frozen and thawed correctly, as has been proved by OBU method of exosome extraction. This method can be considered as the optimum method compared to the other two. Following on the above final optimisations of exosomes extractions, OBU received further samples from ENEA that included brain, liver and heart of both 0 and 2 Gy TBI and PBI mouse organs post two weeks exposure. The exosomes concentrations and analysis results showed increased exosome concentrations in brain, liver and heart of both 2 Gy TBI and PBI mouse compared to 0 Gy (control) group. However, exosome concentrations in PBI mouse organs show more dramatic increase compared to TBI mouse organs. In summary: liver had the highest yield of exosomes, brain had a moderate yield, and the heart had the lowest yield of exosomes. Exosomes samples from all the organs were shipped to each partner according to their request.

For WP3 (task 3.2: In vitro functional effects): OBU used non-irradiated mouse bone marrow received from ENEA for the in vitro functional assays as discussed at the kick-off meeting. These included culturing and

expanding bone marrow stem cells populations in order to have sufficient samples to be used by OBU and TU Dublin for their WP3 tasks. Bone Marrow Cells were analysed in vitro for γH2AX using Flow Cytometry. Due to the presence of different subpopulation of cells in the bone marrow suspension culture (9 lineages-stem cells constitute 1-2 %), cells showed different auto fluorescence. Therefore, it was decided to work with adherent stem cells only. However, due to limited stem cell number in bone marrow (less than 1%) it was decided to use mouse embryonic fibroblasts (MEFs) for the functional assays. MEF cells were cultured, propagated successfully and used for the functional assay experiments. Results showed: 1) Increased DNA damage with 2Gy TBI and PBI liver exosomes treated MEF cells; 2) Slight increase in adhesion to fibronectin for 2Gy TBI and PBI liver exosome treated cells. Also, several frozen vials from MEF cells were sent to TU Dublin for their tasks.

Several experiments are ongoing, including: a) Western Blot for Exosome Markers (CD63, TSG101) & contaminants (GM130); b) RNA isolations from exosomes; c) MEF cells treated with exosome samples from brain and heart are subjected to the determined functional assays.

Finally, other challenges that need to be addressed include the exosome's number that needs to be increased for some of other partners. Once OBU receives further tissue samples in early 2019, exosomes will be isolated and distributed as needed.

TU Dublin is responsible for Task 2.3 Metabolomics / Raman spectral analysis within WP2. For this task 2.3, TU Dublin initially received formalin fixed paraffin preserved tissue blocks and sections from brain, heart and liver from ENEA for a pilot study to optimise the methodology. Raman spectra were recorded from each of the tissue types using a HORIBA Jobin Yvon XploRA Raman microscope with a 532 nm laser as source. Raman spectroscopic data was pre-processed (normalisation, baseline subtraction etc.) using in-house developed protocols within the Matlab (The Mathworks Inc.) environment. Good quality Raman spectra of the brain tissue sections could be achieved but blood contamination of the liver and heart tissue sections prevented good quality Raman spectral acquisition because of the overwhelming Raman signal from haemoglobin in these tissues. Further pilot studies at TU Dublin with fresh heart tissue established that the blood contamination issue could be resolved using a hydrogen peroxide pre-treatment of frozen tissue sections. Therefore, it was decided to change the sample preparation approach to OCT embedded tissue. Two sets of OCT embedded brains, hearts and livers were then received from ENEA from mice at 6 months and 15 days post irradiation. Recording of the heart tissue sections from mice 6 months post irradiation has been completed, 0Gy, 0.1 Gy (PBI and TBI) and 2 Gy (PBI and TBI). As before, Raman spectral maps were recorded from each heart tissue section using a HORIBA Jobin Yvon XploRA Raman microscope with a 532 nm laser as source and data was pre-processed (normalisation, baseline subtraction etc.) using in-house developed protocols. Initial analysis of the multivariate data has been performed using partial least squares discriminant analysis (PLS-DA) within the Matlab environment and shows clustering of the Raman spectral data into unirradiated, PBI and TBI groups. Recording of the brain tissue sections from mice 15 days post irradiation is currently underway, 0Gy, 0.1 Gy (PBI and TBI) and 2 Gy (PBI and TBI).

TU Dublin (former DIT) also participates in Task 3.2 'In vitro functional effects' within WP3. For this task, TU Dublin received from OBU isolated exosomes from brain, heart and liver from mice at 15 days post irradiation. While waiting to receive cells from OBU for the live cell imaging and Raman spectral analysis, it was decided to carry out a Raman spectral analysis of the isolated exosomes. A small portion of the exosome pellet from the liver and brain samples was transferred to a microscope slide under sterile conditions. No visible pellet could be seen for the heart samples. Raman spectra were recorded from each exosome sample using a HORIBA Jobin Yvon HR800 Raman microscope with a 532 nm laser as source, data was pre-processed, and the multivariate data has been analysed using principal components analysis-linear discriminant analysis (PCA-LDA). Good clustering of the Raman spectral data into unirradiated, PBI and TBI groups was observed for isolated exosomes from liver and brain.

Administratively, all steps have been handled smoothly, including signature of the Grant Contract, preparation and signature of the Consortium Agreement with entry into force on March 31st 2018, the first financial reporting, etc. A co-funding contract between ENEA and TU Dublin has been prepared and signed on July 31st 2018, and will be the legal instrument employed as the basis for financial support from ENEA to TU Dublin.

Milestones and Deliverables

The project has fully achieved its objectives and milestones for the period. All expected Deliverables were submitted without delays and approved by the EC. The due Milestones were achieved, as confirmed during the first annual meeting in Dublin, 13-14 December 2018.

D9.123 Completion of PBI/TBI (M40)

Task 9.8 SHAMISEN-SINGS

SHAMISEN-SINGS, built upon the recommendations of the EC-OPERRA funded SHAMISEN project, aims to enhance Citizen Participation in preparedness for and recovery from a radiation accident through novel tools and APPs to support data collection on radiation measurements, health and well-being indicators.

The specific objectives are to:

1) Interact with stakeholders to assess their needs, and their interest in contributing to dose and health assessment, and evaluate how new technologies could best fulfil these needs. Consider lessons from current issues in Fukushima related to lifting evacuation orders and medical care for vulnerable population;
2) Review existing APPs for citizen-based dose measurements, and establish minimum standards of quality;
3) Review existing APPs/systems to monitor health and develop a core protocol for a citizen-based study on health, social, and psychological consequences of a radiation accident;
4) Build upon existing tools to develop the concept/guidelines for one or more APPs that could be used for:
   - monitor radiation to empower affected population and to contribute to radiation assessment of an accident's consequence, including visualisation of radiation conditions;
   - log behavioural and health information to be used, with appropriate ethics and informed consent, for citizen science studies.
   - provide a channel for practical information, professional support and dialogue.
5) Assess the ethical challenges and implications of both the APPs and citizen science activities through a consensus workshop.

The project started in month 29 of CONCERT. The progress between June 2018 and February 2019 (M37-45) is presented below:

Subtask 9.8.1. Stakeholders' needs

The objectives, status and goals of the stakeholder consultations of the different project is complete. This has involved establishing contact with the other projects, attending other projects meetings and discussing within the consortium with those involved in some of these other projects to maximise the complementarity of the projects.

The protocol for the stakeholder survey was finalised and ethics approval was obtained where required (Japan). The stakeholders questionnaires (translated into the official languages of the SHAMISEN SINGS participating countries: English, French, Italian, Japanese, Russian, Spanish and Ukrainian,) were made

available on the SHAMISEN-SINGS website (http://radiation.isglobal.org/index.php/en/stake-survey), through links, scannable QRs and a news item was published "SHAMISEN-SINGS Surveys on stakeholders needs: Your Voice is also Important!" in the ISGlobal blog, with links to the questionnaire in all languages and printed leaflets.

Concerning the general public, the questionnaire focused on three distinct population groups: those living far from power plants, those living in communities surrounding power plants and, in Japan, Belarus and Ukraine, those living in communities affected by the Fukushima Chernobyl accidents). The target audience and means of reaching them varied between countries (e.g. through universities, citizen associations and other convenient sampling frames in the countries). The age range of participants was very broad (from young people of 18-21 y.o. to retirees) and included both men and women. Professionals in Radiation Protection, and various professional categories, as well as mayor associations were also targeted, through conferences, meetings and mailings.

The preliminary descriptive results of the Survey – based on the English version of the questionnaire, were presented in D9.130 (delivered in month 37 instead of 31 due to delays in finalising the questionnaire in all languages and optimising the approach to conduct the survey in each country) and presented during the ERPW2018 in Rovinj, Croatia.

The results of more detailed analyses of all data collected (with open answers translated into English and checked) will be shown during various European Conferences in the coming months: NERIS workshop 2019, RICOMET and ERPW2019.

Based on the results of the survey and of WPs 2 and 3, an international stakeholder meeting will be held on 2 July 2019, at the time of the RICOMET conference in Barcelona, in order to present and obtain feedback on the proposals for the types and content of the APPs and/or devices arising from WP4. Before that, a meeting on Ethical issues related to use, and exploitation of data, from Apps and devices for dosimetric and health surveillance and communication will be held, within SHAMISEN SINGS in Oslo in May 2019.

Subtask 9.8.2 - Citizen participation in radiation measurements

In parallel to the work conducted in a ST9.8.1, partners of ST 9.8.2 have been busy collecting information and, in where relevant, testing existing devices and applications for citizen dose measurements. A meeting was held among SHAMISEN-SINGS, CONFIDENCE and PREPAREDNESS (EURAMET) participants involved in the analysis and performance testing of connected mobile devices and APPs for radiation measurements to ensure sharing of information, coordination of measurements thus ensuring complementarity of the work and avoiding duplication. All relevant information is up-loaded in the SHAMISEN SINGS Intranet provided sharing point area.

Work in ST 9.8.2 has been completed – except for activity counting, which is proving to be problematic, as expected – and D9.133 was submitted in September 2018.

WP2 held another working meeting during the February EURADOS meeting, on the results of testing 10 mobile Apps (purchased within the project) and a discussion of the parameters measured and strengths and weaknesses of the APPs. The meeting is also an opportunity to distribute the Subtask 9.8.1 Stakeholder Survey among EURADOS and related participants in order to obtain feedback from a different professional group of stakeholders.

Subtask 9.8.3 – Citizen Participation in health and well-being monitoring

Partners in this subtask have also been conducting work in parallel to ST9.8.1 and ST9.8.2, sending to FMU information about existing applications and questionnaires related to health and well-being as well as other tools, such as websites, that provide information about health.

A list of useful tools on health measurements was done based on lessons learned from Fukushima accident, and mobile application tools based on reviewing articles of key word regarding m-Health/e-Health. The "Worldwide well-being index tool" (WHO-5) was considered as appropriate for monitoring well-being. It was

discussed also what kind of effective questionnaires are more appropriate to use are and how to select them. FMU partners gathered information about activities (and their impact) related to health and well-being performed after the Fukushima accident. This determined the information that could be collected and provided using a digital (Apps or devices) platform. Results of this work presented deliverable D9.132 (delivered on time in June 2018, M37).

Subtask 9.8.4 Concept and specifications of App(s) and/or tools

The logistic and organization of this subtask had to be revised as one of the originally foreseen partners, which was to lead this subtask, moved to an institute in Luxemburg. Work was taken over by ISGlobal, with some collaboration with IRSN. An van Nieuwenhuyse, who was initially going to lead this subtask, has agreed to collaborate as an expert and participated in a meeting, held at ISGlobal, Barcelona, on the 29th of January 2019, to review the results of subtasks 9.8.1-9.8.3 and brainstorm on the organisation, timing and responsibilities, of subtask 9.8.4.

Further discussion between ISGlobal and IRSN on the organisation of WP4 is foreseen in the near future and a meeting of the SHAMISEN SINGS Partners involved in this task will be held in conjunction with the stakeholders workshop on Ethics in Oslo, 22nd of May 2019.

Subtask 9.8.5 Coordination and Dissemination

Work in ST9.8.5 during their reporting period consisted in the organisation of meetings and conference calls, coordination of work between work packages and the setup of the SHAMISEN SINGS website and share point.

In terms of dissemination, the following scientific communications were presented by SHAMISEN SINGS Consortium members at international and national conferences during the reporting period:

- **ISEEH** (Budweis, Check Republic, September 2018)- Invited Oral Presentation by Liudmila Liutsko: Liutsko, L., Sarukhan, A., Cardis, E.; SHAMISEN SINGS Consortium. Citizen's participation in post-accidental recovery: "citizens in science" for dose measurements, improving health and well-being.
- **RICOMET** (Antwerp), June 2018:
  - Oral presentation: Liutsko, L., Sarukhan, A., Cardis, E. for the SHAMISEN SINGS Consortium. New technologies for public service: Would their use help engage people in radiation protection and preventive health behaviour?
  - Poster with short oral presentation: Liutsko, L., Sarukhan, A., Oughton, D., Fattibene, P., Della Monaca, S., Chumak, V., Goto, A., Lyamzina, Y., Pirard, Ph., Novikava, N., Nieuwenhuysen, A., Tomkiv, E., Charron, S., Maître, M., Croüail, P., Schneider, T., Cardis, E.; SHAMISEN SINGS Consortium (2018, June). The Questionnaire on Exploring People's Needs on Apps (mobile applications) for dose measurements & health/well-being related to radiation exposure (WP1 SHAMISEN SINGS project) (SHAMISEN SINGS project). RICOMET, Belgium: Antwerp.
- **ERPW2018 (**(European Radiation Protection week), Croatia: Rovinj, October 2018) - oral presentations:
  - Oughton, D. Societal and ethical challenges of health monitoring strategies.
  - Liutsko, L., Sarukhan, A., Fattibene, P., Della Monaca, S., Charron, S., Barquinero; J.F., Chumak, V., Ohba, T., Tanigawa, K., Lyamzina, Y., Goto, A., Tomkiv, Y., Oughton, D., Pirard, Ph., Novikava, N., Maître, M., Croüail, P., Schneider, T., Van Nieuwenhuyse, A. & Cardis, E. The SHAMISEN SINGS project– stakeholders' involvement in generating science (radiation protection)
  - Fattibene, P., Della Monaca, S., Liutsko, L., Trompier, F., Barquinero, J., Barrios, L., Bottollier JF, Depois, J.F., Challeton-de Vathaire, C., Chumak, V., De Angelis, C., Franck, D., Nuccetelli, C., Ohba, T, Tanigawa, K., & Cardis, E. A review on 5 existing apps for citizen based dose measurements.

  A presentation of the SHAMISEN SINGS project and work in progress was also made in the CONCERT session and stakeholders meeting for feedback.

- **Presentations in Italy to international and national congresses:**
  - Della Monaca, S. et al. (September, 2018). Valorizzazione della partecipazione dei cittadini nelle fasi di preparazione e ripristino di un incidente radiologico: i progetti SHAMISEN E SHAMISEN-SINGS, Italian Society for Radiation Research (oral).

  - Della Monaca, S. et al. (October, 2018). Valorizzazione della partecipazione dei cittadini nelle fasi di preparazione e ripristino di un incidente radiologico: review e test sperimentali di app e dispositivi per l'auto misurazione della dose (oral - SMD). Italian Association Radiation Protection, Rome.
  - Fattibene, P. et al. (November, 2018). A review on existing apps for citizen based dose measurements. 4th international CBRNE workshop, Italy: Rome (poster), web: https://sievertacademy.com/iw2018/

- **Presentation in Japan (international symposium):**
  - Ohba, T. et al. (February, 2019). SHAMISEN-SINGS project: Review of mobile phone applications for citizen health and well-being assessment following the Fukushima accident, The 2nd International Symposium of the Network-type Joint Usage/Research Center for Radiation Disaster Medical Science, Nagasaki, Japan.

- Information about SHAMISEN SINGS was provided at a stakeholders workshop organisation meeting in Madrid within CONFIDENCE, 27 of June 2018, CIEMAT, Madrid; as well as during a workshop for local stakeholders "Preparedness to Nuclear and Radiological Emergencies: Keys for Improvement", organised by SERP (Spanish Society for Radiological Protection) in collaboration with UPM, CIEMAT and ISGlobal, 21st of September 2018 in Madrid, UPM.

- A technical note was published on SHAMISEN SINGS in the ERPW2018 journal: Liutsko L, et al. Shamisen Sings project – stakeholders involvement in generating science (radiation protection). *Arh Hig Rada Toksikol* 2018;69: 349-350.

Apart from the various Subtask and Stakeholder meetings described above, the final SHAMISEN SINGS consortium meeting is planned to be held in conjunction with the next ERPW in Stockholm in October 2019. Proposals for the APPS, devices and for management and protection of data that would be collected will be discussed by the Consortium taking into consideration the feedback from stakeholders at various meetings during the year. This will be the basis for the final report and deliverables of the project.

In the meantime, partners will take advantage of other meetings, such as the NERIS workshop and RICOMET meeting to organise small working group discussions.

Milestones and Deliverables

D9.130 Stakeholder consultation report with needs, requirements for future tools – submitted (M37)
D9.132 Review of applications for citizen health and welfare assessment – submitted (M37)
D9.133 Review of applications and devices for citizen dose measurement – submitted (M40)

Task 9.9 VERIDIC

VERIDIC project has officially started on February 1st and the kick-off meeting took place on February 4th. During the past 9 months, the following activities were performed:
The project officially started on 1st February 2018 (CONCERT M33).

Two projects meetings were organised, in Barcelona, Spain, on 10th and 11th October 2018, and in Lodz, Poland, on 11th February 2019.

The project was presented in three sessions of the European Radiation Protection Week (ERPW2018) in Rovinj, Croatia, between 1st and 5th October.

Task 9.9.1 Harmonisation of skin dose reporting

Within subtask 9.9.1.1, a complete list of parameters necessary to calculate the maximum skin dose (MSD) and the 2D-skin-dose distribution was established. A review of the software products enabling calculation of the MSD was performed from literature and contacts with the manufacturers and developers. Eighteen software products were considered; for thirteen of those sufficient data was obtained to perform the review. Within subtask 9.9.1.2, the availability of the parameters mandatory for MSD estimate was evaluated within the radiation dose structured reports (RDSR) from the four manufacturers of angiographic units. In addition, the completeness of the RDSR data as extracted by two prominent dose management software tools was assessed. Recommendations for harmonization of the RDSR were formulated.

Task 9.9.2 Commissioning and quality control protocol for skin dose calculation software

Within subtask 9.9.2.1, dosimeters commonly used in interventional cardiology (IC) are being characterised and calibrated for a wide range of conditions specifically encountered in IC, leading to a better uncertainty quantification of skin dose measurements.

- Standards for four beams qualities representative of clinical beams used in the participating centres were established at CEA. Standards will be transferred to VINCA.
- In parallel, angular and dose rate response of solid state dosimeters (multimeters) commonly used in clinics were tested at VINCA. Thermoluminescent dosimeters were tested too. Results are currently being analysed.

Within subtask 9.9.2.2, a first version of the acceptance test protocol was developed. This protocol was tested on a Canon angiography system as part of subtask 9.9.2.3. Solid-state dosimeters (multimeters), gafchromic films and thermoluminescent dosimeters were used. Results are currently being analysed and will be used to amend the acceptance protocol. Additional tests are foreseen on other angiography systems in the coming months.
Subtask 9.9.2.4 has not started yet.

Task 9.9.3 Investigation of skin dose determinants and optimisation of medical practice

Within subtask 9.9.3.1 a database of RDSR/dose reports and medical data of high-dose cardiac procedures is being established. The data collection is ongoing in 13 hospitals from 8 European countries, including more than 20 angiography units. So far, 533 procedures have been collected.
Though the data collection is not complete yet, preliminary statistical analysis of data samples was performed within subtask 9.9.3.2.

Milestones and Deliverables

A first version of the Acceptance and Quality control protocol was drafted and is currently being tested. Standards for digital dose reporting were proposed and incorporated in the report summarising WP1 activities (D9.141 Standards for digital dose reporting) which was delivered on time.

D9.141 Standards for digital dose reporting (M42)

No other milestones or deliverables were planned during this reporting period.

