



IGRP

2020 Annual Report

Established in Stockholm 27 July 1928



ICRP 2020 Annual Report

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CHAIR'S FOREWORD



In 2020, the world faced the worst global health crisis in decades as COVID-19 brought unprecedented challenges, the consequences of which will remain with us for years to come. My thoughts, and those of my ICRP colleagues, are with those who lost their lives or loved ones, and the countless people negatively impacted throughout this pandemic. I remain optimistic that ongoing vaccination programmes will mean the world can return to its new normal however, and whenever that may be.

Despite the restrictions presented by COVID-19, ICRP was able to continue its work with minimal disruption. Our face-to-face meetings may have been cancelled but the Main Commission, Scientific Secretariat, Committees, and Task Groups continued to interact via videoconferencing. Although this meant early starts and late finishes for some, members rose to the challenge. In addition, ICRP welcomed Charlotte White, our Brand and Digital Media Specialist, to the staff of the Scientific Secretariat.

January 1st saw the culmination of the Free the Annals campaign, as all but the most recent two-years of ICRP Publications became free-to-access for everyone, everywhere. As you will see later in this report, the response was even better than we envisaged. Thanks to the support of organisations and individuals from all over the world, two-year-old publications will become freely available at the beginning of every year, indefinitely.

In late 2020, ICRP organised the International Conference on Recovery After Nuclear Accidents: Radiological Protection Lessons from Fukushima and Beyond, hosted by Japan Atomic Energy Agency (JAEA), and in association with several Japanese, international, and other organisations. This virtual experience attracted over 2500 delegates from more than 100 countries, marking an unprecedented level of

participation. Nearly all the presentations, and on-demand content, are still available to access at www.icrperecovery.org.

ICRP has begun a review and revision of the System of Radiological Protection and is engaging and consulting with more people and organisations than ever before. As the stewards of the System, we understand the importance of input from relevant stakeholders, and the need to take time to listen and consider all views. This engagement process will in itself be a challenge, and success can only be guaranteed through a collective effort.

I will be stepping down from ICRP at the end of June 2021, after serving as Chair for the last 12 years. 1 July 2021 will be the commencement of the next four-year term with a new Chair, Vice-Chair, Main Commission, and Committees. Hence, this is my final 'foreword' and, without wishing to reminisce in detail, I should also consider a short 'backward'. It has been an honour and privilege to serve as the Chair of ICRP. I would like to thank all members for their dedication and support that has made the journey together possible. I have met and worked with many incredible people, some of whom will remain lifelong friends. ICRP has changed considerably and is now in a strong position to face the future. I have every confidence that the new Main Commission will work tirelessly to deliver the next set of fundamental recommendations. I have often quoted that you cannot drive forward by always looking in the rear-view mirror and know that, as ICRP heads for its centenary, it will revise the System of Radiological Protection so that it will remain robust and practicable for many years to come.

A handwritten signature in black ink that reads "Claire Cousins".

Claire Cousins
ICRP Chair

THE SYSTEM OF RADIOLOGICAL PROTECTION

ICRP develops the System of Radiological Protection for the public benefit. The System takes account of the latest scientific knowledge, ethical values, and practical experience. It is the basis of standards, legislation, guidance, programmes, and practice worldwide.