ANNUAL WORK PLAN FOR THE FIFTH YEAR (M49-60)

Annex 7

to the EJP Grant Agreement

(Annual Work Plan for month 49 to 60)

1st June 2019 – 31st May 2020

CONCERT

European Joint Programme

For the Integration of Radiation Protection Research

CONTENT

1 Coherence with Annex 1

AWP objectives for month 49 to 60

The consortium aims to continue its work done in the first 48 month of the project on developing a sustainable structure for promotion and administration of joint programming and open research calls in the field of radiation protection research for Europe. The CONCERT EJP supported the establishment of strategic research agendas in the different sectors of radiation protection research by the respective research platforms. In its final year CONCERT will continue to build and to improve the radiation protection research structure in Europe on the foundations laid out by (I) these strategic research agendas developed and regularly updated by the respective research platforms MELODI, ALLIANCE, NERIS and EURADOS and EURAMED, (II) the vision and the activities performed as in the previous years to further integrate national and European research programmes for radiation protection by co-funding, and (III) the further participation of national programme owner and programme manager institutions in a European research consortium. A platform in the field of social sciences and humanities (SSH) is in the state to be founded. CONCERT is actively supporting this development and integrating SSH in its research strategies as already done in the second open RTD call.
Activities of the consortium will go on to focus on one side on the aspects of support to develop an integrated landscape for radiation protection research in Europe and on the other side to directly fund coordinated research projects in an open, fair and transparent manner dedicated to state of the art science and tailored to the radiation protection needs of the society, authorities and stakeholders. Integration of education and training in the research agenda as well as optimal access to research infrastructures in Europe and even beyond are essential for the consortium.
The set of activities described in the Fifth Annual Work Plan serve the overall consortium aims by supporting the on-going work of the research platforms in establishing and updating the respective SRAs, in recommending research priorities and developing research roadmaps.
In addition, CONCERT builds on established procedures in OPERRA and the experience gained in the past years and will extend them to joint programming with research priority setting for the entire field of radiation protection research. A first preparatory document for a Joint Roadmap represents the first steps and current ideas to build a joint roadmap for radiation protection research (D3.4). Since the joint roadmap is meant to be a guide to plan research and develop radiation protection tools for the benefit of the society the preparatory document will serve as a basis to initiate discussions with the wider research community and other stakeholders.
Projects funded in the two CONCERT calls will be followed-up in the last year of CONCERT. Information collected is used to determine whether the projects have reached satisfactory completion.

Expected impacts

The set of activities described in the Annual Work Plan Month 49 to 60 will continue with all the activities in the rolling work-flow programme as set up in the past three years focusing on the updating of Strategic Research Agendas (SRA), priority setting for research in each of the radiation protection areas, the further development of a joint research road map, as well as on the follow-up of projects funded on the two open RTD calls. Although almost all EU countries plus Norway and Switzerland have joined forces to combine their expertise and research activities in order to improve radiation protection in all fields of application of ionising radiation and radioactive substances in medicine, industry and research, CONCERT is still open for new Programme Owners and Managers from EU Member States to take part and to integrate their research priorities and needs in the EJP.

It is the vision of CONCERT to bring together the major radiation protection research platforms in Europe, to maximise integration and coordination of research efforts in all EU Member States in joint research programmes, to identify and to prioritise radiation protection research and E&T needs using state of the art methodologies, techniques and approaches and provide strategic direction and leadership.

WP1

The activity of WP1 is intended to be a comprehensive coordination of all activities of the project with the intention of achieving the desired objectives. The coordinator will continue to call for ExB, MB and ESAB meetings in the fifth year as necessary for the management of the project, in particular for follow up of research projects funded through the two CONCERT open calls, education and training activities, on strategies for future research, dissemination activities and on new members joining the CONCERT consortium. Furthermore, the coordinator will continue the interaction with the EC concerning reporting and Grant Agreement updates. Experience from the previous four years will be used to further optimise and improve the CONCERT internal information and work flow between work package leaders and all CONCERT beneficiaries on one side and the coordinators of the funded projects on the other. WP1 is further strengthening contacts and joint research between the projects and promoting networking. The main coordination tasks will be to organise the successful completion of the nine funded projects, the final meeting, and particularly, to collect all necessary material for the last annual reporting and final reporting both month 60.

WP2

The research platforms play an important role in WP2. They will be stimulated to continue and update their ongoing work on the SRA and the roadmaps. CONCERT builds its integration activities on the continuous work of the platforms in the fields of SRA, Infrastructure and E&T, as well as on the collaboration between the platforms and the extension to the medical field and social sciences and humanities. WP2 will set up support activities for the platforms for sustainable input into joint programming. The platforms continue developing their long-term roadmaps and evaluate the impact of draft joint roadmap scenarios on SRA. Meetings will be organised with stakeholders in the medical scientific community and stakeholders in social sciences and humanities will be consulted.

WP3

The main task of WP3 for the 5th year will be to summarise the comments on the draft joint roadmap for radiation protection research made by various stakeholders on national and European level and beyond. The expected impact is that research programming will be better aligned with the needs of the end users such as regulators and practitioners. Efforts will be done to align the individual and joint roadmaps. A first joint roadmap for radiation protection research is planned for end 2019, to enable to set priorities and plan the research over a long term (~20 years) along with a decent resource plan, e.g. to fund a long-term call planning.

WP4

In the fifth year of the EJP CONCERT, WP4 will continue the follow-up and monitoring of the nine research projects funded in the two CONCERT calls. The JCS will carry out this phase directly with the granted project coordinators for information delivery, reporting request and reporting analysis. Non-confidential results of the CONCERT funded projects' follow-up and assessment will be presented to the CONCERT MB.

The follow-up will be closed in March 2020. WP4 will organise a final evaluation of funded research proposals. The evaluation will be based on two different steps: the evaluation of the final scientific reports and the presentations given by the projects representatives at the final meeting of CONCERT, to which the reviewers will be invited. The assessment reports on the follow-up (D4.3 and D4.6) of WP4 will contain the written reports on the evaluation given by the review panel. This final evaluation will provide the EJP CONCERT with an external feedback and analysis of the success and impact of research projects funded.

WP5

In the course of the fifth project year, CONCERT will continue its stakeholder engagement activities. Key activities will be further meetings of the stakeholder group, completion and dissemination of an analysis of the stakeholder survey and further refinement of the CONCERT website public-facing content. It is hoped that the activities will further raise awareness of radiation protection research issues and widen the inputs into developing research priorities over the project life.

WP6
For the fifth year of the project, WP6 will complete the ongoing task of facilitating access to infrastructures in Radiation Protection Research by promoting the visibility of selected infrastructures through the bulletin AIR2 and the database AIR2D2. Several promoting activities are planned (flyer, meetings, presentations etc.). WP6 will also focus on Education and Training on Research Infrastructures, Competitive Access so that the infrastructures can be selected for funding, Harmonization and Standardization of the practices/protocols (intercomparisons) and finally, data sharing and open access through the continuous work of STORE in building submissions and engaging in outreach activities.

WP7
E&T is seen as an integral part of excellence and sustainability of science in radiation protection. Experience from courses and other training activities carried out in the first four years of CONCERT will be used to call for new courses and other training activities in the fifth year.

WP9
CONCERT successfully finished its two open calls for proposals to support multidisciplinary and transnational research projects. Projects selected through the calls, three projects in call 1 and six projects in call 2, were kicked off. Assessing the progress achieved within these projects, along with the progress made with regard to other CONCERT activities, will enable to determine what are the gaps and missing tasks/activities, in order to realise the full potential and objectives of the future respective research in the radiation protection area. There is no doubt that very interesting results will be produced by all projects in the remaining last year of this EJP.

Correspondence with the Description of Work - Annex 1

The added work package “WP9” brings together RTD activities selected through the two open calls for research projects organised along the CONCERT project. As a result of the two open transnational call for proposals on “Radiation Protection Research in Europe” through the EJP CONCERT, launched in 2016 and 2017, nine projects are forming now the tasks of the WP9.

1.1.1 WP1

The primary activity of WP1 during month 49 to 60 of the CONCERT EJP is to accompany the progress towards successful termination of the nine funded projects resulting from the two open CONCERT calls and CONCERT itself, to promote the individual SRA update of the five research platforms and the SSH respectively, to assist the successful set up of the joint roadmap and to prepare the last Periodic Report as well as Final Report to the EC in month 60.

1.1.2 WP2

One of the main inputs from the research platforms MELODI, ALLIANCE, NERIS, EURADOS and the newly established EURAMED in the CONCERT EJP are their respective sectorial SRA, research priorities and road maps. These are developed and updated regularly. In month 49 to 60 of the CONCERT EJP the research platforms will prepare the final updates of SRAs by month 54 and continue their work on long-term roadmaps. Research perspectives of social sciences and humanities on radiation protection research as a whole are also addressed by CONCERT.

1.1.3 WP3

The fifth year is crucial to finalise the first final version of the joint roadmap for radiation protection research. Stakeholder consultation on the draft roadmap will be continued through a number of video conference meetings with the WP5 stakeholder group.

1.1.4 WP4

In the fifth year of the EJP CONCERT, WP4 will continue the follow-up and monitoring of the nine research projects funded in the two CONCERT calls (three projects in call 1 and six projects in call 2). The JCS will carry out this phase directly with the granted project coordinators for information delivery, reporting request and reporting analysis. Non-confidential results of the CONCERT funded projects' follow-up and assessment will be presented to the CONCERT MB.

The follow-up will be closed in March 2020. WP4 will organise a final evaluation of funded research proposals.

The evaluation panel will consist of 4-6 international experts that participated already in both or at least one CONCERT call as reviewer. The evaluation will be based on two different steps: the evaluation of the final scientific reports and the presentations given by the projects representatives at the final meeting of CONCERT, to which the reviewers will be invited. This allows a direct exchange between the reviewers and the project representatives and gives to the reviewers the possibility to direct questions to the funded project teams and to provide recommendations. The assessment reports on the follow-up (D4.3 and D4.6) of WP4 will contain the written reports on the evaluation given by the review panel. This final evaluation will provide the EJP CONCERT with an external feedback and analysis of the success and impact of research projects funded

1.1.5 WP5

In the fifth year of CONCERT WP5 will concentrate on continuing to bring the Stakeholder Engagement Strategy to life. In particular, efforts will focus on embedding the Stakeholder group and developing routes for the stakeholder group's voice to impact upon CONCERT. During the third meeting of the Stakeholder Group, some next steps had been proposed and validated by all, as for example the organisation of regular web-conference meetings to discuss the Challenges proposed in the CONCERT Joint Roadmap for Radiological Protection Research, as well as to give updates from the CONCERT Projects. Conference dates planned on the reporting period are: 19 February,16 April, 11 June and 17 September 2019. It is also envisaged to enlarge the Group by identifying potential new members with the help of the European Research Platforms on Radiological Protection. Finally, a face-to-face meeting of the WP5 Stakeholder Group will be organised at the end of 2019.Detailed location and date of this meeting will be specified in the coming months. Additionally, the stakeholder survey report and analysis will be completed and results disseminated.

1.1.6 WP6

Access to state of the art infrastructures for radiation protection research (sometimes rare) is an important condition for scientific excellence. WP6 will promote the visibility of such infrastructures making them known to the community, and by helping to get access to them. During the last project year, the portal "Access to Infrastructures for Radiation protection Research Documented Database" (AIR^2D^2) will be continued as well as the regular publication of information about infrastructures in the bulletin AIR^2, and special issues. Actions to develop, to strengthen and expand the database STORE with past radiological experiments and stored biological material will be implemented. This type of work will be also developed with identified pilot infrastructures (exposure platforms) to increase the cohesion among infrastructures.

1.1.7 WP7

E&T is one of the corner stones for sustainable research in the field of radiation protection and for translational activities towards integration of scientific knowledge in professional daily routine. In parallel WP7 will continue to organise open calls for targeted E&T courses in prioritised research areas as identified by joint programming in WP3.

1.1.8 WP9

Activities implemented through calls for proposals will be performed. The work progress will be monitored to see if goals are met. The JCS of WP4 will requesting a brief mid-term and final scientific progress report of respective projects. In addition, project coordinators will be asked to present the project results during CONCERT meetings, submit deliverables in due time and to provide input to the main CONCERT reports.

Annual Work Plan Activities

Annual Work Plan

1.1.9 Structure of the Annual Work Plan

In its final year CONCERT will focus on maintaining the structures and procedures to manage and administer the EJP as the basis for a successful timetable of the CONCERT project as well as of the funded projects within the framework of CONCERT.

All CONCERT WPs are integrated into this cyclical work flow, which is in principle designed to start with an update of the joint strategic research agenda, the formulation of research priorities by joint programming and finally the funding and monitoring of research projects which fulfil all the requirements of scientific excellence and integration.
Cross-cutting through this cyclical workflow are WP dedicated to integrate activities which on one side have input through interfaces into the cyclical work flow and on the other side have the target for a sustainable support of radiation protection research. This principle work flows, one cyclical, and one more or less continuous are described in the CONCERT proposal. However, the same principles give the AWP a clear structure.

Activities in the AWP are listed as WP activities. Due to the large number of POM as CONCERT participants and many institutions actively involved in CONCERT activities as LTP in addition to the strong involvement of the research platforms with their large active membership a breakdown of the annual activities further down as WPs and Tasks results in low person-month involvement of some CONCERT participants and LTPs. However, the mission of CONCERT and the research platforms to encourage institutions to become active partners in radiation protection research in Europe make it necessary to plan for these active partners at least one meeting per year to interact and exchange information.

1.1.10 Timing of the different programmed activities and their components

"European Concerted Programme on Radiation Protection Research (Concert)": Timing of work packages and their components

		Project Year/Quarter of Project Year											
		Year 5											
		Q1			Q2			Q3			Q4		
		49	50	51	52	53	54	55	56	57	58	59	60
WP1:	**Project coordination & management**												
	meetings (kick-off, periodic meetings)												
Task 1.1:	Overall legal, contractual, administrative management and financial management												
Task 1.2:	Consortium, Executive and Management Board meetings												
Task 1.3:	Updating the rolling annual work plan												
Task 1.4:	External Scientific Advisory Board for the evaluation of CONCERT												
Task 1.5:	Negotiation of projects to be funded through CONCERT open research calls												
Task 1.6:	Funding decision process for integration activities listed in the approved annual work program												
Task 1.7:	Attracting new members to the CONCERT EJP Consortium												
Task 1.8:	Public CONCERT webpage and a secure internal web-based work space												
Task 1.9	Establishment of an expert database for the reviewing processes of CONCERT (MELODI; MB members)												
WP 2:	**Integration and SRA development in radiation protection research**												
Task 2.1:	Development of Strategic Research Agenda, roadmap and priorities for research on low dose risk												
Task 2.2:	Development of Strategic Research Agenda, roadmap and priorities for research on radioecology												
Task 2.3:	Development of Strategic Research Agenda, roadmap and priorities for research on emergency preparedness and response												
Task 2.4:	Development of Strategic Research Agenda, roadmap and priorities for research on dosimetry												
Task 2.5:	Development of Strategic Research Agenda, roadmap and priorities for research with the medical scientific community												
Task 2.6:	Creating a Strategic Research Agenda on Social Sciences and humanities in Radiation Protection												
Task 2.7:	Research and innovation supporting the implementation of the revised European Basic Safety Standards												
WP 3:	**Priority research and joint programming needs in the perspective of European Integration**												
Task 3.1:	Integration of SRAs and research priorities from research platforms and national programs												
Task 3.2:	Joint priority setting												
Task 3.3:	Joint roadmap development for a long term strategy of radiation protection research in Europe												
WP 4:	**Organization and management of CONCERT open RTD Calls**												
Task 4.1:	Setting up a joint Call Secretariat												
Task 4.2:	Preparation of the Open Call documents and launch of the call												
Task 4.3:	Implementation of the open call												
Task 4.4:	Monitoring of the calls and the funded projects												
WP 5:	**Stakeholder involvement and communication in radiation protection research**												
Task 5.1:	Strategy for public and societal stakeholder engagement												
Task 5.2:	Establish a stakeholder group												
Task 5.3:	Interaction with the civil society, including use of social media for stakeholder communication												
Task 5.4:	Development of general and specialist information for the CONCERT website												
WP 6:	**Access to infrastructures**												
Task 6.1:	Promote the visibility of selected research infrastructures												
Task 6.2:	Harmonize Practices and Protocols												
Task 6.3:	Strategy for Facilitating Access to infrastructure												
WP 7:	**Education and training**												
Task 7.1:	Attracting and retaining students and junior scientists into the Radiation Protection research fields												
Task 7.2:	Education and training as an essential part of dissemination and knowledge management within CONCERT												
Task 7.3:	Targeted E&T initiatives												
Task 7.4:	Coordination and collaboration on E&T policy and strategy												
Task 7.5:	European integration of junior scientist career development												
WP 8:	**Ethics**												
WP 9:	**Research projects selected through CONCERT open calls**												
Task 9.1:	CONFIDENCE												
Task 9.2:	LDLensRad												
Task 9.3:	TERRITORIES												
Task 9.4:	ENGAGE												
Task 9.5:	LEU-TRACK												
Task 9.6:	PODIUM												
Task 9.7:	SEPARATE												
Task 9.8:	SHAMISEN-SINGS												
Task 9.9:	VERIDIC												

1.1.11 Detailed work description:

1.1.11.1 WP1 Project coordination & management

Set of Activities Number	1					**Start date**	**M 49**
Set of Activities Title	Project coordination & management						
Participant number	**1**	4	3	5	24	29	25
Participant short name	**BfS**	ANR	SCK•CEN	DH-PHE	FCT	VUJE	IMROH
Person-months per participant	51	0.6	0.6	0.2	0.2	0.2	0.2
Participant number	27	30	31	8			
Participant short name	IFA	UT	RSC	MELODI	Σ all other MB members		
Person-months per participant	0.6	0.2	0,2	-	2,68		

Objectives

Task of WP1 is to coordinate the CONCERT EJP.

The main objectives of the fifth project year are:

The purpose of WP “Project coordination and management” is to ensure the most effective administrative and financial management of the consortium with a view to reaching a good synergy between the partners. The overall objective of the managerial organisation is to provide necessary structures for participatory and efficient decision-making and coordination of activities, fluent day-to-day management including flow of information and financing (including the establishment of contracts with CONCERT Grantee Consortia and CONCERT external contractors), reporting to EC, as well as providing support and guidance on consortium activities and support the project coordinators of CONCERT funded projects respectively.

Description of programmed activities

Task 1.1 – Overall legal, contractual, administrative management and financial management (BfS)

Key activities during year 5 are:

- Monitoring the compliance of beneficiaries with their obligations under the grant agreement
- Monitoring the progress of the project and review the deliverables and reports to verify consistency with the project objectives
- Collection of information from the partners about achievements in relation to the objectives every 12 months in order to ensure efficient follow-up of the project progress and proper reporting to EC.
- Updating the Grant Agreement as necessary.
- Administration of the EC financial contribution regarding its allocation between beneficiaries and activities, in accordance with the grant agreement and the decisions taken by the consortium.
- Keeping the records and financial accounts

Task 1.2 – Consortium, Executive and Management Board meetings (BfS, MB members**)**

Key activities during year 5 are:

- Organisation of periodic MB meetings in connection with reporting periods
- Organisation of regular ExB meetings.

Task 1.3 – Updating the rolling annual work plan (AWP) (BfS, MB members**)**

Key activities during year 5 are:

- no further AWP

Task 1.4 – External Scientific Advisory Board (ESAB) for the evaluation of CONCERT (BfS, MB members**)**

Key activities during year 5 are:

- Provision of all relevant materials and information to enable ESAB to carry out its tasks as described in the ToR
- Organisation of the annual ESAB meeting

Task 1.5 – Negotiation of projects to be funded through open RTD calls (BfS, ANR, MB members**)**

Key activities during year 5 are:

- no activities

Task 1.6 – Funding decision process for integration activities listed in the approved annual work programme (BfS, ExB members, MB members**)**

Key activities during year 5 are:

- Proposal by the coordinator and decision by the ExB on the funding of integration activities
- When it is suggested by the ExB that an integration activity be performed, in part or in total, by one or more external entities, the Coordinator launches a European public procurement procedure to identify and contract with such entities for the delivery of the required services
- Conclusion of contracts between CONCERT coordinator and course providers and grantees receiving travel grants as proposed by WP7

Task 1.7 – Attracting new members to the CONCERT EJP Consortium (IFA, BfS, FCT, VUJE, IMROH, RSC, UT**)**

Key activities during year 5 are:

- Establishment of links to national EURATOM contact points and institutions responsible for scientific and regulatory aspects of radiation protection to promote CONCERT integrative activities
- Invitation to new POMs from partner countries as well as new countries to join the CONCERT Consortium

Task 1.8 – Public CONCERT web page and a secure internal web-based work space (SCK•CEN, DH-PHE, BfS**)**

Key activities during year 5 are:

- Maintaining and updating the secure internal workspace
- Hosting the main CONCERT archive for the management of internal documents on the workspace
- Maintaining and updating the public CONCERT website.