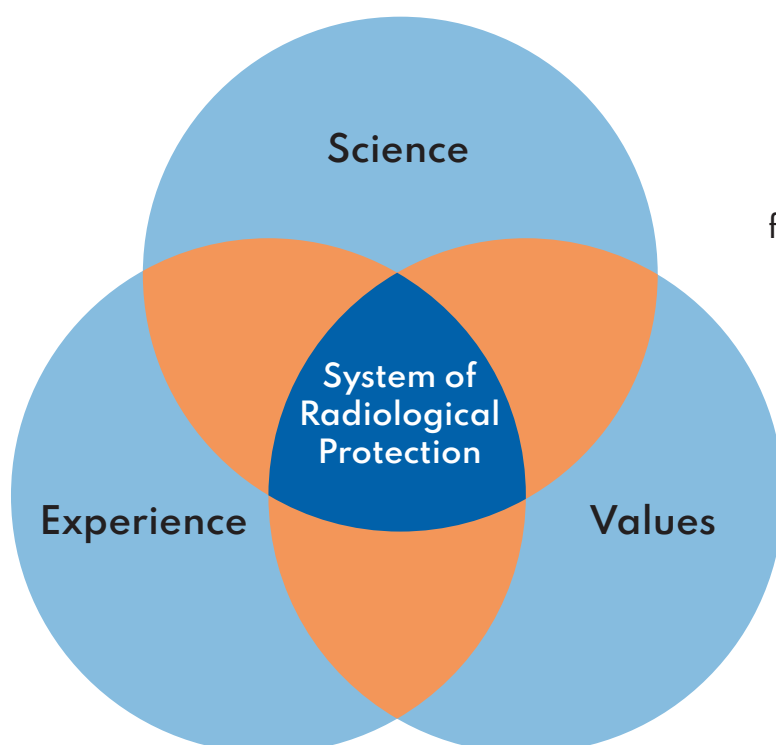
The objective of the System is to contribute to an appropriate level of protection for people and the environment against the harmful effects of ionising radiation exposure without unduly limiting the individual or societal benefits of activities involving radiation.

The System of Radiological Protection is based on the latest science, social and ethical values, with over a century of experience since the discovery of ionising radiation.

ICRP recommendations are used worldwide by intergovernmental and nongovernmental advisory and standard

setting agencies; government regulatory authorities; educational, scientific, and healthcare institutions; operators; individual professionals; and others with an interest in radiological protection.

The IAEA International Basic Safety Standards for Protection against Ionising Radiation and for the Safety of Radiation Sources is based heavily on ICRP recommendations, as are the similar European Basic Safety Standards. The International Labour Organization Convention 115, Radiation Protection Convention, General Observation 2015, refers specifically to the recommendations of ICRP.



The System of Radiological Protection forms the basis of radiological protection standards, regulations, programmes, and practice world-wide

RADIOLOGICAL PROTECTION FOR THE NEXT GENERATION

More than a decade since the current fundamental recommendations were released, ICRP has opened a review and revision of the System of Radiological Protection, ensuring it continues to protect people, animals, and the environment for the next generation.



THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

25
ACTIVE
TASK
GROUPS

30
FORMAL
RELATIONS

92
YEARS IN
OPERATION

146
NUMBERED
PUBLICATIONS

300
MEMBERS

Originally established at the Second International Congress of Radiology in 1928 as the International X-ray and Radium Protection Committee, today ICRP is an independent international charity registered in the UK, relying on financial contributions and support from governments, industry, agencies, foundations, and individuals from around the world.

ICRP consists of the Main Commission, the Scientific Secretariat, four standing Committees, and Task Groups established as needed to undertake specific work. Members come from over 40 countries and all disciplines relevant to radiological protection. They are invited to join ICRP as independent experts on a volunteer

basis for four-year terms. Representatives of organisations in formal relations with ICRP are regularly invited to both advise the Main Commission and to participate in meetings of the Committees. Individuals from these organisations may be invited to be members of Task Groups or to review drafts of work in progress where their expertise is particularly relevant.

This structure supports a rigorous system of peer review. The work of Task Groups is reviewed by the relevant Committee(s), and then reviewed and approved by the Main Commission. During development, most reports are circulated to several organisations and individual experts for critical review and all are posted for public consultation through the ICRP website.

MAIN COMMISSION

**SCIENTIFIC
SECRETARIAT**

COMMITTEE 1
Effects

COMMITTEE 2
Doses

COMMITTEE 3
Medicine

COMMITTEE 4
Application

TASK GROUPS

MAIN COMMISSION

The Main Commission consists of the Chair and up to twelve other members. The Main Commission is the governing body, setting the policy and programme of work, and approving all official publications.



Back Row (L-R): Michiaki Kai (Japan), Werner Rühm (Germany), Dominique Laurier (France), John Harrison (United Kingdom), Carl-Magnus Larsson (Australia), Sergey Romanov (Russian Federation), Simon Bouffler (United Kingdom)

Front Row (L-R): Kimberly Applegate (United States), Donald Cool (United States), Jacques Lochard (Vice-Chair, France), Claire Cousins (Chair, United Kingdom), Christopher Clement (Scientific Secretary*, Canada), Kunwoo Cho (South Korea), Senlin Liu (China)

*The Scientific Secretary has not been a Main Commission member since 1988, but continues to be integral to the work of the Main Commission, often serving as the representative of ICRP.

SCIENTIFIC SECRETARIAT

The Scientific Secretariat manages the daily business of ICRP, and the Scientific Secretary often represents ICRP at international meetings.



Top Row (L-R):

Christopher Clement, Scientific Secretary;
Lynn Lemaire, Executive Administrator;
Kelsey Cloutier, Development and
Communications Manager



Bottom Row (L-R):

Hiroki Fujita, Assistant Scientific Secretary;
Chunsheng Li, Assistant Scientific Secretary;
Charlotte White, Brand and Digital Media
Specialist

Not Pictured: Toshihiro Higuchi, Historian

COMMITTEE 1: EFFECTS

Committee 1 considers the effects of radiation action from the subcellular to population and ecosystem levels, including the induction of cancer, heritable and other diseases, impairment of tissue/organ function and developmental defects, and assesses implications for protection of people and the environment.



Back Row (L-R): Quanfu Sun (China), Mikhail Sokolnikov (Russian Federation), Michael Hauptmann (Netherlands), Andrzej Wojcik (Vice Chair, Sweden), Richard Wakeford (United Kingdom)

Front Row (L-R): Kazuo Sakai (Japan), Kotaro Ozasa (Japan), Gayle Woloschak (United States), Werner Rühm (Chair, Germany), Tamara Azizova (Russian Federation), Jacqueline Garnier-Lapace (Secretary, France), Sisko Salomaa (Finland)

NOT PICTURED: Dan Stram (United States), Preetha Rajaraman (India)

>
2020
Meeting
Summary

COMMITTEE 2: DOSE

Committee 2 develops dosimetric methodology for the assessment of internal and external radiation exposures, including reference biokinetic and dosimetric models and reference data and dose coefficients, for use in the protection of people and the environment.



Back Row (L-R): Jizeng Ma (Invitee from IAEA), Derek Jokisch (United States), Augusto Giussani (Germany), Alexander Ulanowski (Austria), Nina Petoussi-Henss (Germany), Wesley Bolch (Secretary, United States), Eric Blanchardon (France)

Front Row (L-R): François Paquet (Vice Chair, France), John Harrison (Chair, United Kingdom), Maria Antonia Lopez (Spain), Tracy Smith (United Kingdom), Tatsuhiko Sato (Japan), Volodymyr Berkovskyy (Ukraine), Chan Hyeong Kim (South Korea)

NOT PICTURED: Rich Leggett (United States), Junli Li (China)

>
2020
Meeting
Summary

COMMITTEE 3: MEDICINE

Committee 3 addresses protection of persons and unborn children when ionising radiation is used in medical diagnosis, therapy, and biomedical research, as well as protection in veterinary medicine.



Back Row (L-R): Keon Kang (South Korea), Sandor Demeter (Canada), David Sutton (United Kingdom), Reinhard Loose (Germany), Lodewijk van Bladel (Belgium), Yantao Niu (China)

Front Row (L-R): William Small (United States), Colin Martin (Vice Chair, United Kingdom), Kimberly Applegate (Chair, United States), Madan Rehani (Secretary, United States), Josep Marti-Climent (Spain), Makato Hosono (Japan)

NOT PICTURED: Marie-Claire Cantone (Italy), Michel Bourguignon (France), Jamila Alsuwaidi (UAE), Claudia Rube (Germany)

>
2020
Meeting
Summary

COMMITTEE 4: APPLICATION

Committee 4 provides advice on the application of the Commission's recommendations for the protection of people and the environment in an integrated manner for all exposure situations.