Task 1.9 – Establishment of an expert database for the reviewing processes of CONCERT (MELODI; MB members**)**

Key activities during year 5 are:

- no activities

Deliverables

D1.5 Fifth periodic reports to the EC in accordance with the provisions of the consortium contract (M60)
D1.6 Final report of the consortium (M60)

1.1.11.2 WP2 Integration and SRA development in radiation protection research

Set of activities number	2	Start date				M 49
Set of activities title	Integration and SRA development in radiation protection research					
CONCERT Consortium Members						
Participant number	1	2	3	5	6	7	8
Participant short name	BfS	STUK	SCK-CEN	DH-PHE	CEA	UniPv	MELODI
Person-months per participant	4,5	1,99	4,5	1,45	0,6	2,1	-
Participant number	9	10	11	12	14	15	16
Participant short name	ALLIANCE	NERIS	EURADOS	IRSN	CIEMAT	NRIRR	MTAEK
Person-months per participant	-	-	-	3,67	1,4	1,5	0,5
Participant number	18	19	20	21	22	23	25
Participant short name	HMGU	MUW	ENEA	ISS	NRPA	RIVM	IMROH
Person-months per participant	1,7	0,2	0,54	0,8	0,6	0,2	0,4
Participant number	28	29	30	32	33	34	36
Participant short name	EEAE	VUJE	UT	UL	UEF	GIG	APA
Person-months per participant	0,1	0,6	0,2	0,2	4,0	0,13	0,33
Linked Third Parties							
LTP short name / linked to	DTU/ NERIS	MUTADIS/NERIS	UMIL/ NERIS	PTB/ EURADOS	IST/ EURADOS	RBI/ EURADOS	IFJ PAN/ EURADOS
Person-months per LTP	0,2	0,4	0,2	0,2	0,2	0,2	0,2
LTP/Participant short name	SL/ EURADOS	CEPN/ IRSN	SU/ MELODI	ISGlobal/ CIEMAT	KIT/ HMGU	HZDR/ HMGU	NMBU /NRPA
Person-months per LTP	0,2	2	0,2	0,4	1	0,5	0,2
LTP/Participant short name	CTU-FBME / SURO	NRI/ SURO	UJF/ SURO	UTA/ STUK	NCSRD EEAE	NTUA EEAE	RTU/ UL
Person-months per LTP	0,4	0,2	0,6	0,2	0,25	0,25	0,03
LTP/Participant short name	PDC-AGROS / DEMA	DMI / DEMA					
Person-months per LTP	0,25	0,25					

Description of programmed activities

Task 2.1 - Development of Strategic Research Agenda, roadmap and priorities for research on low dose risk (MELODI, BfS, MTA-EK, DH-PHE, HMGU, IRSN, STUK, ENEA; UEF, UniPv, CEA; LTPs: CTU-FBME, CREAL, SU, UEF)

Key activities during year 5 are:

- The MELODI SRA will be updated by month 54.
- The list of priorities based on the updated SRA is prepared by month 54. Subject to extra funding, this is input to Joint Programming (WP3).
- Developing long-term roadmap
- Evaluate the impact of draft joint roadmap scenarios on SRA

Task 2.2 - Development of Strategic Research Agenda, roadmap and priorities for research on radioecology (ALLIANCE, IRSN, SCK-CEN, BfS, STUK, HMGU, CEA, CIEMAT, UEF; LTPs: HZDR)

Key activities during year 5 are:

- The ALLIANCE SRA will be updated by month 54.
- The list of priorities based on the updated SRA is prepared by month 54. Subject to extra funding, this is input to Joint Programming (WP3).
- Developing long-term roadmap
- Evaluate the impact of draft joint roadmap scenarios on SRA

Task 2.3 - Development of Strategic Research Agenda, roadmap and priorities for research on emergency preparedness and response (NERIS, SCK-CEN, BfS, DH-PHE, VUJE, IRSN, CIEMAT, NRPA, STUK, UEF; LPTs: DTU, CEPN, KIT, MUTADIS)

Key activities during year 5 are:

- The NERIS SRA will be updated by month 54.
- The list of priorities based on the updated SRA is prepared by month42. Subject to extra funding, this is input to Joint Programming (WP3).
- Developing long-term roadmap
- Evaluate the impact of draft joint roadmap scenarios on SRA

Task 2.4 - Development of Strategic Research Agenda, roadmap and priorities for research on dosimetry (EURADOS, HMGU, IRSN, SCK-CEN, CIEMAT, DH-PHE, ENEA, ISS, CEA, UEF; LTPs: PTB, IFJ, SL, RBI, IST)

Key activities during year 5 are:

- The EURADOS SRA will be updated by month 54.
- The list of priorities based on the updated SRA is prepared by month 54. Subject to extra funding, this is input to Joint Programming (WP3).
- Developing long-term roadmap
- Evaluate the impact of draft joint roadmap scenarios on SRA

Task 2.5 - Development of Strategic Research Agenda, roadmap and priorities for research with the medical scientific community (UniPv, BfS, MUW, IRSN, NRPA, STUK, ISS, CEA, UEF; LTPs: CREAL, CTU-FBME)

Key activities during year 5 are:

- The EURAMED SRA will be updated by month 54.
- The list of priorities based on the updated SRA is prepared by month 54. Subject to extra funding, this is input to Joint Programming (WP3).

- Developing long-term roadmap.
- Evaluate the impact of draft joint roadmap scenarios on SRA
- Organising meetings with stakeholders in the medical scientific community.

Task 2.6 - Creating a Strategic Research Agenda on Social Sciences and humanities in Radiation Protection (SCK-CEN, BfS, IRSN, EEAE, ISS, NRPA, VUJE, IMROH, UEF; LTPs: MUTADIS, CEPN, NMBU, UNIMI, UEF)
This work is divided into three sub-task groups: 1) Ethics and justification 2) Risk communication and perception, and 3) safety culture.

Key activities during year 5 are:

- The list of priorities based on existing SRA is prepared by month 54. Subject to extra funding, this is input to Joint Programming (WP3).Organizing reflection groups with professionals and experts with expertise in social sciences and humanities applied in radiation protection-related topics.
- Meeting(s) of reflection groups interested in social sciences and humanities, with focus on ethics, risk perception and risk communication, and safety culture.
- Stakeholders in social sciences and humanities are consulted.
- Subject to extra funding, input to Joint Programming is provided by identifying joint research needs and priorities.

Task 2.7 – Research and innovation supporting the implementation of the revised European Basic Safety Standards (NRIRR, STUK, IRSN, BfS, VUJE, ISS, RIVM, IMROH, UEF, UT; LTPs: UJV, UEF)

Key activities during year 5 are:

- Contacts with Art.31 group and HERCA will continue and possibilities for joint activities searched. Feedback on long-term roadmap scenarios will be surveyed.
- The work for the identification of national level research needs will continue.
- Subject to extra funding, input to Joint Programming (WP3) is provided by identifying joint research needs and priorities.

Milestones
MS13 Annual SRA platform Statements and the SRA update 2019 (M54)

Deliverables
D2.13 Updating the SRAs of MELODI, ALLIANCE, NERIS and EURADOS (M54)

1.1.11.3 WP3 Priority research and Joint programming needs in the perspective of European Integration

Work package number	3											**Start date**			**M 49**
Work package title	Priority research and joint programming needs in the perspective of European integration														
Participant Number	1	2	**3**	4	5	6	7	8	9	10	11	12	13	14	15	16
Short name of participant	BfS	STUK	**SCK-CEN**	ANR	DH(PHE)	CEA	UniPv	MELODI	ALLIANCE	NERIS	EURADOS	IRSN	SSM	CIEMAT	NRIRR (OSSKI)	MTA-EK
Person-month per participant	0,60	0,1	**4,8**	0,02	1,45	0,44	0,44	0,00	0,00	0,00	0,00	1,50	0,02	0, 44	0,44	0,44
Participant Number	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Short name of participant	NCRRP	HMGU	MUW	ENEA	ISS	NRPA	RIVM	FCT	IMROH	SURO	IFA	EEAE	VUJE	UT	RSC	UL
Person-month per participant	0,35	0,44	0,05	0,6	0,14	0,14	0,14	0,00	0,02	0,2	0	0,02	0,02	0,02	0,02	0,0
Participant Number	33	34	37													
Short name of participant	UEF	GIG	JSI	DTU/ NERIS	MUTADIS/NERIS	UMIL/NERIS	PTB/ EURADOS	IST/ EURADOS	RBI/ EURADOS	IFJ PAN/ EURADOS	SL/EURADOS	CEPN/IRSN	ENSTTI/IRSN	SU/MELODI	ISGlobal/ CIEMAT	KIT/HMGU
Person-month per participant	0,47	0,13	0,33	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,,5	0,02	0,02	0,02	0,5
Participant Number																
Short name of participant	GSI/HMGU	FZJ/HMGU	HZDR/HMGU	Jülich/HMGU	NMBU/NRPA	CTU/SURO	NRI/SURO	IFIN-HH/IFA-MG	UTA/STUK	UJF/SURO	NCSRD/EEAE	RTU/UL	UTA/STUK	PDC-AGROS/ DEMA	DMI/DEMA	
Person-month per participant	0,02	0,02	0,02	0,02	0,25	0,04	0,32	0,12	0,2	0,4	0,03	0,02	0,2	0,08	0,08	
Participant Number																

Objectives

WP3 aims at joint programming for the entire field of radiation protection research, by developing joint research priorities and a joint long-term road map.

The main objectives of WP3 for the fifth year are:

1. Elaboration of a joint roadmap through stakeholder consultation
2. Proposal of a long-term research plan with according budget estimation

Description of Programmed Activities

Task 3.1 – Integration of SRAs and research priorities from research platforms and national programs (proposed lead: BfS; Partners: the representatives of the RP association, all CONCERT partners)
In the Grant Agreement, no funding is available for an additional open call, but the EURATOM Work Programme 2019-2020 has been recently published. This work programme contains topics related to further integration of radiation protection research in the EU.

Although this new EURATOM call provides extra funding, the platforms did not prepare a new gap analysis for the current D3.5, as a gap analysis was prepared in CONCERT D3.3 for the former EURATOM Work Programme 2018. However, the platforms MELODI, EURADOS, NERIS, ALLIANCE and EURAMED as well as experts in social sciences and humanities have continued their priority setting activities each individually and jointly. The current CONCERT projects are regularly followed up by the platforms and the WP leader, to assess the state of the art and the research needs, which are then implemented in the individual SRAs in WP2.

Task 3.2 – Joint priority setting (lead: SCK-CEN; partners: all CONCERT partners)

- No further activities are foreseen by lack of funding.

Task 3.3 – Joint roadmap development for a long term strategy of radiation protection research in Europe (lead: MELODI; partners: ALLIANCE, EURADOS, NERIS, all CONCERT partners)

Key activities during year 5 are a continued consultation of stakeholders (with meetings foreseen until September 2019) and the finalisation of the joint roadmap. Options to align the individual and joint roadmap will be investigated and potentially implemented.

Deliverables

D3.7 Second joint Roadmap (M48)

1.1.11.4 WP4 Organization and management of CONCERT open RTD Calls

Set of Activities number	4	**Start Date or Starting Event**			**M 49**
Set of Activities Title	Organization and management of CONCERT open RTD Calls				
Participant Number	4	13	26	35	
Short Name of Participant	**ANR**	SSM	FCT	MINECO	
Person-months per Participant	3	0,8	0,8	0,33	

Objectives

WP4 will administer the CONCERT open research call process and the follow-up of projects funded.

The main objectives of the fifth project year are:

- The follow-up of projects funded in the first and second CONCERT open research call;
- The preparation and organisation of the final evaluation of research projects funded in both CONCERT calls at the end of the funding period.

Description of Programmed Activities

Task 4.1 – Setting up a Joint Call Secretariat (JCS) (ANR)

Key activities during year 5 are:

- The JCSs have been established at ANR for the respective CONCERT calls in 2016 and 2017. After finalisation of the evaluation procedures, the JCS is responsible for the follow-up and monitoring of funded projects in both calls.

Task 4.2 - Preparation of the Open Call documents and launch of the call (ANR, SSM, FCT, MINECO)

Key activities during year 5 are:

- This task has been completed.

Task 4.3: Implementation of the open call (ANR, SSM, FCT, MINECO)

Key activities during year 5 are:

- This task has been completed.

Task 4.4: Monitoring of the calls and the funded projects (ANR, SSM, FCT, MINECO)

Key activities during year 5 are:

- Follow-up and monitoring of the nine projects funded in the two CONCERT calls (three projects in call 1 and six projects in call 2).
- Preparation and organisation of the final evaluation of research projects funded in both CONCERT calls at the end of the funding period in March 2020.

Deliverables

D4.3 Analysis on the assessment of final reports of CONCERT funded projects under CONCERT open RTD Call 1 (M60)

D4.6 Analysis on the assessment of final reports of CONCERT funded projects under CONCERT open RTD Call 2 (M60)

1.1.11.5 WP5 Stakeholder involvement and communication in radiation protection research

Set of Activities Number	5	**Start Date or Starting Event**			M49
Set of Activities Title	Stakeholder involvement and communication in radiation protection research				

Participant Number	**5**	1	12	2	21	3	29	31	33	LTP
Short name of participant	**DH-PHE**	BfS	IRSN	STUK	ISS	SCK-CEN	VUJE	UL	UEF	NMBU/NRPA
Person-months per Participant:	13.2	0,1	1.5	0.05	1.0	1	0.5	0.1	0,37	0.5

Objectives

WP5 will promote stakeholder engagement activities and help develop information for the CONCERT website

The main objectives for the fifth project year are:

- To complete and disseminate results of the public facing survey, and consider further sampling
- To hold further stakeholder group meetings
- To refine the information on radiation exposure and risk on the CONCERT web pages

Description of Programmed Activities

Task 5.1 Strategy for public and societal stakeholder engagement (Lead: DH-PHE; Partners: ExB members, IRSN, ISS, VUJE; LTP: NMBU/NRPA)

Following the successful development of a stakeholder engagement strategy and its posting on the CONCERT website in December 2015, in the current year the strategy will be refined in the light of comments received.

Task 5.2 Establish a stakeholder group (Lead: IRSN; Partners: ExB members, IRSN, ISS, VUJE; LTP: NMBU/NRPA)

Key activities during year 5 are:

- To widen membership of the Stakeholder group
- Hold further CONCERT stakeholder meetings, , including web-conference meetings, as well as one face-to-face meeting

Task 5.3 Interaction with the civil society, including use of social media for stakeholder communication (Lead: ISS; Partners: ExB members, IRSN, ISS, VUJE; UL LTP: NMBU/NRPA)

Key activities during year 5 are:

- Analysis and dissemination of results of the responses to the public facing survey.
- In light of results of the analysis and the extent to which the respondents are representative of the population as a whole, investigate strategies to improve representation in the sampling if required, taking cost and time and other resource issues into account

Task 5.4 Development of general and specialist information for the CONCERT website (Lead: DH-PHE; Partners: ExB members, SCK.CEN, IRSN, ISS, VUJE; LTP: NMBU/NRPA)

Key activities during year 5 are:

- Continued identification and selection of existing web based information on radiation risk and developing appropriate content for the CONCERT website
- Publication of latest developments/achievements (news) to keep the stakeholders informed
- Promotion of upcoming events including but not limited to stakeholder meetings, workshops, courses

Deliverables

none

1.1.11.6 WP6 Access to infrastructures

Set of Activities number	6					**Start date**		M 49
Set of Activities title	Access to infrastructures							
	CONCERT Consortium Members							
Participant number	**6**	1	2	3	7	12	14	16
Participant short name	**CEA**	BfS	STUK	SCK-CEN	UniPv	IRSN	CIEMAT	MTA-EK
Person-months per participant	8	0.25	0.15	0.4	0.4	0.25	0.4	0.4
Participant number	17	18	21	22	23	28	32	33
Participant short name	NCRPP	HMGU	ISS	NRPA	RIVM	EEAE	UL	UEF
Person-months per participant	0.15	0.5	0.15	0.15	0.5	0.15	0.15	0,45
Participant number	34							
Participant short name	GIG		LTP NMBU/ NRPA	LTP SU/ MELODI	LTP GSI/ HMGU	LTP KIT/ HMGU	LTP CTU-FBME/ SURO	
Person-months per participant	0,07		0.5	0.15	0.15	0.15	0.15	

Objectives

WP6 aims to increase the visibility of infrastructures fulfilling recommended criteria and facilitate their access to the radiation protection research community.

The main objectives for the fifth project year are:

- To implement the portal “Access to Infrastructures for Radiation protection Research Documented Database” (AIR²D²) (continued),
- To publish regular information about infrastructures in the bulletin AIR² (continued),
- To propose harmonisation practices and protocols preferably exposures platforms, and possibly databases and biobanks (continued),
- To develop a strategy and a roadmap for facilitating access to infrastructures (continued).

Description of Programmed Activities

Task 6.1 Promote the visibility of research infrastructures (Lead: NMBU**;** Partners: IRSN, CIEMAT, CEA, BfS, STUK, SCK-CEN, UniPv, MTA-EK, NCRRP, HMGU, ISS, NRPA, RIVM, EEAE, UEF, UL, LTP**:** SU, GSI, KIT, CTU-FBME**)**

Key activities during year 5 are:

- Increase the number of infrastructures included in AIR²D² (all partners),
- Publication of the last issues of bulletin AIR² (the 40th will be the last in September 2019) and 2 or 3 dedicated special issues to increase visibility of particular infrastructures and the final outcomes of the CONCERT projects (lead: CEA),
- Present AIR²D² in each radiation protection-related event through posters or talks (all partners),

Task 6. 2 Harmonise Practices and Protocols (Lead: RIVM; Partners: BfS, MTA-EK, SCK-CEN, CEA, CIEMAT all WP6 partners**)**
Key activities during year 5 are:

- Actions for facilitating use of open infrastructures (including intercomparison exercises) by researchers (lead: MTA-EK),
- Actions on incrementing the STORE database (lead: BfS)

Task 6.3 Strategy for Facilitating Access to infrastructure (Lead: CEA; Partners: all WP6 partners**)**
Key activities during year 5 are:

- Actions to build a roadmap including funding possibilities for some pilot open infrastructures (lead: CEA),
- Actions with WP7 for organise visit and/or courses on some infrastructures associated to E&T activities (lead: UniPv).

Deliverable

D6.6 Publishing the web-Handbook including protocols issued from harmonization procedures (M60)

1.1.11.7 WP7 Education and training

Set of Activity number	7						**Start Date**	**M 49**
Set of Activity Title	**Education and Training**							
Participant Number	**7**	1	3	6	14	15	16	17
Short Name of Participant	**UniPv**	BfS	SCK•CEN	CEA	CIEMAT	NRIRR	MTA-EK	NCRRP
Person-months per Participant	8	0.4	1	0.2	0.2	1	0.2	0.2
Participant Number	18	19	20	25	28	29	30	33
Short Name of Participant	HMGU	MUW	ENEA	IMROH	EEAE	VUJE	UT	UEF
Person-months per Participant	1	0.2	0.24	0.2	0.2	0.2	0.2	0,49
Participant Number	LTP	LTP	LTP	LTP	LTP	LTP		
Short Name of Participant	IST/EURADOS	ENSTTI/IRSN	ISGlobal/CIEMAT	NMBU/NRPA	SU/MELODI	Jülich/HMGU		
Person-months per Participant	0.2	0.2	0.2	0.2	1	0,2		

Objectives

WP7 aims to maintain an Education and Training (E&T) programme as an integral part into CONCERTs research programme activities.

The main objectives for the fifth project year are:

- Providing support for students and young post-doctoral researchers to European E&T by offering grants for training and travel
- Promoting E&T as an intrinsic part of knowledge management and dissemination of new science, through the provision of training courses, workshops and seminars within the CONCERT research programme.
- Organisation and sponsorship of targeted initiatives in order to promote the specialised skills and knowledge needed to maintain the full competence of the research community and to disseminate research results and stimulate exchanges; organising a second call for E&T short courses.
- Coordination and collaboration with all research platforms and the wider industry and regulatory interests in order to take advantage of common policies, resources, and funding streams.
- Encouraging the integration of junior scientists into the European radiation risk research community

Description of Programmed Activities

Task 7.1 – Attracting and retaining students and junior scientists into the Radiation Protection research fields (Task leader: SU, Task participants: UniPv, HMGU, NMBU, NRIRR, MTA-EK, SCK•CEN, MUW, IST, UT**)**

Key activities during year 5 are:

- The rolling call for travel grant applications will continue, and be actively promoted.