Back Row (L-R): Thierry Schneider (France), Miroslav Pinak (Invitee from IAEA), Catrin Koch (Sweden), Mike Boyd (United States), John Takala (Canada), François Bochud (Switzerland), Sergey Shinkarev (Russian Federation), David Copplestone (United Kingdom)

Front Row (L-R): Gillian Hirth (Australia), Eduardo Gallego (Spain), Toshimitsu Homma (Japan), Donald Cool (Chair, United States), Kathryn Highley (Vice-Chair, United States), Jean-François Lecomte (Secretary, France), Anne Nisbet (United Kingdom), Analia Canoba (Argentina), Yahong Mao (China), Nicole Martinez (United States)

NOT PICTURED: Nobuhiko Ban (Japan)

>
2020
Meeting
Summary

TASK GROUPS

Active as of 31 December 2020

TG 36

Radiation Dose to Patients in Diagnostic Nuclear Medicine

Chair:
Augusto Giussani

TG 64

Cancer Risk from Alpha Emitters

Co-Chairs:
Eric Blanchardon
Richard Wakeford

TG 72

RBE and Reference Animals and Plants

Chair:
Kathryn A. Higley

TG 79

Use of Dose Quantities in RP

Chair:
John Harrison

TG 89

Occupational RP in Brachytherapy

Chair:
Lawrence T. Dauer

TG 91

Radiation Risk Inference at Low-dose and Low-dose Rate Exposure for RP Purposes

Chair:
Werner Rühm

TG 95

Internal Dose Coefficients

Chair:
François Paquet

TG 96

Computational Phantoms and Radiation Transport

Chair:
Wesley E. Bolch

TG 97

Surface and Near Surface Disposal of Solid Radioactive Waste

Chair:
John Takala

TG 98

Exposures Resulting from Contaminated Sites from Past Industrial, Military and Nuclear Activities

Chair:
Michael Boyd

TG 99

Reference Animals and Plants (RAPs) Monographs

Chair:
Jacqueline Garnier-Laplace

TG 102

Detriment Calculation Methodology

Chair:
Nobuhiko Ban

TG 103

Mesh-type Reference Computational Phantoms (MRCP)

Chair:
Chan Hyeong Kim

TASK GROUPS

Active as of 31 December 2020

TG 105

Considering the Environment when Applying the System of RP

Chair:
David Copplestone

TG 106

Activities involving Mobile High Activity Sources

Chair:
Donald A. Cool

TG 108

Optimisation of RP in Digital Radiography, Fluoroscopy, and CT in Medical Imaging

Chair:
Colin Martin

TG 109

Ethics in RP for Medical Diagnosis and Treatment

Co-Chairs:
Marie-Claire Cantone
François Bochud

TG 110

RP in Veterinary Practice

Co-Chairs:
Lodewijk Van Bladel
Nicole Martinez

TG 111

Factors Governing the Individual Response of Humans to Ionising Radiation

Chair:
Simon Bouffler

TG 112

Emergency Dosimetry

Chair:
Volodymyr Berkovskyy

TG 113

Reference Organ and Effective Dose Coefficients for Common Diagnostic X-ray Imaging Examinations

Co-Chairs:
Nina Petoussi-Henss
Donald Sutton

TG 114

Reasonableness and Tolerability in the System of RP

Chair:
Thierry Schneider

TG 115

Risk and Dose Assessment for RP of Astronauts

Chair:
Werner Rühm

TG 116

RP Aspects of Imaging in Radiotherapy

Chair:
Colin Martin

TG 117

RP in PET and PET/CT

Chair:
Josep M. Martí-Climent

2020 HIGHLIGHTS

On the first of January, all but the last two years of ICRP publications were made free to access, thanks to the many organisations and individuals that supported the **Free the Annals** initiative.

Strategic Priorities for 2020-2024 were set, emphasising **review and refinement of the System of Radiological Protection**.

The **ICRP Foundation Fund** was established to foster the sustainability of ICRP's mission of advancing radiological protection for the public benefit, and to provide a mechanism for supporters who prefer to contribute to this long-term goal rather than the day-to-day activities of ICRP.

Although some ICRP work was stalled due to the **pandemic**, much of ICRP's work has been done remotely making adaptation to the circumstances less difficult.

The Main Commission meeting planned to be held in conjunction with IRPA 15 in May was cancelled, and the **first ever virtual meeting of the Main Commission** was held in November.

The new **ICRP Mentorship Programme** was highly successful with 17 mentees active in eight Task Groups in its first year, although the pandemic limited face-to-face contact.

ICRP held the virtual **International Conference on Recovery After Nuclear Accidents: Radiological Protection Lessons from Fukushima and Beyond** in December, hosted by Japan Atomic Energy Agency, originally planned to be held in Iwaki City (Fukushima), attracting more than 2500 people from over 100 countries.

Five **new ICRP publications** were released:

- ICRP Publication 146 Radiological Protection of People and the Environment in the Event of a Large Nuclear Accident
- ICRP Publication 145 Adult Mesh-type Reference Computational Phantoms
- ICRP Publication 144 Dose Coefficients for External Exposures to Environmental Sources
- ICRP Publication 143 Paediatric Computational Reference Phantoms
- Proceedings of the Fifth International Symposium on the System of Radiological Protection

ICRU Report 95 Operational Quantities for External Radiation Exposure was released, a joint report of ICRU and ICRP.

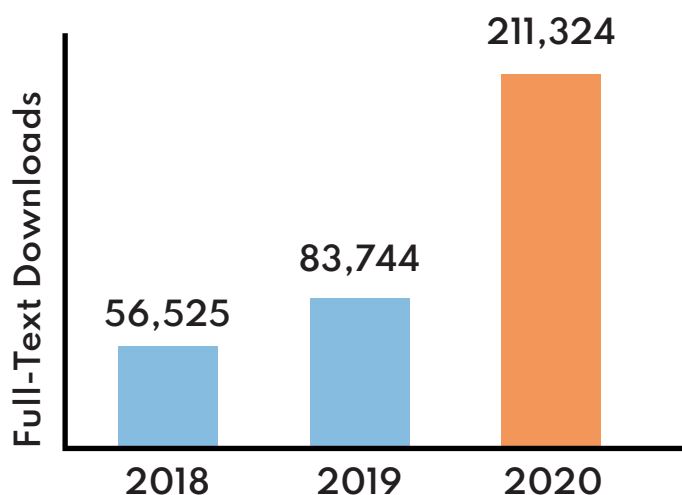
Two draft publications were released for **public consultation**, with consultation periods extended to accommodate pandemic challenges:

- Cancer Risk from Exposure to Plutonium and Uranium
- Radiation Detriment Calculation Methodology

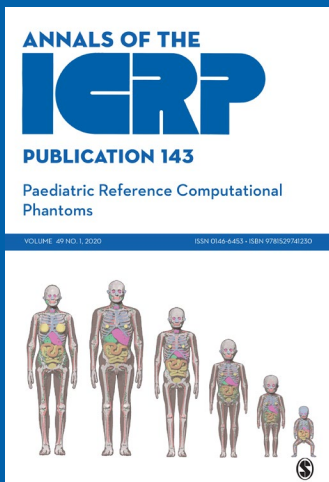
TOGETHER WE FREED THE ANNALS!

On 1 January 2020, all but the last two years of ICRP publications were made free to access.