Task 7.2: Education and training as an essential part of dissemination and knowledge management within CONCERT (Task leader: NRIRR, Task participants: SCK•CEN, UniPv, NCRRP, SU, MUW, VUJE, CEA, MTA-EK, NMBU, CREAL, STUK**)**

Key activities during year 5 are:

- The projects funded through the second of the CONCERT calls will be monitored and the incorporation of E&T will be assessed, leading to Deliverable D7.8. Collaboration between project E&T initiatives and existing CONCERT E&T activities will be encouraged.

Task 7.3: Targeted E&T initiatives (Task leader: UniPv, Task participants: NRIRR, NCRRP, HMGU, SU, CEA, MUW, MTA-EK, SCK•CEN, NMBU, CREAL, STUK**)**

Key activities during year 5 are:

- The fifth open call will have been made in April 2019, in collaboration with Task 1.6, for institutions to organise short courses (up to 3 weeks length), summer schools, or teaching seminars on topics of relevance to the CONCERT research programme. These courses will be held between September 2019 and May 2020. In the period covered by the AWP the successful courses will be scheduled and advertised. Feedback will be collected from the courses.

Task 7.4: Coordination and collaboration on E&T policy and strategy (Task leader: SCK•CEN, Task participants: BfS, HMGU, UniPv, NRIRR, VUJE, CEA, MTA-EK, ENEA, EEAE, ENSTII, UT, IST, NMBU, CREAL, STUK, IMROH, EURADOS**)**

Key activities during year 5 are:

- The annual E&T Forum will be hosted by CONCERT to be held in conjunction with the European Radiation Protection Week 2019 to be held in Stockholm 14-18 October 2019, in order to bring together all groups with interests in E&T for radiation protection and related topics, and to showcase the work being done by CONCERT.
  Updated information on E&T will be presented on the CONCERT webpage.

Task 7.5: European integration of junior scientist career development (Task leader: HMGU, Participants: UniPv, NRIRR, CIEMAT, IST, VUJE, CEA, MUW, MTA-EK, UT, NCRRP, IMROH, NMBU**)**

Key activities during year 5 are:

- Promote the ERPW 2019 for young scientists.

Deliverables	
D7.5	5th Annual report on awards and grants given (M60)
D7.16	Final report on the coordination and collaboration on E&T policy and strategy in radiation protection related themes

1.1.11.8 WP8 Ethics

This work package sets out the 'ethics requirements' that the project must comply with. If there are any changes of the 'ethics requirements' that the project must comply with included as deliverables in this work package the corresponding deliverable will be updated by the CONCERT coordinator as WP leader accordingly.

1.1.11.9 WP9 Research projects selected through CONCERT open calls

Set of Activity number	9	**Start Date**	**M49**
Set of Activity Title	**Research projects selected through CONCERT open calls**		

Objectives

The objective of WP9 is to bring together RTD activities selected through two calls for research projects organised along the CONCERT project. As a result of the first Transnational call for proposals on "Radiation Protection Research in Europe" through the EJP CONCERT, launched in June 2016, three projects forming the three first tasks of the WP9 have been granted: As a result of the second Transnational call for proposals on "Radiation Protection Research in Europe" through the EJP CONCERT, launched in March 2017, six projects forming six new tasks (Task 9.4-Task 9.9) of the WP9 have been granted:

CONFIDENCE (Task 9.1) aims to close existing gaps in several areas, concentrating on the early and transition phases of an emergency but also dealing with longer-term decisions made during these phases. It brings together expertise from all four Radiation Protection Platforms and also from Social Sciences and Humanities, such that it can address the scientific challenges associated with model uncertainties and improve radioecological predictions and emergency management (NERIS and ALLIANCE), situation awareness and monitoring strategies (EURADOS), risk estimation in the early phase (MELODI), decision making and strategy development at local and national levels (NERIS) including social and ethical aspects (Social Sciences and Humanities). CONFIDENCE work-programme is to understand, reduce and cope with the uncertainty of meteorological and radiological data and their further propagation in decision support systems including atmospheric dispersion, dose estimation, food chain modelling and countermeasure simulations. Consideration of social, ethical and communication aspects will be a key part of the activities. Improvements in modelling and combining simulation with monitoring to obtain a comprehensive picture of the radiological situation will clearly improve decision making under uncertainties. Decision making principles and methods will be investigated, ranging from formal decision aiding techniques to simulation based approaches. These will be demonstrated and tested in stakeholder workshops applying the simulation tools developed within CONFIDENCE.

LDLensRad (Task 9.2) aims to bring together experts from across Europe to answer a number of key research questions on this topic, including: how does low dose radiation cause cataracts; is there a dose rate effect, and how does genetic background influence cataract development after radiation exposure. The research will also address the issue of ageing in a sensitive subset of mice and whether lens effects can be viewed as global biomarkers of radiosensitivity. The collaborators will work with mouse models supported by cellular studies to investigate the mechanistic chain of events from the initial radiation insult and biological responses through to formation of lens opacities. The biological investigations will be supported by rigorous statistical modelling for hypothesis development. In addition, the partners will explore the potential for a prospective molecular epidemiology programme using human lenses taken from the former Mayak PA workers. The results of this project will be highly relevant for CONCERT low dose radiation research and radiation protection and the work plan is particularly in line with the MELODI and EURADOS strategic research agendas with additional key implications for medical radiation protection. Concrete outcomes are anticipated to include: definitive information regarding the shape of the dose response curve and thus the risk of radiation cataract at doses < 500 mGy, advancing the debate as to the nature of radiation cataracts as either deterministic tissue reactions or stochastic effects and thus strengthening the evidence base for informed radiation protection; the assessment of lens effects as biomarkers of global radiosensitivity to provide potential new tools for health risk assessment as well as the education and training of a number of early career scientists in low dose radiation research.

TERRITORIES (Task 9.3) targets an integrated and graded management of contaminated territories characterised by long-lasting environmental radioactivity, filling in the needs emerged after the recent post-Fukushima experience and the publication of International and European Basic Safety Standards. A graded approach, for assessing doses to humans and wildlife and managing long-lasting exposure situations (where radiation protection is mainly managed as existing situations), will be achieved through reducing uncertainties to a level that can be considered fit-for-purpose. The integration will be attained by:

- Bridging dose and risk assessments and management of exposure situations involving artificial radionuclides (post-accident) and natural radionuclides (NORM),
- Bridging between environmental, humans and wildlife populations monitoring and modelling, Bridging between radiological protection for the members of the public and for wildlife,
- Bridging between experts, decision makers, and the public, while fostering a decision-making process involving all stakeholders.

This project will interlink research in sciences supporting radiation protection (such as radioecology, human or ecological dose and risk assessments, social sciences and humanities, etc.), providing methodological guidance, supported by relevant case studies. The overall outcome will be an umbrella framework, that will constitute the basis to produce novel guidance documents for dose assessment, risk management, and remediation of NORM and radioactively contaminated sites as the consequence of an accident, with due consideration of uncertainties and stakeholder involvement in the decision making process. The results will be widely disseminated to the different stakeholders and accompanied by an education and training programme.

ENGAGE (Task 9.4) aims to improve the governance of radiological risks by strengthening and enhancing stakeholder engagement processes in relation to radiation protection policy and practice. The proposal will identify and address key challenges and opportunities for stakeholder engagement in relation to different ionising radiation exposure situations. It focuses on exposure situations corresponding to major (actual or potential) components of radiation exposures for the general population: i) medical use of ionising radiation, ii) emergency and recovery planning and response; and iii) indoor radon. These situations differ in terms of perception, acceptance and justification of exposure to radiological risk: voluntary vs. involuntary risk, existing vs. planned exposure, medical vs. nuclear energy related risk, natural vs. artificial sources of radioactivity. Moreover the stakeholders involved and the frameworks for engagement are also specific. For these reasons, the project addresses these three types of exposure situations in different subtasks

throughout the project, and foresees joint reflections in each of the work packages allowing comparative assessments and the formulation and sharing of additional lessons learned with regard to meaningful differences and similarities of stakeholder engagement approaches. The innovative aspects of ENGAGE are twofold, relating to both the research needs it addresses and the research methodology employed.

To address the research needs ENGAGE will:

a) answer the questions why, when and how are stakeholders engaged in RP issues, by i) analysing the rationales for stakeholder engagement; ii) clarifying the influencing factors (legal, political, economic, cultural, social, ethical), and iii) examining the participatory models and tools employed (ST 9.4.1);
b) develop novel approaches to analysing stakeholder interaction and engagement and, provide guidance for meeting challenges and opportunities identified in response to (a) (ST 9.4.2);
c) investigate the processes for enhancing RP culture and their role in facilitating stakeholder engagement in RP, and develop guidelines for building RP culture (ST 9.4.3);
d) develop guidelines and build a joint knowledge base for stakeholder engagement in RP (ST 9.4.1, -ST 9.4.4).

ENGAGE will draw on state of the art research methods in social sciences and humanities.

LEU-TRACK (Task 9.5) proposes to study basic mechanisms in low dose radiation-induced leukaemia by focusing on two highly innovative aspects in the mechanism of the disease: the role of signalling between the bone marrow microenvironment and the stem cell compartment in initiating the leukemic process and the role of extracellular vesicles (EVs) in mediating radiation-related signals among the different cellular compartments of the haematopoietic system. While radiation-induced direct damage to the haematopoietic stem cell pool is suggested to be the major driver in the development of the disease after higher doses, radiation-induced leukaemia at low doses most probably involves additional mechanisms distinct from those at high doses. EVs are major vehicles of intercellular communication due to their complex cargo. Recent data have shown that EVs mediate radiation-induced bystander effects in the bone marrow, initiating signals that lead to bone marrow dysfunction. The proposal aims to investigate mechanisms and pathways how bone marrow-derived EVs, by influencing the communication between the different cellular components of the bone marrow can induce bone marrow damage and thus modulate low dose radiation-induced leukaemia. A further objective of the proposal is to perform a deep and systematic analysis of EV cargo by using multiple omics techniques and complex phenotypical approaches with the aim to identify biomarkers of radiation exposure potentially indicating an increased risk for leukaemia development. In order to correlate blood-derived EV markers identified in experimental animals with markers present in human leukaemia patients, a small pilot study, analysing blood-derived EV cargo from leukaemia patients subjected to prophylactic brain irradiation will also be carried out. In this way, the project will provide a better understanding of pathways and/or mechanisms of low dose radiation carcinogenesis and will contribute to a better evaluation of the risks associated with low doses, helping to improve risk perception, disease prevention, health promotion and in the later run therapy development.

PODIUM (Task 9.6) has the objective to improve occupational dosimetry by an innovative approach: the development of an online dosimetry application based on computer simulations without the use of physical dosemeters. Operational quantities, protection quantities and radiosensitive organ doses (e.g. eye lens, brain, heart, extremities) will be assessed based on the use of modern technology such as personal tracking devices, flexible individualised phantoms and scanning of geometry set-up. When combined with fast simulation codes, the aim is to perform personal dosimetry in real-time. A further objective is to develop an online application in which we will calculate individually the occupational doses, instead of measuring them with one or more dosemeters. For that purpose, the spatio-temporal radiation field, including its energy and angular distribution, needs to be known. We will use input from fixed dose monitors and we will capture real movements of exposed workers and transfer this to the calculation application.

SEPARATE (Task 9.7): Brain and skin cancer development is increased by an exposure of distant tissues in genetically sensitive mice, indicating that there is a level of communication between irradiated and non-irradiated tissues and organs. Changes in the levels of non-coding RNA molecules released from irradiated tissues in patients undergoing radiation therapy limited to the head. The nature of the molecule(s) and pathways responsible for this signalling is unknown, although numerous candidates have been proposed, ranging from calcium, NO, RNA, cytokines and growth factors. Understanding how the signal(s) are transmitted to non-irradiated cells/tissues and how it/they provoke a systemic response is crucial, but far from being complete. SEPARATE will extend these studies to the analysis of the effects on brain, heart, and liver, following exposures of the lower third of the body, whilst the target organs are shielded. Changes in these important organs at the transcriptome, non-coding RNAs, protein, and metabolic levels will be examined. Where possible, partial-organ irradiation will be carried out, and it will be looked at molecular and cellular damage in non-irradiated organ portions. Exosomes from exposed tissues and their specific bioactive cargo - particularly RNA content – for their role in mediating out-of-target effects in vitro and in vivo will also be investigated. By combining this cellular, molecular and bioinformatics data it will be able to identify the response pathways in the different tissues, and by inference, suggest the candidate signalling molecules involved. A second major outcome of this project will be the discovery of candidate biomarker molecules of both whole body and partial body irradiation responses.

SHAMISEN-SINGS (Task 9.8) built upon the recommendations of the EC-OPERRA funded SHAMISEN project, aims to enhance Cit n Participation in preparedness for and recovery from a radiation accident through novel tools
and APPs to support data collection on radiation measurements, health and well-being indicators. SHAMISEN-SINGS brings together an experienced multi-disciplinary and multi-national consortium to answer important objectives of the call: to improve countermeasures for nuclear emergency preparedness and provide important knowledge on stakeholder engagement in radiation protection, including a critical assessment of benefits and challenges of citizen science. By taking a practical ethics approach, fostering co-reflection between natural and social scientists, it will strengthen integration of social science in radiation protection. It will also provide an independent channel for collection and management of data for use by authorities for decision making, assessment of doses, evaluation of health/social condition and health surveillance in general, and support in the implementation of BSS.

VERIDIC (Task 9.9) focuses on the harmonisation of RDSR (Radiation Dose Structured Report) and on the validation of SDC (skin dose calculation) software products in IC, which will optimise radiation protection of patients.

Firstly, standards for digital dose reporting will be proposed including:

1) A complete list of parameters necessary to calculate MSD (maximum skin dose) and 2D dose distribution (tubevoltage, filtration, beam orientation, table position, backscatter factor, table attenuation, air KERMA-to-skin doseconversion coefficient, etc.);
2) The recording (format and content) of MSD values and 2D dose distributions in the RDSR.

Secondly, protocols for acceptance testing and QC (quality control) of SDC software will be developed and tested, including:

1) comprehensive calibration of field dosimeters to be used for software benchmarking, including estimation of associated uncertainty;
2) acceptance testing of online and offline software in simple irradiation conditions;
3) QC tests of the software in clinical settings reproducing complex cardiac procedures such as Chronic Total Occlusions (CTO).

Thirdly, interventional Reference Levels (RL) and frequency of high-dose procedures as well as dose reduction strategies will be established thanks to a multi-centric data collection.
The project is supported by the European Federation of Organisations for Medical Physics (EFOMP) and collaboration with the European Society of Cardiology (ESC) will be sought, which ensures an optimal dissemination of results.

Description of Programmed Activities

The first 3 call winning projects started implementation in January 2017 (M20) by putting the project plans as submitted with their proposals into action. The six call winning projects of the 2nd call started between October 2017 and February 2018. The respective project coordinator will coordinate and direct project resources to meet the objectives of the project plan and will monitor all activities necessary to produce the deliverables.

Deliverables

Deliverables of WP9 cover the time June 2019 (M49) until end of CONCERT project (M60)

Task 9.1 (CONFIDENCE)

D9.23 Prioritisation of preferences. Transnational stakeholder surveys results M49
D9.30 Stakeholders' preferences and criteria for uncertainty management M49
D9.7 Report on uncertainty reduction in external exposure assessment based on environmental monitoring data, including concept for identifying critically exposed groups M51
D9.10 Paper on external dosimetry using personal objects M53
D9.12 Report on the risk assessment tool M53
D9.15 An evaluation of process based models and their application in food chain assessments M53
D9.16 Evaluation of the importance of hot particles in radioecological models M53
D9.29 Guidelines on tools for communication of uncertainties M53
D9.31 Report on international experts' dialogues M53
D9.5 Guidelines for the use of ensemble calculations in an operational context, indicators to assess the quality of uncertainty modelling and ensemble calculations, and tools for ensemble calculation for use in emergency response M53
D9.6 Software tool which allows the propagation of uncertainties to dose assessment models (in collaboration with Subtask 9.1.3) M53
D9.24 Guidelines and recommendations for decision making during the transition phase M54
D9.32 Recommendations for improved communication and stakeholder involvement related to uncertainties M54
D9.36 Report from stakeholder panels and workshops related to the application of the methods and tools developed in ST 9.1.6 M54
D9.37 Visualisation approaches developed and tested in workshops and panels M54
D9.17 CONFIDENCE: Overview of model improvements and future needs M55
D9.39 Operating the CONFIDENCE project for 36 months M55

Task 9.2 (LDLensRad)

D9.41	Mouse stress, communication studies	M49
D9.42	Mouse DNA damage studies	M49
D9.43	Mouse proliferation/morphology studies	M49
D9.44	Mouse molecular studies	M49
D9.45	In vitro stress, communication studies	M49
D9.46	In vitro DNA damage studies	M49
D9.47	In vitro proteomic, biochemical studies	M49
D9.48	Histopathological analyses	M52
D9.49	Behavioural analyses	M52
D9.50	Creation of statistical model	M55
D9.54	Progress summary and actions-3rd year	M55
D9.57	Year 3 advisory panel report	M55
D9.58	Collate D107-D117 and ready for submission	M55

Task 9.3 (TERRITORIES)

D9.60	Guidance to reduce sampling uncertainty	(M44, postponed M50)
D9.61	Guidance to select level of complexity	(M50)
D9.62	Methodology to quantify improvement	(M47)
D9.63	Guidance about exposure scenario	(M49)
D9.64	Social and ethical aspects	(M49)
D9.66	Stakeholders panels results/France	(M49)
D9.67	Stakeholders panels results/Spain	(M49)
D9.68	Stakeholders panels results/Belgium	(M49)
D9.69	Critical evaluation/remediation pathways	(M49)
D9.70	Framework for socio-economic analysis	(M49)
D9.71	Guidance for management/post-accident	(M55)
D9.72	Guidance for management/NORM	(M55)
D9.76	After each training_3rd year	(M54)

Task 9.4 ENGAGE

D9.86	Report on stakeholder engagement in radiation protection: transversal issues and specifics of different exposure situations	M50
D9.87	Final report on case studies, including recommendations and guidelines on building and enhancing radiation protection culture	M50
D9.88	Dissemination workshop	M51
D9.89	Report on venues, challenges, opportunities and recommendations for stakeholder engagement in the medical field	M52
D9.90	Report on venues, challenges, opportunities and recommendations for stakeholder engagement in emergency and recovery preparedness and response	M52
D9.91	Report on venues, challenges, opportunities and recommendations for stakeholder engagement in relation to indoor radon exposure	M52
D9.92	Knowledge base report	M54
D9.93	Operation of the ENGAGE project	M54
D9.94	Final report of the ENGAGE project	M54

Task 9.5 LEU-TRACK

D9.96 Evaluating leukaemia risk in irradiated +/- EV-treated animals M50
D9.97 Evaluating major cellular and molecular mechanisms mediated by irradiated EVs M54
D9.98 Identification of human EV-related leukaemia markers and radiation exposure markers M54
D9.99 Final report of the LEU_TRACK project M56
D9.100 Report on LEU-TRACK related dissemination and training activities M56

Task 9.6 PODIUM

D9.111 Report summarizing the feasibility of the methods, and the accuracy of personal dosimetry in the real workplace M49
D9.112 Document with the criteria for the approval of online dosimetry as legal dosimetry system M49
D9.113 Report from the feasibility study performed in two hospitals M53
D9.114 Report summarizing the experimental and clinical findings when using the online dosimetry application M54
D9.115 Workshop for the dissemination of the results and the application of the ALARA M54
D9.116 Fluence to dose conversion coefficients for reference phantoms and postures other than standing for photons and neutrons M55
D9.117 Fluence to dose conversion coefficients for non-reference phantoms for photons and neutrons M55
D9.118 User-friendly online application + manual and source code M55
D9.119 Report summarizing the computational developments needed to realise full online dosimetry using simulation of voxel phantoms in the workplace. M55
D9.120 Exploitation Plan 55
D9.121 Final report of the PODIUM project M55

Task 9.7 SEPARATE

D9.126 Data set on proteomic and metabolomic changes in control, irradiated and shielded tissues M52
D9.127 Data set on NGS-based miRNomes analysis in control, irradiated and shielded tissues M52
D9.128 Report on the status of publications and manuscripts M54
D9.129 Final report of the SEPARATE project M56

Task 9.8 SHAMISEN-SINGS

D9.136 Guidelines/concept for dose measurement apps and tools M52
D9.137 Preparation of core protocol for an APP to collect information on health and welfare M52
D9.138 Concept/guidelines for apps & tools for dose measurement & health and well-being monitoring M52
D9.139 Tutorials for apps and tools, including database management plan M52
D9.140 If feasible, Prototype APP for health and welfare monitoring, diet, space-time distribution M52

Task 9.9 VERIDIC

D9.142 Dosimeter calibration and measurement uncertainties in IC M56
D9.143 Acceptance and Quality control protocol; accuracy of the tested SDC software tools M56
D9.144 Collected procedures and recommendation for dose optimisation M56

Participation in Annual Work Plan activities

Most of the CONCERT consortium partners do not plan to involve Linked Third Parties (LTP) or external experts at the initial stage of the CONCERT-EJP project.