This marked a permanent change to the way the world can access Annals of the ICRP. All issues of Annals of the ICRP are now free to download two years after their initial publication. This took effect at the end of 2019, when all of issues up to 2017 (up to ICRP Publication 137) became free-to-access. Almost immediately upon making 95% of our work free-to-access at the start of 2020, global downloads increased and it hasn't slowed down since. Thank you to everyone who contributed to this monumental success!



RELEASED IN 2020



PUBLICATION 143

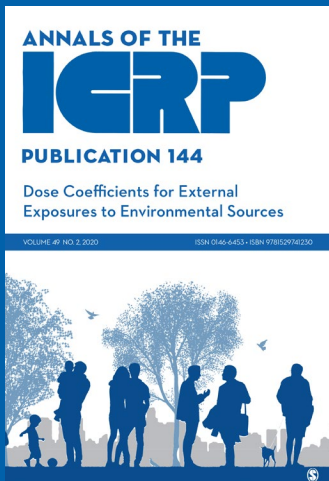
Paediatric Computational Reference Phantoms

Recommended citation

ICRP, 2020. Paediatric Computational Reference Phantoms. ICRP Publication 143. Ann. ICRP 49(1).

Authors on behalf of ICRP

W.E. Bolch, K. Eckerman, A. Endo, J.G.S. Hunt, D.W. Jokisch, C.H. Kim, K-P. Kim, C. Lee, J. Li, N. Petoussi-Henss, T. Sato, H. Schlattl, Y.S. Yeom, M. Zankl



PUBLICATION 144

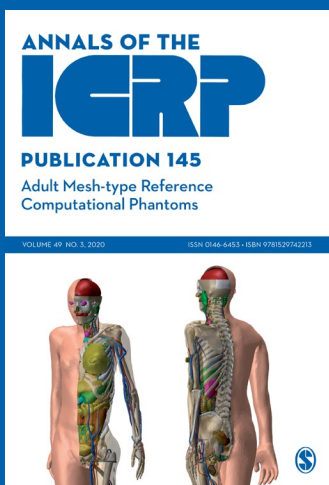
Dose Coefficients for External Exposures to Environmental Sources

Recommended citation

ICRP, 2020. Dose coefficients for external exposures to environmental sources. ICRP Publication 144. Ann. ICRP 49(2).

Authors on behalf of ICRP

N. Petoussi-Henss, D. Satoh, A. Endo, K.F. Eckerman, W.E. Bolch, J. Hunt, J.T.M. Jansen, C.H. Kim, C. Lee, K. Saito, H. Schlattl, Y.S. Yeom, S.J. Yoo



PUBLICATION 145

Adult Mesh-type Reference Computational Phantoms

Recommended citation

ICRP, 2020. Adult mesh-type reference computational phantoms. ICRP Publication 145. Ann. ICRP 49(3).

Authors on behalf of ICRP

C.H. Kim, Y.S. Yeom, N. Petoussi-Henss, M. Zankl, W.E. Bolch, C. Lee, C. Choi, T.T. Nguyen, K. Eckerman, H.S. Kim, M.C. Han, R. Qiu, B.S. Chung, H. Han, B. Shin

RELEASED IN 2020

PUBLICATION 146

Radiological Protection of People and the Environment in the Event of a Large Nuclear Accident

Recommended citation

ICRP, 2020. Radiological protection of people and the environment in the event of a large nuclear accident: update of ICRP Publications 109 and 111. ICRP Publication 146. Ann. ICRP 49(4).