Although, potential LTPs are not included in the initial consortium, there will be a chance for inclusion after the first or second call, in case this organisation is member of a successful consortium, pending on an amendment to the grant agreement.

Partner 1: BfS, Germany:

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
The STORE website has become an important tool for archiving and data sharing within the radiation protection research community in Europe and worldwide. While it was initially planned for purposes in the research field of MELODI only, it now is of interest also for ALLIANCE. The same accounts to some extent for EURADOS and NERIS, in particular with respect to biological dosimetry. *The STORE website is hosted by BfS at no costs to the CONCERT project; and scientific curation of STORE will be done by BfS staff. Yet, a constant improvement of the website and of the software behind the website is crucial. This applies to both the database that is fundamental for STORE and the user interface. To maintain and constantly improve the STORE website, to adopt it to the rapid development in international standards of data sharing, to establish links to other archiving and data sharing platforms, and to update the nomenclature used for best possible description of the available information BfS needs support from a subcontractor.* *This subcontractor will be the University of Cambridge, UK (UCam). UCam set up the STORE platform within the previous STORE project, further developed it within the DoReMi project and prepared the migration from Cambridge to BfS. Further, UCam gave advice regarding data sharing politics and in setting up the nomenclature.*	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**N**
at a later stage	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Potential Linked Third Parties to BfS (To be included at a later stage):

BfS is not involving any Linked Third Parties in the beginning of the CONCERT project but foresees this possibility in the later stages of CONCERT, in Calls organised by CONCERT, or other H2020 projects.

In particular, the following universities have long-term cooperation links with BfS:

Ruprecht-Karls-University, Heidelberg:

Contact: Prof. Dr. Michael Hausmann (hausmann@kip.uni-heidelberg.de), Tel. 49 6221 54 9824
Address: Ruprecht-Karls-Universität Heidelberg, Hauptstr. 207 – 209, 69117 Heidelberg
Homepage: http://www.kip.uni-heidelberg.de/user/hausmann

Contact: Prof. Dr. rer. nat. Gerhard Glatting (gerhard.glatting@medma.uni-heidelberg.de, Tel: +49 621/383-4960 (Sekretariat)
Address: Universitätsmedizin Mannheim, Medizinische Fakultät Mannheim der Universität Heidelberg, Medizinische Strahlenphysik/Strahlenschutz, Theodor-Kutzer-Ufer 1-3, D-68167 Mannheim

Johannes Gutenberg University, Mainz, including university hospital:

Contact: Prof. Dr. M. Blettner (maria.blettner@unimedizin-mainz.de) Tel.: 06131 17-3252

Address: Universitätsmedizin der Johannes Gutenberg-Universität Mainz; Institut für Medizinische Biometrie, Epidemiologie und Informatik (IMBEI)
Obere Zahlbacher Str. 69; 55131 Mainz, Homepage: http://www.unimedizin-mainz.de

University Düsseldorf including University hospital

Contact: Dr. med. Arndt Borkhardt (lesch@med.uni-duesseldorf.de)
Tel. 49 (0) 211 - 81-17680
Address: Universitätsklinikum Düsseldorf, Moorenstr. 5, 40225 Düsseldorf
Homepage: www.uniklinik-duesseldorf.de/kinderonkologie
Homepage: http://epi.klinikum.uni-muenster.de/

Universität des Saarlandes:

Contact: Prof. Dr. Claudia Rübe (claudia.ruebe @uniklinikum-saarland.de)
Tel.: 06841/16-34614
Address: Universitätsklinikum des Saarlandes, Kirrberger Straße, Gebäude 51, D-66421 Homburg/Saar
Homepage: http://www.uniklinikum-saarland.de/de/

Uni Hannover: Institute for Radioecology and Radiation Protection

Contact: Prof. Dr. Clemens Walther, walther@irs.uni-hannover.de
Address: Herrenhäuser Str. 2, 30419 Hannover, Tel: +49 511 762 3312
Homepage: http://www.irs.uni-hannover.de/walther

Uni Bremen:

Contact: Dr. Helmut Fischer, hfischer@physik.uni-bremen.de) => SSK
Head, laboratory of environmental radioactivity and the group of terrestrial environmental physics at IUP Bremen, Universität Bremen, FB 1; Tel. 218-62761
Landesmessstelle für Radioaktivität
Address: Otto-Hahn-Allee, D-28359 Bremen
Homepage: www.radioaktivitaet.uni-bremen.de

Partner 2 STUK:

National Radiation Safety Research Programme

The Finnish Government Resolution on Comprehensive Reform of State Research Institutes and Research Funding took place in September 2013 (document in English). The main goal of the reform is to strengthen multidisciplinary, high-level research of social significance. One line of action was to deepen cooperation between research institutes and universities. To achieve this goal, the Resolution envisaged a step-by-step integration process leading to centers of competence (agreement-based consortiums). According to government policy, such agreement-based consortia must have common research equipment, laboratories and information resources (e.g. follow-up material, sample material, statistical and register material) as well as engage in close co-operation in research and education (e.g. sharing of mutually complementary competencies, joint professorships and duties, and shared staff). Furthermore, it was envisaged that, within the consortiums, the research institutes and universities form joint campus areas with common functions on a regional basis.

Based on the Government Resolution, a process was initiated in 2013 to strengthen the co-operation between STUK and universities and create a national research consortium that would carry out research on various aspects of ionizing and non-ionizing radiation safety. This process has involved an analysis of scientific disciplines required for radiation protection and surveying the profiles of Finnish universities. Existing collaborations were formalised and additional competencies were identified. By early 2015, the first version of a National Programme for Radiation Safety Research has been prepared in collaboration of STUK and nine universities (link to document). By the end of 2014, seven of these universities had already signed Expressions of Interest with STUK for the formation of a National Consortium for Radiation Safety Research. The formalization of the agreements between STUK and universities is expected to take place during 2015. In addition of STUK, the following universities have contributed to the national programme: Aalto University, Lappeenranta University of Technology, Tampere University of Technology, University of Helsinki, University of Eastern Finland, University of Jyväskylä, University of Oulu, University of Tampere and University of Turku. Research areas for the national programme include health (low dose risk as well as medical use of radiation), environment (radioecology) and emergencies (emergency preparedness and response, security of sources). As cross cutting themes risk assessment, risk management as well as technological development (metrology and dosimetry) are addressed. Overall, the programme is well aligned with the objectives of European radiation protection research platforms (MELODI, ALLIANCE, NERIS and EURADOS), with additional elements relevant for non-ionizing radiation safety, security research and metrology research. Introduction to the European Strategic Research Agendas (MELODI, ALLIANCE, NERIS, EURADOS, EMPIR and CBRN Action plan) was provided in a national stakeholder seminar organised by OPERRA in June 2014.
Based on the Government Resolution, the Agreement on National Consortium for Radiation Safety Research is expected to establish the necessary legal link for the beneficiary-Linked Third Party-relationship between the members of the Consortium.

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTP is research partners of STUK in its function as national radiation protection research programme manager. In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP has special expertise and competence for input in the CONCERT joint programming or integrative activities. Its contribution is expert input in the tasks and deliverables of WP2, WP3, and WP9.	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Party to STUK

University of Tampere (UTA)

Kalevantie 4, 33100 Tampere, Finland; Homepage: http://www2.uta.fi/en
Contact: Liisa Laakso, Rector of the University of Tampere; rehtori@uta.fi

Participant 3: SCK-CEN

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
SCK-CEN takes lead within the project CONFIDENCE regarding the Task 5.2 Socio-psychological study of understanding, processing and management of uncertainties and improved communication tools. Part of the upcoming survey research will be subcontracted.	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
Université de Liège is a Linked Third Party of SCK•CEN through the Belgian Convention for Radiation protection research ("Belgian Convention"). Université de Liège is an entity with a legal link to the Beneficiary (cf. article 14 of the MGA) through the accession to the Belgian Convention. The cooperation under the Belgian Convention is broad and not specifically created for the work in the GA. Université de Liège is involved in CONCERT WP9 – Task 9.4 – ENGAGE. And here more precisely in ST9.4.2 and ST9.4.4	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Party to SCK-CEN

Université de Liège (Liège university-ULg); Place du 20 Août, 7; 4000 Liege; Belgium
contact person is Prof. Dr. Catherine Fallon, Faculty of Law, Director of SPIRAL, Sart-Tilman B31, 4000 Liège, Belgium

Participant 4: ANR

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**N**
at a later stage	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Participant 5: DH-PHE

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
DH-PHE plans to subcontract the irradiation services to Medical Research Council (MRC), as an adjacent facility to PHE, as described in point 3.3 of the proposal for the participation in LDLensRAD.	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs are partners of the Department of Health - Public Health England (DH-PHE) *and give major expert input in their work.* *In WP9 of the integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. The LTPs have special expertise and competence for input in the CONCERT joint programming integrative activities. Its contribution is expert input in the tasks and deliverables of WP9.*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Linked Third Party to DH-PHE

Met Office Met Office UK; Met Office, Fitz Roy Road; Exeter; Devon EX1 3PB; United Kingdom
Contact: Science lead – Susan Leadbetter susan.leadbetter@metoffice.gov.uk
Oxford Brookes University Headington Campus, Headington Rd, Gipsy Ln, Oxford OX3 0BP, United Kingdom
Contact**:** mkadhim@brookes.ac.uk
University of Durham Durham University; Palatine Centre, Stockton Road, Durham, DH1 3LE
Contact: Sally Hewlett lear.admin@durham.ac.uk
University of Warwick University of Warwick, University House, Kirby Corner Road,
Coventry CV4 8UW
Contact: Dr Navdeep Bains, Head of Research Support

Partner 6: CEA

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
CEA plans to use subcontractors for the subtasks 6.1.3 Increase the visibility of recommended infrastructures and 6.3.2 Developing training "subcontractor will be called to prepare tools for increasing the visibility of the selected infrastructures (subtask 6.1.3) and to promote the training of the users (subtask 6.3.2) via leaflets, videotaping."	

Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**N**
at a later stage	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Partner 7: UniPV

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**N**
at a later stage	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Participant 8: MELODI

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTP is a partner of the research platform MELODI and give major expert input in the work of MELODI. In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTP. The LTP has special expertise and competence for input in the CONCERT joint programming or integrative activities. Its contribution is expert input in the tasks and deliverables of WP2, WP3, WP5, WP6 and WP7.	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**N**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Linked Third Party to MELODI

University Stockholm (**SU**), Universitetsvägen 10A, SE-10691 Stockholm, Schweden, Tel: +46 8 16 1217, contact: andrzej.wojcik@su.se , and mats.harms-ringdahl@su.se www.su.se/english/

Participant 9: ALLIANCE

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTP is a partner of the research platform ALLIANCE and give major expert input in the work of ALLIANCE. *In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTP. The LTP has special expertise and competence for input in the CONCERT joint programming or integrative activities. Its contribution is expert input in the tasks and deliverables of WP9.*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**N**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Linked Third Party to ALLIANCE

NERC Centre for Ecology & Hydrology (CEH) CEH Wallingford, Maclean Building, Benson Lane; Crowmarsh Gifford ; Wallingford Oxfordshire OX10 8BB

Contact: Mr Jack O'Brien (01491 692567); Mrs Liz Stansfield (01491 692324)

Email: cehresearchcontracts@ceh.ac.uk

External Experts to ALLIANCE:

Lorraine Currivan, EPA, (L.Currivan@epa.ie), Environmental Protection Agency (EPA), Office of Radiological Protection, 3 Clonskeagh Square, Clonskeagh Road, Dublin 14, Contact

Prof. Nick Beresford (nab@ceh.ac.uk), Natural Environment Research Council - Centre for Ecology & Hydrology (NERC-CEH), Lancaster Environment Centre, Library Avenue, Bailrigg, Lancaster LA1 4AP, Tel.: +44(0)1524 595800 Contact

Participant 10: NERIS

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs listed below are members of the research platform NERIS. They are key partners in the SRA working group of NERIS and give major expert input in the work of NERIS. In WP 2 and WP3 of the CONCERT joint programing and integrative activities input from the research platforms is required that cannot be covered by other NERIS members. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities on behalf of NERIS. Their contribution is expert input in the tasks and deliverables of WP2 and WP3.	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**N**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Linked Third Parties to NERIS

Technical University of Denmark (**DTU**), Center for Nuclear Technologies, Frederiksborgvej 399, Building 201, room S56, 4000 Roskilde, Denmark, Tel.: 45 46 77 53 19, Contact Person: Per Roos (roos@dtu.dk), http://www.dtu.dk/english

MUTADIS, 5 Rue d'Alsace, 75010 Paris, France, Tel.: 33 (0)1 48 01 88 77, contact: Gilles Hériard Dubreuil: g.heriard-dubreuil@mutadis.fr, http://www.mutadis.org

Università degli studi di Milano (**UNIMI**), Via Festa del Perdono 7, I-20122 Milano, Italy, Tel. ++39 02503 111, contact: Marie Claire Cantone: marie.claire.cantone@fisica.unimi.it, http://www.unimi.it/ENG/

Partner 11: EURADOS

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**

The LTPs are members of the research platform EURADOS. *They are key partners in the SRA working group of EURADOS and give major expert input in the work of EURADOS. In WP 2 and WP3 of the CONCERT joint programing and integrative activities input from the research platforms is required that cannot be covered by other EURADOS members. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities on behalf of EURADOS. Their contribution is expert input in the tasks and deliverables of WP2 and WP3.*

Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**N**
If yes, describe the procedure for selecting the third parties and the range of the envisaged financial support	

Linked Third Parties to EURADOS

Physikalisch-Technische Bundesanstalt (**PTB**), Bundesallee 100 D-38116 Braunschweig, Telefon: (05 31) 592-3006, Contact: PTB Helmut Schuhmacher helmut.schuhmacher@ptb.de/ Stefan Neumaier

Campus Tecnológico e Nuclear (**CTN**), Instituto Superior Técnico (IST), Pólo de Loures do IST, Estrada Nacional 10 (km 139,7), 2695-066 Bobadela LRS, Portugal, Contact: Pedro Vaz (pedrovaz@ctn.ist.utl.pt) / Joao Alves (jgalves@ctn.ist.utl.pt)

Institut Ruđer Bošković (RBI), Bijenička cesta 54, 10000 Zagreb, Croatia, contact: Saveta Miljanic (saveta@irb.cr) Zeljka Knesevic

Instytut Fizyki Jądrowej im. Henryka Niewodniczańskiego PAN (**IFJ PAN**), Krakow, Poland, contact: Pawel Olko (pawel.olko@ifj.edu.pl)

Seibersdorf Labor GmbH (**SL**)**,** Forschungszentrum, 2444 Seibersdorf, Austria, Tel:+43(0)50550-2500, contact: Hannes Stadtmann (hannes.stadtmann@seibersdorf-laboratories.at)

Partner 12: IRSN

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
IRSN will use the money to cover costs related to the services of an external consultant in charge of Task 2.6 ("Creating a SRA for social sciences and humanities in radiation protection").	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**

The LTPs are research partners of IRSN in its function as national radiation protection research programme manager. In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP2, WP3, WP5, WP6 and WP7.

Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	

Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to IRSN

Centre d'étude sur l'Evaluation de la Protection dans le domaine Nucléaire (**CEPN**), 28, rue de la Redoute, F-92260 FONTENAY AUX ROSES, Tel: +33 1 55 52 19 20, contact: **thierry.schneider@cepn.asso.fr** , http://www.cepn.asso.fr/en/

European Nuclear Safety Training und Tutoring Institute (**ENSTTI**), 12, rue de la Redoute, 92260 Fontenay-aux-Roses – Franc, Phone: +33 (0)1 58 35 72 32, Contact Person: Didier Louvat (didier.louvat@enstti.eu), http://www.enstti.eu/

External Experts to IRSN

Dietrich Averbeck, IRSN, France AND Kevin Prise, QUB, UK

Partner 14: CIEMAT

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
CIEMAT and FFII foundation in the Madrid Polytechnic University have been collaborating since 1986 (under several Contracts between both organizations) in the development of the different versions of the CROM code ("Código de cRiba para la evaluaciÓn de iMpacto" versions CROM-6, CROM-7 and CROM-8), including the development of Open Platform CROM (OP-CROM). Therefore, the programmers of the FFII foundation in the Madrid Polytechnic University, know the technical specifications of CROM, and are the most qualified (not to say the unique group) to make the developments in OP-CROM needed for the TERRITORIES project, which include: - Improve the core of the OP-CROM application as well as expand its capabilities, mainly considering the interconnection with other processes. - Develop and expand graphic interfaces for OP-CROM that facilitate the use of the application by the end user, on the one hand for the old models implemented in the SRS 19, and on the other, for the use of the new models. - Development of new calculation modules, based on the revision of the SRS 19. The amount of the subcontract is EUR 70,000.	

Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTP ISGlobal is a research partner of CIEMAT in its function as national radiation protection research programme manager. UPC will participate in WP9 Task "PODIUM project". UPC participates in 5 of the 6 WPs of PODIUM. UPC coordinates WP1 which includes the development of an indoor position system and the definition of the geometry input and radiation field mapping for the on-line dosimetry application. It is also in charge to lead a feasibility study towards application and improvement of fast Monte Carlo codes for on-line dosimetry in interventional radiology (WP2). In addition, its participation is foreseen for the definition of the requirements of the software for the on-line dosimetry application (WP3) and in the assessment and validation of the on-line dosimetry application in hospitals (WP4). Finally together with the other partners UPC will actively contribute to the dissemination of the project results (WP6).	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties

ISGlobal, Institut de Salut Global de Barcelona - Campus MAR, Parc de Recerca Biomèdica de Barcelona (PRBB), Doctor Aiguader, 88, 08003 Barcelona, contact: Prof. Elisabeth Cardis, elisabeth.cardis@isglobal.org Tel. +34 932 147 312, www.isglobal.org

UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC); Jordi Girona Salgado 31; 08034 Barcelona, Spain

Partner 18: HMGU

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
The work in the subcontract is to develop a pilot version of the smartphone-based data processing unit (software) for direct assessments of the absorbed thyroid dose based on the post-emergency thyroid monitoring data in case of a severe nuclear accident. This work requires an in-depth knowledge in the biokinetics of the relevant radioactive iodine isotopes, including the ICRP reference biokinetic model for embryo and fetus, assessment of the uncertainty budget and the so-called Dose per Content Function. Dr. Berkovskyy -- the RPI Scientific Supervisor of the RPI subcontract -- is an author of the ICRP iodine biokinetic model for the assessment of exposure of embryo and fetus. He is an internationally recognised outstanding expert in internal dosimetry and active member of ICRP Committee 2 for many years. The RPI team is a developer of the concept "dose per content", which is the core of the methodology to be used in the data processing unit. The RPI is also an author of the ICRP Data Software and Electronic Annex of the new ICRP Series "Occupational Intakes of radionuclides" http://www.icrp.org/docs/Electronic%20Annex%20OIR%20Data%20Viewer%20ICRP%20134	

%20v2171017.zip . Mr. Ratia is Corresponding Member of the ICRP Task Group on internal dose coefficients. The RPI IDSS software is a key tool for the development and QA of the current ICRP dose coefficients and the RPI dose assessment software IMIE is being used by a number of institutions in various countries. Such very specialised and focused skills outside the consortium were only available at the RPI. The subcontract was awarded to VOL/A, §3, paragraph 5 l. The RPI is the only supplier who can fulfil the scientific demands (unique selling proposition). The amount of the subcontract with RPI is EUR 68,000.	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs are research partners of HMGU in its function as national radiation protection research programme manager. In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programming and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP2, WP3, WP5, WP6 and WP7.	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to HMGU

Karlsruher Institut für Technologie (KIT), Campus North, Building 433, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Tel.: +49-(0)721-608/25525, contact: angelika.bohnstedt@kit.edu

GSI Helmholtzzentrum für Schwerionenforschung (GSI), Planckstraße 1, 64291 Darmstadt, contact: Sylvia Ritter (S.Ritter@gsi.de)

Forschungszentrum Jülich GmbH, Department of Safety and Radiation Protection, D-52425 Juelich, Germany, contact: Dr R Kriehuber (r.kriehuber@fz-juelich.de), Tel: ++49 (0)2461 61-4054

Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Institute of Resource Ecology, , contact: Dr. Thuro Arnold (t.arnold@hzdr.de), Tel: ++49 351 260 2432, Prof. Thorsten Stumpf (t.stumpf@hzdr.de), Tel. ++49 351 260 3210

Potential Linked Third Parties to HMGU (To be included at a later stage):

German Aerospace Center, Aerospace Medicine (**DLR)**, Linder Höhe, 51147 Köln, Germany
Tel: ++49 2203 601 3137, contact: Dr. Günther Reitz (guenther.reitz@dlr.de)

Partner 22 NRPA

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
Subcontract University of Life and Environmental Sciences of Ukraine (NUBiP) and Jozef Stefan Institute, Slovenia	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTP is a research partner of NRPA in its function as national radiation protection research programme manager. In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTP. The LTP has special expertise and competence for input in the CONCERT joint programming or integrative activities. Its contribution is expert input in the tasks and deliverables of WP2, WP3, WP5, WP6 and WP7.	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to NRPA

Norwegian University of Life Sciences (NMBU), P.O. Box 5003, NO-1432 Ås, Norway, Tel.: +47 67 23 00 00, contact: deborah.oughton@nmbu.no , http://www.nmbu.no

Partner 23 RIVM

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**N**
at a later stage	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Potential Linked Third Parties to RIVM (To be included at a later stage):

RIVM is not involving any Linked Third Parties in the beginning of the CONCERT project but foresees this possibility in the later stages of CONCERT, in Calls organised by CONCERT, or other H2020 projects.

In particular, the following universities have long-term cooperation links with RIVM:

Erasmus MC, Rotterdam:
Mail address: Postbus 2040, 3000 CA Rotterdam

Leiden University Medical Center (LUMC), Leiden:

Correspondence address: P.O. Box 9600, 2300 RC Leiden, The Netherlands Street address: Einthovenweg 20, 2333 ZC Leiden; Tel. +31 71 526 91 11

Partner 26 Statni ustav radiacni ochrany (SURO) Czech Republic

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs are research partners of SURO in its function as national radiation protection research programme manager. *In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP2, WP3, WP5, WP6 and WP7.*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to SURO

Ústav jaderné fyziky AV ČR, v. v. i. - Nuclear Physics Institute of the Czech academy of science, Department of Radiation Dosimetry (UJF) Czech Republic, CZ-250 68, Rez; E-mail: ujf@ujf.cas.cz; Website: http://www.ujf.cas.cz
Contact. Dr. Marie Davidková, Ph.D. davidkova@ujf.cas.cz

NRI UJV-REZ a.s. Mr. Vladimir Fišer, UJV Rez, a. s., Hlavni 130 - Rez, 250 68 Husinec, Czech Republic, Tel: 420 2 6617 2000

Potential Linked Third Parties to SURO (To be included at a later stage):

JIHOCESKA UNIVERZITA V CESKYCH BUDEJOVICICH (JCU) Branišovská 1160/31a, 370 05 České Budějovice, Tschechische Republik; contact: Friedo Zoelzer zoelzer@zsf.jcu.cz

Partner 27: Institutul de Fizică Atomică (IFA, Romania)

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs are research partners of IFA in its function as national radiation protection research programme manager. *In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP2, WP3, WP5, WP6 and WP7.*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to IFA-MG:

Horia Hulubei National R&D Institute for Physics and Nuclear Engineering (**IFIN-HH**), Str. Reactorului no.30, P.O.BOX MG-6, Bucharest-Magurele, Romania, Tel.: +(4021) 404.23.00 Webpage: http://www.nipne.ro/ Contact person: Ana Stochioiu stoc@nipne.ro

Potential Linked Third Parties to IFA-MG (To be included at a later stage):

National R&D Institute for Laser, Plasma and Radiation Physics (**INFLPR**), Str. Atomistilor, Nr. 409, PO Box MG-36, 077125, Magurele, Bucharest, Romania, Tel.: +40-21-4574550. Webpage http://www.inflpr.ro/ Contact person: Cătălin Ticoș catalin.ticos@inflpr.ro

National R&D Institute for Materials Physics (**INCDFM**), Atomistilor Str., No. 105 bis PO Box MG 7, 077125, Magurele, Romania, Tel.: +40-(0)21-3690185. Webpage: http://www.infim.ro/ Contact person: Andrei Gălățanu gala@infim.ro

National R&D Institute for Isotopic and Molecular Technologies (**INCDTIM**), 67-103 Donat, PO 5 700, 400293 Cluj-Napoca, România, Tel.: +40 264 58 40 37. Webpage: http://www.itim-cj.ro/en/index.php; Contact person: Claudiu Filip claudiu.filip@itim-cj.ro

Grigore Antipa National Institute for Marine Research and Development (**ICDM-NIMRD**), Blvd Mamaia no. 300, Constanta 3, RO-900581, România, Tel.: +40 241 543288, +40 241 540870. Webpage: http://www.rmri.ro/Home/Home.html?lang=en; Contact person: Vasile Pătrașcu vpatrascu@alpha.rmri.ro

University of Bucharest, Faculty of Physics (**UNIBUC**), CP MG - 11, Bucuresti-Magurele, RO – 077125 Romania, Tel.: 4 021 457 4949 contact: secretariat@fizica.unibuc.ro, Web page: http://www.fizica.unibuc.ro/ Contact person: Ionel Lazanu ionel.lazanu@g.unibuc.ro

State Owned Company "Technologies for Nuclear Energy" (**RATEN**), with the two subsidiaries:

***Institute for Nuclear Research (RATEN-ICN* [Pitești])**, Campului Str., Nr. 1, POB 78, 115400 - Mioveni, Arges, Romania, Tel.: + 40 248 21.34.00, contact: office@nuclear.ro, office_adj@nuclear.ro, Web page: http://www.nuclear.ro/en/index.php, Contact person: Alexandru Toma alexandru.toma@nuclear.ro

Center of Technology and Engineering for Nuclear Projects *(RATEN-**CITON***), 409, Atomistilor Street, Magurele, Judet Ilfov, Romania, Tel.: 021-45 744 31 Contact Person: Adrian Rizea (rizeaa@router.citon.ro), contact: citon@router.citon.ro, Web page: http://www.citon.ro/english_index.html, Contact person: Gabriela Florescu <florescug@router.citon.ro>

Politehnica of Bucharest, Faculty of Applied Sciences (**UPB**), Splaiul Independentei nr. 313, sector 6, Bucuresti, Romania, Postal cod: RO-060042, Tel.: + 4021-402 98 72, contact: e_nedelcu@rectorat.pub.ro, Contact person: Ana Maria Popovici popovici@physics.pub.ro Web page: http://www.upb.ro/en/the-faculty-of-applied-sciences.html

Babeș-Bolyai University, Faculty of Physics (**UBB-FF**), 1 Mihail Kogălniceanu street, 400084 Cluj- Napoca, Tel: + 40 (264) 405300, contact: phys@phys.ubbcluj.ro, Contact person: Decebal-Radu <dr.ciurchea@academic.ro>Web page: http://phys.ubbcluj.ro/index_en.htm

Partner 28: Greek Atomic Energy Commission (EEAE)

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs are research partners of IFA in its function as national radiation protection research programme manager. *In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTP have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP2, WP3.*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to EEAE:

National Centre for Scientific Research "Demokritos" (NCSRD) Patr. Gregoriou E' & 27, Neapoleos str., PO Box 60037, Postal Code 153 41, Agia Paraskevi, Attica, Greece
Contact: Dr. Nikolaos Kanellopoulos, Chairman of the Board and Director of NCSRD;
E-mail president@central.demokritos.gr

National Technical Univerity of Athens (NTUA) ; Zografou Campus; 9, Iroon Polytechniou str; 15780 Zografou, Greece, Contact: Ioannis Paspaliaris, paspali@metal.ntua.gr

Partner 32 University of Latvia (UL)

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
If yes, describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTP is research partners of JSI in its function as national radiation protection research programme manager. In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTPs have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP2 and WP3.	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to UL:

Riga Technical University (RTU) Faculty of Machinery, Transport and Aeronautics Institute of Biomedical Engineering and Nanotechnologies; KALKU IELA 1, Riga LV-1658, Latvia, director Prof. Yuri Dekhtyar,
Contact Prof. Aldis Balodis /Aldis.Balodis@rtu.lv

Partner 37 INSTITUT JOZEF STEFAN (JSI)

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**Y**
The Slovenian POM (JSI) subcontracts EIVM able to carry out the envisaged CONCERT tasks in WP9.	

Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
The LTPs are research partners of JSI in its function as national radiation protection research programme manager. *In WP 2, WP 3, WP5, WP6, WP7 and WP9 of the CONCERT joint programing and integrative activities input is required that cannot be covered by the national PM in total. Additional expertise and competence is provided by the LTPs. If the input provided per LTP is less than 0.1 person-month it is not specified in detail and summarised in the amount given for the participant, in case of higher input it is given separately. The LTPs have special expertise and competence for input in the CONCERT joint programming or integrative activities. Their contribution is expert input in the tasks and deliverables of WP3 (FSS), and WP9 (REC).*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to JSI:

Univerza V Ljubljani (UL) - Department: Faculty of Social Sciences (FSS)

Kardeljeva ploščad 5; 1000 Ljubljana, Slovenia,
Contact: Prof. dr. Ivan Svetlik, Rector is.jl-inu.vdf@kiltevs.navi

Partner 40 Danish Emergency Management Agency (DEMA)

Does the participant plan to subcontract certain tasks (please note that core tasks of the programme should not be sub-contracted) (article 13 of MGA)	**N**
Does the participant envisage that part of its work is performed by linked third parties (article 14 of MGA)	**Y**
DEMA will contribute to maintain and update Strategic Research Agendas (SRA), defining priorities and road maps for joint programming in order to enhance radiation protection culture and emergency preparedness. Especially, we are able to introduce advanced use of decision support systems and dispersion models into the project through the use and development of the ARGOS system, which has been developed in a close collaboration with PDC-ARGOS and Danish Meteorological Institute (DMI). *To maintain and constantly improve ARGOS, to adopt it to the rapid development in international standards of data sharing, to establish links to other dispersion models, and to update the nomenclature used for best possible description of the available information DEMA needs support from Linked Third Parties.* *PDC-ARGOS together with DEMA has originally developed the ARGOS system to be used for CBRN(E) Emergency Preparedness and Response. ARGOS is a software system to support the emergency organization to make the best possible decisions in case of incidents involving atmospheric dispersion of hazardous CBRN-materials. In addition, PDC-ARGOS and DEMA have been mutually engaged in a number of international research and development projects i.a PDC-ARGOS is a supporting member of the NERIS-platform.* *The second Linked Third Party will be Danish Meteorological Institute (DMI, Denmark). DMI has been an operational partner of the Danish nuclear emergency preparedness for which the Danish Emergency Management Agency (DEMA) is responsible. In Particular DMI is constantly improving national meteorological services in the area of emergency preparedness for atmospheric dispersion of nuclear and*	

other harmful substances. DMI has taken part in numerous international research and development projects within radiation protection. *Both LTPs, PDC-ARGOS and Danish Meteorological Institute (DMI, Denmark) will contribute to CONCERT with their own resources.*	
Does the participant envisage the use of in-kind contribution provided by third parties (articles 11 and 12 of MGA)	**N**
If yes, describe the third party and their contributions	
Does the participant envisage the provision of financial support to third parties (article 15 of MGA)	**Y**
Please refer to 3.5 Financial support to third parties	

Linked Third Parties to DEMA:

Danish Meteorological Institute (DMI), Lyngbyvej 100, DK-2100 Copenhagen, T: +45 3915 7500 www.dmi.dk, **contact: Jens Havskov Sørensen,** Chief Consultant, MSc, PhD, R&D Department D: +45 3915 7432; M: +45 5093 3874; E: jhs@dmi.dk

PDC-ARGOS ApS.; H.J. Holst Vej 3-5C; 2605 Brøndby; http://www.pdc-argos.com/ ; **contact: Jan Pehrsson;** Managing Director; Phone: +45 3636 0022; Email: jp@pdc-argos.com

Remaining CONCERT consortium partners

4	ANR	The French National Research Agency	FR
6	CEA	Commissariat à l`Énergie Atomique	FR
7	UniPv	University Pavia	IT
8	MELODI	MELODI Research Platform	FR
13	SSM	STRALSAKERHETSMYNDIGHSETEN	S
15	NRIRR (OSSKI)	ORSZAGOS FREDERIC JOLIOT-CURIE SUGARBIOLOGIAI ES SUGAREGESZSEGUGYI KUTATO INTEZET	HU
16	MTA EK	MAGYAR TUDOMANYOS AKADEMIA ENERGIATUDOMANYI KUTATOKOZPONT	HU
17	NCRRP	NATIONAL CENTRE OF RADIOBIOLOGY AND RADIATION PROTECTION	BG
19	MUW	MEDIZINISCHE UNIVERSITAET WIEN	AT
20	ENEA	AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE	IT
21	ISS	ISTITUTO SUPERIORE DI SANITA	IT
24	FCT	FUNDACAO PARA A CIENCIA E A TECNOLOGIA	PT
25	IMROH	Institut za medicinska istrazivanja i medicinu rada	HR
29	VUJE	VUJE AS	SK
30	UT	TARTU ULIKOOL	EE
31	RSC	RADIACINES SAUGOS CENTRAS	LT
33	UEF	ITA-SUOMEN YLIOPISTO	FI
34	GIG	GLOWNY INSTYTUT GORNICTWA	PL
35	MINECO	MINISTERIO DE ECONOMIA Y COMPETITIVIDAD	ES
36	APA	Agencia Portuguesa do Ambiente, I.P.	PT
38	FOPH	EIDGENOESSISCHES DEPARTEMENT DES INNERN	CH
39	EPA	Environmental Protection Agency	IE
41	EURAMED	EUROPEAN ALLIANCE FOR MEDICAL RADIATION PROTECTION RESEARCH	AT

List of participants and their assignment to tasks

No	Participant Status	Participant organization name	Country	WP/ Task
1	Coordinator, WP 1 Leader and PM	Bundesamt für Strahlenschutz, BfS	Germany	WP 1/ Task 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1,9 WP 2/ Task 2.1, 2.2, 2.5, 2.7, WP 3/ Task 3.1; 3.2 WP 6/ Task 6.2.1 WP 7/ Task 7.4 WP 9/ Task 9.1/9.3/9.4
2	PM	STUK	Finland	WP 2/ Task 2.1, 2.2, 2.3, 2.5, 2.7 WP 3/Task 3.2 WP 5 WP 6 WP 7/ Task 7.2, 7.3, 7.4 WP 9/ Task 9.1/9.3
	LTP to STUK	*University of Tampere (UTA)*	*Finland*	*WP 2*
3	WP 3 Leader and PM	SCK-CEN	Belgium	WP 1/ Task 1.8 WP 2/ Task 2.2, 2.3, 2.4, 2.6 WP 3/ Task 3.2 WP 5 WP 6 WP 7/ Task 7.1, 7.2, 7.3, 7.4 WP 9/ Task 9.1/ 9.3/ 9.4/ 9.6/ 9.9
	LTP to SCK-CEN	*UNIVERSITE DE LIEGE (ULg)*	*Belgium*	*WP 9 / Task 9.4*
4	WP 4 Leader and PM	ANR	France	WP 1/ Task 1.5 WP 3/Task 3.2 WP 4/ Task 4.1, 4.2, 4.3, 4.4
5	WP 5 Leader and PM	DH (PHE)	UK	WP 1/ Task 1.8 WP 2/ Task 2.1, 2.3 WP 3/Task 3.2 WP 5/ Task 5.1, 5.4 WP 9/ Task 9.1/ 9.2/ 9.3/ 9.5/ 9.6
	LTP to PHE·	*DurhamUni*	*UK*	*WP 9/ Task 9.2*
	LTP to PHE	*· MetOffice*	*UK*	*WP 9/ Task 9.1*
	LTP to PHE	*· OBU*	*UK*	*WP 9/ Task 9.2/ 9.7*
	LTP to PHE	*· WarwickUni*	*UK*	*WP 9/ Task 9.3*
6	WP 6 Leader and PM	CEA	France	WP 2/ Task 2.2 WP 3/Task 3.2 WP 6/ Task 6.1.3, 6.2.4, 6.3 WP 7/ Task 7.2, 7.3, 7.4, 7.5 WP 9/ Task 9.9
7	WP 7 Leader and PM	UniPv	Italy	WP 2/ Task 2.5 WP 3/Task 3.2 WP 6 WP 7/ Task 7.1, 7.2, 7.3, 7.4, 7.5
8	Research Platform	MELODI	Europe	WP 2/ Task 2.1 WP 3/Task 3.2., 3.3 WP 5

8.1	*LTP to MELODI*	*Stockholm University (SU)*	*Sweden*	*WP 2* *WP 3/Task 3.2* *WP 6* *WP 7/ Task 7.1, 7.2, 7.3*
9	Research Platform	ALLIANCE	Europe	WP 2/ Task 2.2 WP 3/Task 3.2 WP 5
	LTP to ALLIANCE	CEH		WP 9/ Task 9.1
10	Research Platform	NERIS	Europe	WP 2/ Task 2.3 WP 3/Task 3.2 WP 5
	LTP to NERIS	*Università degli studi di Milano (UMIL)*	*Italy*	*WP 2/ Task 2.6* *WP 3/Task 3.2* *WP 9/ Task 9.1/ 9.4*
	LTP to NERIS	*Technical University of Denmark (DTU)*	*Denmark*	*WP 2/ Task 2.3* *WP 3/Task 3.2* *WP 9/ Task 9.1*
	LTP to NERIS	*MUTADIS*	*France*	*WP 2/ Task 2.6* *WP 3/Task 3.2* *WP 9/ Task 9.1/ 9.3*
11	Research Platform	EURADOS	Europe	WP 2/ Task 2.4 WP 3/Task 3.2 WP 5 WP 7
	LTP to EURADOS	*Physikalisch-Technische Bundesanstalt (PTB),*	*Germany*	*WP 2/ Task 2.4* *WP 3/Task 3.2*
	LTP to EURADOS	*Instituto Superior Técnico (IST)*	*Portugal*	*WP 7/ Task 7.1, 7.4, 7.5* *WP 3/Task 3.2* *WP 9/ Task 9.1*
	LTP to EURADOS	*Institut Ruđer Bošković (RBI)*	*Croatia*	*WP 3/Task 3.2* *WP 9/ Task 9.9*
	LTP to EURADOS	*Instytut Fizyki Jądrowej (IFJ PAN)*	*Poland*	*WP 2/ Task 2.4* *WP 3/Task 3.2*
	LTP to EURADOS	*Seibersdorf Laboratory (SL)*	*Austria*	*WP 2/ Task 2.4* *WP 3/Task 3.2*
12	PM	IRSN	France	WP 2/ Task 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7 WP 3/Task 3.2 WP 5/ Task 5.2 WP 6 WP 7 WP 9/ Task 9.1/ 9.3/ 9.4/ 9.8
	LTP to IRSN	*European Nuclear Safety Training und Tutoring Institute (ENSTTI)*	*France*	*WP 7/ Task 7.4* *WP 3/Task 3.2*
	LTP to IRSN	*Centre d'étude sur l'Evaluation de la Protection dans le domaine Nucléaire (CEPN)*	*France*	*WP 2/ Task 2.3, 2.6* *WP 3/Task 3.2* *WP 9/ Task 9.1/ 9.3/ 9.4/ 9.8*

13	PM	SSM	Sweden	WP 2 WP 3/Task 3.2 WP 4 WP 6 WP 7
14	PM	CIEMAT	Spain	WP 2/ Task 2.2, 2.3 WP 3/Task 3.2 WP 6 WP 7/ Task 7.5 *WP 9/ Task 9.1/ 9.3*
	LTP to CIEMAT	*Barcelona Institute for Global Health, ISGlobal*	*Spain*	*WP 2/ Task 2.1, 2.5* *WP 3/Task 3.2* *WP 7/ Task 7.2, 7.3, 7.4* *WP 9/ Task 9.4/ 9.8*
	LTP to CIEMAT	*UNIVERSITAT POLITECNICA DE CATALUNYA (UPC)*	*Spain*	*WP 9 /Task 9.6*
15	PM	NRIRR (OKI)	Hungary	WP 2/ Task 2.7 WP 3/Task 3.2 WP 7/ Task 7.1, 7.2, 7.3, 7.4, 7.5 WP 9/ Task 9.5
16	PM	MTA EK	Hungary	WP 2/ Task 2.1 WP 3/Task 3.2 WP 6 WP 7/ Task 7.1, 7.2, 7.3, 7.4, 7.5 WP 9/ Task 9.
17	PM	NCRRP	Bulgaria	WP 2 WP 3/Task 3.2 WP 6 WP 7/ Task 7.2, 7.3, 7.5
18	PM	HMGU	Germany	WP 2/ Task 2.1, 2.2, 2.4 WP 3/Task 3.2WP 6 WP 7/ Task 7.1, 7.3, 7.4, 7.5 WP 9/ Task 9.1/ 9.2/ 9.5/ 9.6/ 9.7
	LTP to HMGU	*GSI Helmholtzzentrum für Schwerionenforschung (GSI)*	*Germany*	*WP 6* *WP 3/Task 3.2*
	LTP to HMGU	*Forschungszentrum Jülich (Jülich)*	*Germany*	*WP 3/Task 3.2* *WP 7/Task 7.2*
	LTP to HMGU	*Helmholtz-Zentrum Dresden-Rossendorf (HZDR),*	*Germany*	*WP 2/ Task 2.2* *WP 3/Task 3.2*
	LTP to HMGU	*Karlsruher Institut für Technologie (KIT)*	*Germany*	*WP 2/ Task 2.3* *WP 3/Task 3.2* *WP 6* *WP 9/ Task 9.1*
19	PM	MUW	Austria	WP 2/ Task 2.5 WP 3/Task 3.2 WP 7
20	PM	ENEA	Italy	WP 2/ Task 2.1, 2.4 WP 3/Task 3.2 WP 7/ Task 7.4, WP 9/ Task 9.2/ 9.7

21	PM	ISS	Italy	WP 2/ Task 2.4, 2.5, 2.6, 2.7 WP 3/Task 3.2 WP 5/ Task 5.3 WP 6 WP 9/ Task 9.8
22	PM	NRPA	Norway	WP 2/ Task 2.3, 2.5, 2.6 WP 3/Task 3.2 WP 5 WP 6 WP 7 WP 9/ Task 9.1/ 9.3
	LTP to NRPA	*Norwegian University of Life Sciences (NMBU)*	*Norway*	*WP 2/ Task 2.6* *WP 3/Task 3.2* *WP 5* *WP 6/ Task 6.1* *WP 7/ Task 7.1, 7.2, 7.3, 7.4, 7.5* *WP 9/ Task 9.1/ 9.3/ 9.8*
23	PM	RIVM	Netherlands	WP 2/ Task 2.7 WP 3/Task 3.2 WP 6/ Task 6.2 WP 9/ Task 9.1
24	PM	FCT	Portugal	WP 1/ Task 1.7 WP 3/Task 3.2 WP 4
25	PM	IMROH	Croatia	WP 1/ Task 1.7 WP 2/ Task 2.6, 2.7 WP 3/Task 3.2 WP 7/ Task 7.4, 7.5
26	PM	SURO	Czech Republic	WP 2 WP 3/Task 3.2 WP 6
	LTP to SURO	*Czech Technical University in Prague (CTU)*	*Czech Republic*	*WP 2/ Task 2.1, 2.5* *WP 3/Task 3.2* *WP 6* *WP 3/Task 3.2*
	LTP to SURO	*NRI (UJV)*	*Czech Republic*	*WP 2/Task 2.7* *WP 3/Task 3.2*
27	PM	IFA_MG	Romania	WP 2 WP 3/Task 3.2 WP 7
	LTP to IFA	*Horia Hulubei National RTD Institute for Physics and Nuclear Engineering (IFIN-HH)*	*Romania*	*WP 3/Task 3.2* *WP 9/ Task 9.4*
28	PM	EEAE	Greece	WP 2/ Task 2.6 WP 3/Task 3.2 WP 6 WP 7/ Task 7.4 WP 9/ Task 9.1/ 9.4/ 9.6/.9.9
	LTP to EEAE	*NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS" (NCSRD)*	*Greece*	*WP 2/ Task 2.1, 2.3*

	LTP to EEAE	*NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA (NTUA)*	Greece	WP 2/ Task 2.1, 2.3
29	PM	VUJE	Slovak Republic	WP 1/ Task 1.7 WP 2/ Task 2.3, 2.6, 2.7 WP 3/Task 3.2 WP 5 WP 7/ Task 7.2, 7.4, 7.5 WP 9/ Task 9.1/ 9.4
30	POM	UT	Estonia	WP 1/ Task 1.7 WP 2/ Task 2.7 WP 3/Task 3.2 WP 7/ Task 7.1, 7.4, 7.5 WP 9/ Task 9.3
31	PM	RSC	Lithuania	WP 1/ Task 1.7 WP 2 WP 3/Task 3.2
32	POM	UL	Latvia	WP 2/T2.2 WP 5/ T5.3 WP 6/T 6.3
	LTP to UL	RIGAS TEHNISKA UNIVERSITATE (RTU)	Latvia	WP 2/T2.2 WP 3/Task 3.2
33	WP 2 Leader and PM	UEF	Finland	WP2 WP 3/Task 3.2 WP5 WP 6/ Task 6.2.1 WP 7/ Task 7.4
34	PM	GIG	Poland	WP2 WP 3/Task 3.2 WP6
35	POM	MINECO	Spain	WP4
36	POM	APA	Portugal	WP2 WP 3/Task 3.2 WP 9/ Task 9.1
37	PM	JSI	Slovenia	WP2 WP 3/Task 3.2 WP 9/ Task 9.4
	LTP to JSI	*UNIVERZA V LJUBLJANI (FSS-Uni-LJ)*	*Slovenia*	*WP 9/ Task 9.1*
38	POM	FOPH	Switzerland	WP2 WP 3/Task 3.2 WP 9/ Task 9.4
39	POM	EPA	Ireland	WP2 WP 3/Task 3.2
40	POM	DEMA	Denmark	WP 2 WP 3/Task 3.2
	LTP to DEMA	*DANMARKS METEOROLOGISKE INSTITUT (DMI)*	*Denmark*	WP 2 WP 3/Task 3.2
	LTP to DEMA	*PDC-ARGOS APS (PDC-ARGOS)*	*Denmark*	WP 2 WP 3/Task 3.2
41	Research Platform	EURAMED	Austria	WP 2/ Task 2.5 WP 3/Task 3.2 WP 5

1.1.12 List of programmed activities (table 2.3.b)

AWP Set of Activities

Activity No	Activity Title	Lead Participant No	Short name of lead participant	Person-Months Total for this activity	Start Month	End month
WP 1						
1.1	Overall legal, contractual, administrative management and financial management	1	BfS	30	49	60
1.2	Consortium, Executive and Management Board meetings	1	BfS	3,95	49	60
1.3	Updating the rolling annual work plan	1	BfS	3,95	49	60
1.4	External Scientific Advisory Board (ESAB) for the evaluation of CONCERT	1	BfS	3,95	49	60
1.5	Negotiation of projects to be funded through open RTD calls	1	BfS	4,55	49	60
1.6	Funding decision process for integration activities listed in the approved annual work programme	1	BfS	2,95	49	60
1.7	Attracting new members to the CONCERT EJP Consortium	27	IFA	3,10	49	60
1.8	Public CONCERT web page and a secure internal web-based work space	1	BfS	2,80	49	60
1.9	Establishment of an expert database for the reviewing processes of CONCERT	8	MELODI	1,45	49	60
			Total WP1	**56,68**		
WP 2						
2.1	Development of Strategic Research Agenda, roadmap and priorities for research on low dose risk	8	MELODI	7,57	49	60
2.2	Development of Strategic Research Agenda, roadmap and priorities for research on radioecology	9	ALLIANCE	6,67	49	60
2.3	Development of Strategic Research Agenda, roadmap and priorities for research on emergency preparedness and response	10	NERIS	7,08	49	60
2.4	Development of Strategic Research Agenda, roadmap and priorities for research on dosimetry	11	EURADOS	4,37	49	60
2.5	Development of Strategic Research Agenda, roadmap and priorities for research with the medical scientific community	1+7	BfS + UniPv	4,52	49	60
2.6	Creating a Strategic Research Agenda on Social Sciences, humanities and Safety Culture in Radiation Protection	3	SCK-CEN	4,9	49	60

2.7	Research and innovation supporting the implementation of the revised European Basic Safety Standards	15	NRIRR	5,64	49	60
			Total WP2	**40,75**		
WP3						
3.1	Integration of SRAs and priorities from platforms and national programmes (M1)	1	BfS	5,55	49	60
3.2	Joint priority setting of research and integrative activities; deliverable to WP4	3	SCK-CEN	5,55	49	60
3.3	Joint programming for a long term strategy of RP research in EUROPE	8	MELODI	5,55	49	60
			Total WP3	**16,65**		
WP4						
4.1	Set up Call Steering Committee (CSC) and Joint Call Secretariat (JCS).	4	ANR			
4.2	Identification of indicators to assess the efficiency of JTC	4	ANR	1,43	49	60
4.3	Implementation of the open call	4	ANR			
4.4	Monitoring of the calls and the funded projects	4	ANR	3,5	49	60
			Total WP4	**4,93**		
WP5						
5.1	Strategy for public and societal stakeholder engagement (	5	DH-PHE	7,85	49	60
5.2	Establish a stakeholder group	12	IRSN	1,25	49	60
5.3	Interaction with the civil society, including use of social media for stakeholder communication	12	ISS	1,35	49	60
5.4	Development of general and specialist information for the CONCERT website	5	DH-PHE	7,85	49	60
			Total WP5	**18,32**		
WP6						
6.1	Promote the visibility of key research infrastructures for R/D	29	NMBU	6,45	49	60
6.2	Harmonise Practices and protocols	23	RIVM	3,12	49	60
6.3	Strategy for facilitating access to infrastructures	6	CEA	4,05	49	60
			Total WP6	**13,62**		
WP7						
7.1	Attracting and retaining students and junior scientists into the Radiation Protection research fields	49	SU	3,36	49	60

7.2	Education and training as an essential part of dissemination and knowledge management within CONCERT	15	NRIRR	2,76	49	60
7.3	Targeted E&T initiatives	7	UniPv	2,88	49	60
7.4	Coordination and collaboration on E&T policy and strategy	3	SCK•CEN	4,07	49	60
7.5	European integration of junior scientist career development	18	HMGU	2,86	49	60
			Total WP7	**15,93**		
			Total Months ALL	**166,87**		

Activity No	**Activity Title**		**Total Person-Months of CONCERT POMs and LTPs active in the respective activity**		**Start Month**	**End month**
WP9					entire term of respective project	
9.1	CONFIDENCE			537,15	20	55
9.2	LDLensRad			336,5	20	58
9.3	TERRITORIES			374,45	20	55
9.4	ENGAGE			72,80	30	54
9.5	LEU-TRACK			134,8	29	58
9.6	PODIUM			138,45	32	55
9.7	SEPARATE			127	29	58
9.8	SHAMISEN-SINGS			58,65	29	55
9.9	VERIDIC			23,50	33	56
				1803,30		

1.1.13 Annual Deliverables List (table 2.3.c)

- **The table below lists all 91 CONCERT deliverables for the final year (M49-M60)**

Deliverable No	Deliverable Name	Lead Beneficiary	Type	Dissemination Level	Due Date (months)
D9.23	Prioritisation of preferences. Transnational stakeholder surveys results	CIEMAT	R	Public	M49
D9.30	Stakeholders' preferences and criteria for uncertainty management	NERIS	R	Public	M49
D9.40	Long term Scheimpflug lens imaging	HMGU	R	Public	M49
D9.41	Mouse stress, communication studies	HMGU	R	Public	M49
D9.42	Mouse DNA damage studies	HMGU	R	Public	M49
D9.43	Mouse proliferation/morphology studies	HMGU	R	Public	M49
D9.44	Mouse molecular studies	HMGU	R	Public	M49
D9.45	In vitro stress, communication studies	DH	R	Public	M49
D9.46	In vitro DNA damage studies	DH	R	Public	M49
D9.47	In vitro proteomic, biochemical studies	DH	R	Public	M49
D9.63	Guidance about exposure scenario	DH	R	Public	M49
D9.64	Social and ethical aspects	SCK-CEN	R	Public	M49
D9.66	Stakeholders panels results/France	IRSN	R	Public	M49
D9.67	Stakeholders panels results/Spain	CIEMAT	R	Public	M49
D9.68	Stakeholders panels results/Belgium	SCK-CEN	R	Public	M49
D9.69	Critical evaluation/remediation pathways	NERIS	R	Public	M49
D9.70	Framework for socio-economic analysis	NRPA	R	Public	M49
D9.111	Report summarizing the feasibility of the methods, and the accuracy of personal dosimetry in the real workplace	DH	R	Public	M49
D9.112	Document with the criteria for the approval of online dosimetry as legal dosimetry system	EEAE	R	Public	M49
D9.59	Radiological state database of sites	DH	Other	Public	M50
D9.61	Guidance to select level of complexity	NRPA	R	Public	M50
D9.86	Report on stakeholder engagement in radiation protection: transversal issues and specifics of different exposure situations	JSI	R	Public	M50
D9.87	Final report on case studies, including recommendations and guidelines on building and enhancing radiation protection culture	IRSN	R	Public	M50
D9.96	Evaluating leukaemia risk in irradiated +/- EV-treated animals	NRIRR (OSSKI)	R	Public	M50
D9.7	Report on uncertainty reduction in external exposure assessment based on environmental monitoring data, including concept for identifying critically exposed groups	BFS	R	Public	M51
D9.88	Dissemination workshop	VUJE	Other	Public	M51
D9.48	Histopathological analyses	HMGU	R	Public	M52
D9.49	Behavioural analyses	HMGU	R	Public	M52

D9.89	Report on venues, challenges, opportunities and recommendations for stakeholder engagement in the medical field	NERIS	R	Public	M52
D9.90	Report on venues, challenges, opportunities and recommendations for stakeholder engagement in emergency and recovery preparedness and response	JSI	R	Public	M52
D9.91	Report on venues, challenges, opportunities and recommendations for stakeholder engagement in relation to indoor radon exposure	SCK-CEN	R	Public	M52
D9.126	Data set on proteomic and metabolomic changes in control, irradiated and shielded tissues	HMGU	R	Public	M52
D9.127	Data set on NGS-based miRNomes analysis in control, irradiated and shielded tissues	ENEA	R	Public	M52
D9.136	Guidelines/concept for dose measurement apps and tools	ISS	R	Public	M52
D9.137	Preparation of core protocol for an APP to collect information on health and welfare	CIEMAT	R	Public	M52
D9.138	Concept/guidelines for apps and tools for dose measurement and health and well-being monitoring	SCK-CEN	R	Public	M52
D9.139	Tutorials for apps and tools, including database management plan	SCK-CEN	R	Public	M52
D9.140	If feasible, Prototype APP for health and welfare monitoring, diet, space-time distribution	SCK-CEN	Demo	Public	M52
D9.5	Guidelines for the use of ensemble calculations in an operational context, indicators to assess the quality of uncertainty modelling and ensemble calculations, and tools for ensemble calculation for use in emergency response	RIVM	R	Public	M53
D9.6	Software tool which allows the propagation of uncertainties to dose assessment models (in collaboration with Subtask 9.1.3)	BFS	Other	Public	M53
D9.10	Paper on external dosimetry using personal objects	HMGU	R	Public	M53
D9.12	Report on the risk assessment tool	HMGU	R	Public	M53
D9.15	An evaluation of process based models and their application in food chain assessments	SCK-CEN	R	Public	M53
D9.16	Evaluation of the importance of hot particles in radioecological models	NRPA	R	Public	M53
D9.27	Paper on mental models associated to uncertainty management	JSI	R	Public	M53
D9.28	Report on observational studies of emergency exercises	EEAE	R	Public	M53
D9.29	Guidelines on tools for communication of uncertainties	SCK-CEN	R	Public	M53
D9.31	Report on international experts' dialogues	NRPA	R	Public	M53

D9.113	Report from the feasibility study performed in two hospitals	SCK-CEN	R	Public	M53
D2.13	Updating SRAs of MELODI, ALLIANCE, NERIS and EURADOS	UEF	R	Public	M54
D9.24	Guidelines and recommendations for decision making during the transition phase	CIEMAT	R	Public	M54
D9.32	Recommendations for improved communication and stakeholder involvement related to uncertainties	SCK-CEN	R	Public	M54
D9.36	Report from stakeholder panels and workshops related to the application of the methods and tools developed in ST 9.1.6	NRPA	R	Public	M54
D9.37	Visualisation approaches developed and tested in workshops and panels	HMGU	Other	Public	M54
D9.76	After each training_3rd year	CIEMAT	R	Public	M54
D9.92	Knowledge base report	VUJE	R	Public	M54
D9.93	Operation of the ENGAGE project	SCK-CEN	R	Public	M54
D9.94	Final report of the ENGAGE project	SCK-CEN	R	Public	M54
D9.97	Evaluating major cellular and molecular mechanisms mediated by irradiated EVs	NRIRR (OSSKI)	R	Public	M54
D9.98	Identification of human EV-related leukaemia markers and radiation exposure markers	DH	R	Public	M54
D9.114	Report summarizing the experimental and clinical findings when using the online dosimetry application	SCK-CEN	R	Public	M54
D9.115	Workshop for the dissemination of the results and the application of the ALARA	EEAE	Other	Public	M54
D9.128	Report on the status of publications and manuscripts	ENEA	R	Public	M54
D9.17	CONFIDENCE: Overview of model improvements and future needs	DH	R	Public	M55
D9.39	Operating the CONFIDENCE project for 36 months	HMGU	R	Public	M55
D9.50	Creation of statistical model	DH	R	Public	M55
D9.54	Progress summary and actions-3rd year	DH	R	Public	M55
D9.57	Year 3 advisory panel report	DH	R	Public	M55
D9.58	Collate D107-D117 and ready for submission	DH	R	Public	M55
D9.71	Guidance for management/post-accident	IRSN	R	Public	M55
D9.72	Guidance for management/NORM	IRSN	R	Public	M55
D9.116	Fluence to dose conversion coefficients for reference phantoms and postures other than standing for photons and neutrons	HMGU	Other	Public	M55
D9.117	Fluence to dose conversion coefficients for non-reference phantoms for photons and neutrons	HMGU	Other	Public	M55
D9.118	User-friendly online application + manual and source code	SCK-CEN	Websites, patents filling, etc.	Public	M55
D9.119	Report summarizing the computational developments needed to realise full online dosimetry using simulation of voxel phantoms in the workplace.	DH	R	Public	M55

D9.120	Exploitation Plan	EEAE	R	Public	M55
D9.121	Final report of the PODIUM project	SCK-CEN	R	Public	M55
D9.99	Final report of the LEU_TRACK project	NRIRR (OSSKI)	R	Public	M56
D9.100	Report on LEU-TRACK related dissemination and training activities	HMGU	R	Public	M56
D9.129	Final report of the SEPARATE project	ENEA	R	Public	M56
D9.142	Dosimeter calibration and measurement uncertainties in IC	CEA	R	Public	M56
D9.143	Acceptance and Quality control protocol; accuracy of the tested SDC software tools	SCK-CEN	R	Public	M56
D9.144	Collected procedures and recommendation for dose optimisation	SCK-CEN	R	Public	M56
D1.5	Fifth periodic reports to the EC in accordance with the provisions of the consortium contract	BFS	R	Public	M57
D3.6	If extra funding is available: Fifth Annual Joint Priority List	SCK-CEN	R	Public	M57
D1.6	Final report of the consortium	BFS	R	Public	M60
D4.3	Analysis on the assessment of final reports of CONCERT funded projects under CONCERT open RTD Call 1	ANR	R	Public	M60
D4.6	Analysis on the assessment of final reports of CONCERT funded projects under CONCERT open RTD Call 2	ANR	R	Public	M60
D6.6	Publishing the web-Handbook including protocols issued from harmonization procedures	CEA	R	Public	M60
D7.5	5th Annual report on awards and grants given	UNIPV	R	Public	M60
D7.16	Final report on the coordination and collaboration on E&T policy and strategy in radiation protection related themes	UNIPV	R	Public	M60

Resources to be committed

1.1.14 Summary effort table (Table 2.3.d)

WP1		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per
1	BfS	30,00	3,50	3,50	3,50	3,50	2,50	1,50	2,00	1,00	51,00
2	STUK		0,03	0,03	0,03	0,03	0,03			0,03	0,17
3	SCK•CEN								0,60		0,60
4	ANR					0,60					0,60
5	DH-PHE								0,20		0,20
6	CEA		0,02	0,02	0,02	0,02	0,02			0,02	0,10
7	UniPv		0,02	0,02	0,02	0,02	0,02			0,02	0,10
12	IRSN		0,02	0,02	0,02	0,02	0,02			0,02	0,10
13	SSM		0,02	0,02	0,02	0,02	0,02			0,02	0,10
14	Ciemat		0,02	0,02	0,02	0,02	0,02			0,02	0,10
15	NRIRR		0,02	0,02	0,02	0,02	0,02			0,02	0,10
16	MTA EK		0,02	0,02	0,02	0,02	0,02			0,02	0,10
17	NCRRP		0,02	0,02	0,02	0,02	0,02			0,02	0,10
18	HMGU		0,02	0,02	0,02	0,02	0,02			0,02	0,10
19	MUW		0,02	0,02	0,02	0,02	0,02			0,02	0,10
20	ENEA		0,03	0,03	0,03	0,03	0,03			0,03	0,16
21	ISS		0,02	0,02	0,02	0,02	0,02			0,02	0,10
22	NRPA		0,02	0,02	0,02	0,02	0,02			0,02	0,10
23	RIVM		0,02	0,02	0,02	0,02	0,02			0,02	0,10
24	FTC							0,20			0,20
25	IMROH							0,20			0,20
26	SURO		0,02	0,02	0,02	0,02	0,02			0,02	0,10
27	IFA							0,60			0,60
28	EEAE		0,02	0,02	0,02	0,02	0,02			0,02	0,10
29	VUJE							0,20			0,20
30	UT							0,20			0,20
31	RSC							0,20			0,20
32	UL		0,02	0,02	0,02	0,02	0,02			0,02	0,10
33	UEF		0,04	0,04	0,04	0,04	0,04			0,04	0,23
34	GIG		0,02	0,02	0,02	0,02	0,02			0,02	0,13
35	MINECO		0,02	0,02	0,02	0,02	0,02			0,02	0,13
36	APA		0,02	0,02	0,02	0,02	0,02			0,02	0,13
37	JSI		0,02	0,02	0,02	0,02	0,02			0,02	0,13
38	FOPH										0,00
39	EPA										0,00
40	DEMA										0,00
41	EURAMED										0,00

WP2		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per
33	UEF	0,80	0,80	0,80		0,80		0,80			4,00
1	BfS	0,75	0,75	0,75		0,75	0,75	0,75			4,50
2	STUK	0,40	0,40	0,40		0,40		0,40			1,99
	· UTA	0,20									0,20
3	SCK•CEN		1,13	1,13	1,13		1,13				4,50
5	DH-PHE	0,48		0,48	0,48						1,45
6	CEA	0,30	0,30								0,60
7	UniPv	1,05				1,05					2,10
8	MELODI										
	· SU	0,20									0,20
9	ALLIANCE										
	· CEH										
10	NERIS										
	· DTU			0,20							0,20
	· MUTADIS			0,20			0,20				0,40
	· UMIL						0,20				0,20
11	EURADOS										
	· PTB				0,20						0,20
	· IST				0,20						0,20
	· RBI				0,20						0,20
	· IFJ PAN				0,20						0,20
	· SL				0,20						0,20
12	IRSN	0,52	0,52	0,52	0,52	0,52	0,52	0,52			3,67
	· CEPN			1,00			1,00				2,00
14	CIEMAT		1,00	0,20	0,20						1,40
	· ISGlobal	0,20				0,20					0,40
15	NRIRR							1,50			1,50
16	MTA EK	0,50									0,50
18	HMGU	0,57	0,57		0,57						1,70
	· KIT			1,00							1,00
	· HZDR		0,50								0,50
19	MUW					0,20					0,20
20	ENEA	0,27			0,27						0,54
21	ISS				0,20	0,20	0,20	0,20			0,80
22	NRPA			0,20		0,20	0,20				0,60
	· NMBU-IMT						0,20				0,20
23	RIVM							0,20			0,20
25	IMROH						0,20	0,20			0,40
26	SURO										
	· CTU	0,20				0,20					0,40

	· NRI							0,20			0,20
	· UJF	0,60									0,60
28	EEAE						0,10				0,10
	· NCSRD	0,25									0,25
	NTUA	0,25									0,25
29	VUJE			0,20			0,20	0,20			0,60
30	UT							0,20			0,20
32	UL		0,20								0,20
	· RTU	0,03									0,03
34	GIG							0,13			0,13
36	APA							0,33			0,33
40	DEMA										
	PDC-AGROS		0,25								0,25
	DMI		0,25								0,25

WP3		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per Participant
1	BFS	0,20	0,20	0,20							0,60
2	STUK	0,03	0,03	0,03							0,10
	· UTA	0,07	0,07	0,07							0,20
3	SCK-CEN	1,60	1,60	1,60							4,80
4	ANR	0,01	0,01	0,01							0,02
5	DH-PHE	0,48	0,48	0,48							1,45
	· DurhamUni										
	· MetOffice										
	· OBU										
	· WarwickUni										
6	CEA	0,15	0,15	0,15							0,44
7	UNIPV	0,15	0,15	0,15							0,44
8	MELODI										
	· SU	0,01	0,01	0,01							0,02
9	ALLIANCE										
	· CEH										
10	NERIS										
	· DTU	0,01	0,01	0,01							0,02
	· MUTADIS	0,01	0,01	0,01							0,02
	· UMIL	0,01	0,01	0,01							0,02
11	EURADOS										

	· PTB	0,01	0,01	0,01							0,02
	· IST	0,01	0,01	0,01							0,02
	· RBI	0,01	0,01	0,01							0,02
	· IFJ PAN	0,01	0,01	0,01							0,02
	· SL	0,01	0,01	0,01							0,02
12	IRSN	0,50	0,50	0,50							1,50
	· CEPN	0,17	0,17	0,17							0,50
	· ENSTII	0,01	0,01	0,01							0,02
13	SSM	0,01	0,01	0,01							0,02
14	CIEMAT	0,15	0,15	0,15							0,44
	· ISGlobal	0,01	0,01	0,01							0,02
15	NRIRR	0,15	0,15	0,15							0,44
16	MTA-EK	0,15	0,15	0,15							0,44
17	NCRRP	0,12	0,12	0,12							0,35
18	HMGU	0,15	0,15	0,15							0,44
	· KIT	0,17	0,17	0,17							0,50
	· GSI	0,01	0,01	0,01							0,02
	· Juelich	0,01	0,01	0,01							0,02
	· HZDR	0,01	0,01	0,01							0,02
19	MUW	0,02	0,02	0,02							0,05
20	ENEA	0,20	0,20	0,20							0,60
21	ISS	0,05	0,05	0,05							0,14
22	NRPA	0,05	0,05	0,05							0,14
	· NMBU-IMT	0,08	0,08	0,08							0,25
23	RIVM	0,05	0,05	0,05							0,14
25	IMROH	0,01	0,01	0,01							0,02
26	SURO	0,07	0,07	0,07							0,20
	· CTU	0,01	0,01	0,01							0,02
	· NRI	0,11	0,11	0,11							0,32
	· UJF	0,13	0,13	0,13							0,40
27	IFA-MG										
	· IFIN-HH	0,04	0,04	0,04							0,12
28	EEAE	0,01	0,01	0,01							0,02
	· NCSRD	0,01	0,01	0,01							0,03
29	VUJE	0,01	0,01	0,01							0,02
30	UT	0,01	0,01	0,01							0,02
31	RSC	0,01	0,01	0,01							0,02
32	UL										
	· RTU	0,01	0,01	0,01							0,02
33	UEF	0,16	0,16	0,16							0,47
34	GIG	0,04	0,04	0,04							0,13
37	JSI	0,11	0,11	0,11							0,33
	· FSS-Uni-LJ	0,02	0,02	0,02							0,07
40	DEMA										
	PDC-AGROS	0,03	0,03	0,03							0,08

	DMI	0,03	0,03	0,03							0,08

WP4		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per Participant
4	ANR		1,00		2,00						3,00
13	SSM		0,15		0,65						0,80
24	FCT		0,15		0,65						0,80
35	MINECO		0,13		0,20						0,33

WP5		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per Participant
5	**DH-PHE**	6,60			6,60						13,20
1	BfS	0,03	0,03	0,03	0,03						0,10
2	STUK	0,01	0,01	0,01	0,01						0,05
3	SCK-CEN	0,25	0,25	0,25	0,25						1,00
12	IRSN	0,38	0,38	0,38	0,38						1,50
21	ISS	0,25	0,25	0,25	0,25						1,00
22	NRPA										
	· NMBU-IMT	0,13	0,13	0,13	0,13						0,50
29	VUJE	0,13	0,13	0,13	0,13						0,50
32	UL			0,10							0,10
33	UEF	0,09	0,09	0,09	0,09						0,37

WP6		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per Participant
6	**CEA**	3,50	1,50	3,00							8,00
1	Bfs	IK	0,25	IK							0,25
2	STUK	0,15	IK	IK							0,15
3	SCK-CEN	IK	0,40	IK							0,40
7	UniPV	IK	IK	0,40							0,40
8	MELODI										
	· SU	0,15	IK	IK							0,15
12	IRSN	0,25	IK	IK							0,25
14	CIEMAT	0,40	IK	IK							0,40
16	MTA-EK	IK	0,40	IK							0,40
17	NCRPP	0,15	IK	IK							0,15
18	HMGU	IK	IK	0,50							0,50
	· KIT	0,15	IK	IK							0,15
	· GSI	0,15	IK	IK							0,15
21	ISS	0,15	IK	IK							0,15
22	NRPA	0,15	IK	IK							0,15
	· NMBU-IMT	0,50	IK	IK							0,50
23	RIVM	IK	0,50	IK							0,50
26	SURO										
	· CTU	0,15	IK	IK							0,15
28	EEAE	0,15	IK	IK							0,15
32	UL			0,15							0,15
33	UEF	0,45	IK	IK							0,45
34	GIG	IK	0,07	IK							0,07

WP7		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person/ Months per Participant
7	**UniPv**	1,60	1,60	1,60	1,60	1,60					8,00
1	BfS				0,40						0,40
3	SCK-CEN	0,25	0,25	0,25	0,25						1,00
6	CEA		0,05	0,05	0,05	0,05					0,20
8	MELODI										
	· SU	0,80	0,10	0,10							1,00
11	EURADOS										
	· IST	0,07			0,07	0,07					0,20
12	IRSN										
	· ENSTII				0,20						0,20
14	CIEMAT					0,20					0,20
	· ISGlobal		0,07	0,07	0,07						0,20
15	NRIRR	0,20	0,20	0,20	0,20	0,20					1,00
16	MTA-EK	0,04	0,04	0,04	0,04	0,04					0,20
17	NCRRP		0,07	0,07		0,07					0,20
18	HMGU	0,25		0,25	0,25	0,25					1,00
	· Juelich				0,20						0,20
19	MUW	0,05	0,05	0,05		0,05					0,20
20	ENEA				0,24						0,24
22	NRPA										
	· NMBU-IMT	0,04	0,04	0,04	0,04	0,04					0,20
25	IMROH				0,10	0,10					0,20
28	EEAE		0,07		0,07	0,07					0,20
29	VUJE		0,07		0,07	0,07					0,20
30	UT	0,07			0,07	0,07					0,20
33	UEF		0,16	0,16	0,16						0,49

This table shows the total efforts of CONCERT partners in the respective project over its entire term.

WP9		Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Total Person Month/entire term of respective project
1	BFS	7,00		12,50	8,00						27,50
2	STUK	5,50		6,50							12,00
3	SCK-CEN	44,85		29,70	16,75		35,50			10,00	136,80
	Ulg				2,00						2,00
5	DH	21,00	101,00	20,50		20,30	24,15				186,95
	· DurhamUni		27,50								27,50
	· MetOffice	13,00									13,00
	· OBU		28,00					32,00			60,00
	· WarwickUni	3,00									3,00
6	CEA									10,00	10,00
9	ALLIANCE										
	· CEH	28,80									28,80
10	NERIS										
	· DTU	14,50									14,50
	· MUTADIS	11,00		6,50							17,50
	· UMIL	7,00			9,50						16,50
11	EURADOS										
	· IST	7,75									7,75
	· RBI									1,50	1,50
12	IRSN	20,75		88,75	2,50				3,00		115,00
	· CEPN	15,00		22,00	10,25				1,00		48,25
14	CIEMAT	48,75		64,00							112,75
	· ISGlobal				3,95				37,65		41,60
	UPC						34,80				34,80
15	NRIRR (OKI)					80,00					80,00
16	MTA EK	10,00									10,00
18	HMGU	66,50	96,00			34,50	12,00	35,00			244,00
	· KIT	44,00									44,00
20	ENEA		84,00					60,00			144,00
21	ISS								15,00		15,00

22	NRPA	61,00		41,00							102,00
	· NMBU-IMT	37,25		27,50					2,00		66,75
23	RIVM	9,75									9,75
27	IFA-MG										
	· IFIN-HH				2,00						2,00
28	EEAE	23,75			5,00		32,00			2,00	62,75
29	VUJE	24,75			6,50						31,25
30	UT			55,50							55,50
36	APA	5,50									5,50
37	JSI				3,85						3,85
	· REC	6,75									6,75
38	FOPH				2,50						2,50
										WP9	**1803,30**

1.1.15 Other major cost items (travel, equipment, infrastructure, goods and services) (Table 2.3e)

WP1

Participant BfS **Number/Short Name**	**Cost (€)**	**Justification**
Travel	6000	joining 4 SRA meetings organised by WP2 as T3,1 leader
Goods and services	12000 2000	CONCERT homepage (public, restricted, newsletter), meeting room cost
Total	20000	

WP2

Participant SCK•CEN **Number/Short Name**	**Cost (€)**	**Justification**
Travel	5000	joining 4 SRA meetings organised by WP2 as T3,2 leader
Goods and services	5000	Printing cost for the promotion of CONCERT
Total	5000	

15/CIEMAT	**Cost (€)**	**Justification**
Travel	2000	Travel to the two workshops to support the activities of WP2
Total	2000	

WP3

Participant SCK•CEN **Number/Short Name**	**Cost (€)**	**Justification**
Travel	5000	joining 4 SRA meetings organised by WP2 as T3,2 leader
Total	5000	

Participant ALL (52) **Number/Short Name**	**Cost (€)**	**Justification**
Travel	500	travel and subsidence to open workshop
Total	26000	

Participant MELODI Number/Short Name	Cost (€)	Justification
Travel	40000	Open workshop organiser
Total	40000	

WP4

Number/Short Name	Cost (€)	Justification
Travel	5500	For the partners of WP4
Total	5500	

WP6

CEA total eligible costs under these categories do not exceed 15% of the personnel costs,

LTP NMBU/ NRPA	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

12/IRSN	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

15/CIEMAT	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

25/RIVM	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

1/BfS	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

17/MTA-EK	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

3/SCK-CEN	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

7/UniPV	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

2/STUK	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

18/HMGU	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

21/ISS	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

LTP KIT/HMGU	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

28/EEAE	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

LTP SU/MELODI	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

22/NRPA	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

17/NCRPP	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

LTP GSI/HMGU	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

LTP CTU-FBME/SURO	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

32/UL	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

33/UEF	Eligible Cost (€)	Justification
Travel	2000	Travel to the workshops to support the activities of WP6
Total	2000	

Planned activities for the fifth year

The activities of the CONCERT EJP in the beginning were dominated by the cyclical workflow of CONCERT to develop and implement the open scientific calls. There was a public call in 2016 and 2017 on current research priorities from all areas of radiation protection. Altogether nine research projects are funded by CONCERT. All of them were kicked off and monitored since. In the last year of CONCERT, efforts will be devoted to keep track of tasks and project work and measure progress against predefined goals. Through intensive collaboration with the nine CONCERT project-coordinators CONCERT ensures the smooth running of all CONCERT funded projects as well as to complete the projects and CONCERT itself in a timely and successful way.

Progress will be reported on an ongoing basis through deliverables. Assessing the progress achieved within the projects, along with the progress made with regard to other CONCERT activities, will enable to determine what are possible gaps and missing tasks/activities, in order to realise the full potential and objectives of the future respective research in the radiation protection area.

All CONCERT WP are integrated into this cyclical work flow, which is in principle designed to start with an evaluation of the joint strategic research agenda (WP2), the formulation of research priorities by joint programming (WP3) and finally the funding (WP4 and WP1) and monitoring of research projects (WP4) which fulfil all the requirements of scientific excellence and integration. Cross-cutting through this cyclical work flow are WP dedicated to integration activities which on one side have input through interfaces into the cyclical work flow and on the other side have the target for a sustainable support of radiation protection research. These principle work flows, one cyclical, one more or less continuous are described in the CONCERT proposal and will be repeated as in previous years of the CONCERT EJP (with the assumption that a CONCERT follow up EJP will be announced).

WP 1 Project coordination & management

The main coordination tasks will be to organise the successful completion of the nine funded research projects, the timely submission of project deliverables, and particularly, to collect all necessary material for the last annual reporting and final reporting to the European Commission.

WP 2 INTEGRATION AND SRA DEVELOPMENT IN RADIATION PROTECTION RESEARCH

As there will be no further calls, CONCERT WP2 focuses on the final updates of SRAs of MELODI, ALLIANCE, NERIS, EURADOS and EURAMED by month 54 and continue working on the long-term roadmaps and integrative activities.

WP 3 Priority research and Joint programming needs in the perspective of European Integration

As there are no resources for a further call in CONCERT, WP3 will in the 5th year only concentrate on the finalisation of the joint roadmap in radiation protection research based on stakeholder consultations organised with WP5, resuming the activities of the WP2-WP3 working group to get to a final version.

WP 4 Organisation and management of CONCERT open RTD calls

In the fifth year, the follow-up and monitoring of projects funded in the two CONCERT calls will be continued and finalised. Final scientific reports will be available in March 2020. WP4 will review the success of both CONCERT calls by organising the evaluation of research projects and the outcome of the respective studies by an independent review panel of 4-6 international independent experts.

WP5 Stakeholder involvement and communication in radiation protection research

Over the course of year 5 CONCERT WP5 aims to (i) organise and run further stakeholder meetings (ii) finalise the analysis of the survey results and disseminate the findings (iii) further develop and refine the public facing website information in light of comments received from internal and external stakeholders.

WP6 Access to Infrastructures

Work with representatives of different institutions/countries will be initiated to identify their infrastructures that are not currently listed and could be included in the database AIR²D², and WP6 will continue to publish the bulletin (to the 40th). Work to strengthen STORE will continue. Some voluntary infrastructures (exposure platforms) will develop together in close collaboration with WP7 to meet the infrastructure package about visits of (and/or courses on) some infrastructure facilities during the training sessions for students and postdocs. Actions to build a roadmap including funding possibilities to support access to some pilot infrastructures will be proposed.

WP7 Education and training

In the 5th year, the rolling calls for student travel grants and provision of short courses will continue. The E&T activities carried out in the projects funded in the two CONCERT calls will be reviewed. An E&T Forum will be held as part of the ERPW 2019 in Stockholm, to further develop the links already established with other E&T initiatives. A programme to attract young scientists into the research area will be included in the programme of ERPW 2019.

WP9

The research activities by the nine projects selected through the two open calls for research projects organised along the CONCERT will be monitored. Progress will be reported on an ongoing basis through deliverables. The first reporting period for the six projects of the 2017 call are set for month 42-44. The results of their first reporting will feed into the fourth periodic report of CONCERT 2019.
The respective project coordinators will coordinate and direct project resources.