Authors on behalf of ICRP

M. Kai, T. Homma, J. Lochard, T. Schneider, J.F. Lecomte, A. Nisbet, S. Shinkarev, V. Averin, T. Lazo

ICRP 2019 Proceedings

Proceedings of the Fifth International Symposium on the System of Radiological Protection

Recommended citation

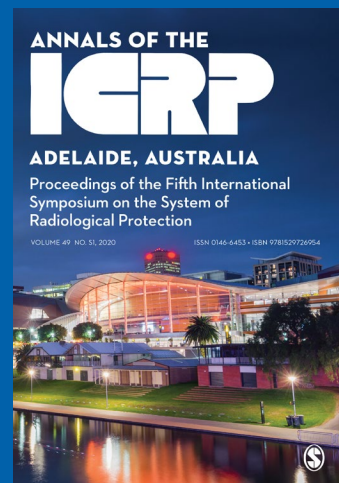
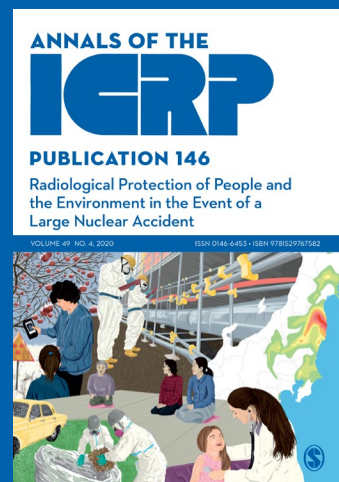
ICRP, 2020. Proceedings of the Fifth International Symposium on the System of Radiological Protection. Ann. ICRP 49(S1), 2020.

ICRU Report 95

Operational Quantities for External Radiation Exposure

Prepared jointly with ICRP

This Report recommends alternative definitions of the operational quantities that are better estimators of the protection quantities than those previously given, that instrument manufacturers and developers develop revised instruments that conform to these recommendations, and that international and national authorities recognize the need for a gradual and prudent period of adoption to balance the costs of implementation with the benefit of a more coherent system of operational quantities.



ICRP INTERNATIONAL CONFERENCE ON RECOVERY AFTER NUCLEAR ACCIDENTS

RADIOLOGICAL PROTECTION LESSONS FROM FUKUSHIMA AND BEYOND

Hosted by Japan Atomic Energy Agency (JAEA), and in association with several Japanese, international, and other organisations, we brought the world together to discuss recovery after nuclear accidents. Timed around the release of ICRP Publication 146 on the same topic, most presentations can still be accessed by visiting www.ICRPreccovery.org

The Conference in Numbers

100+
COUNTRIES

2500+
DELEGATES

2000+
LIVE
ATTENDEES

148
PRESENTATIONS

12000+
WEB VIEWS

FINANCES

| | 2017 | 2018 | 2019 | 2020 |
|--------------------------------------|-----------|-----------|-----------|-----------|
| INCOMING RESOURCES | | | | |
| Contributions Received | 1 012 503 | 1 111 734 | 1 017 495 | 761 044 |
| Royalties | 184 722 | 229 585 | 124 153 | 189 793 |
| Other | 0 | 0 | 0 | 85 391 |
| Total Incoming Resources | 1 197 225 | 1 341 319 | 1 141 648 | 1 036 208 |
| RESOURCES EXPENDED | | | | |
| Promotion of Radiological Protection | 929 988 | 430 422 | 781 865 | 315 982 |
| Governance Costs | 477 652 | 509 784 | 494 158 | 438 986 |
| Other Resources Expended | 16 418 | (6 832) | 34 531 | 4 744 |
| Total Resources Expended | 1 424 058 | 933 374 | 1 310 554 | 759 712 |
| NET MOVEMENT IN RESOURCES | (266 833) | 407 945 | (168 906) | 277 268 |
| TOTAL FUNDS CARRIED FORWARD | 251 368 | 659 313 | 490 407 | 767 675 |

All figures in CAD

GLOBAL SUPPORTERS

The contributions from these organisations allow ICRP to further our programme of work, paving the way for the advancement of the system of radiological protection globally. Want to join this growing list of organisations at the forefront of radiological protection? **Contact us.**



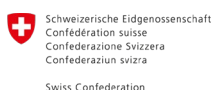
Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety



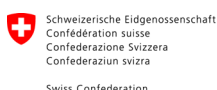
Innovative Solutions for Energy and Environment
JANUS
JAPAN NUS CO., LTD.



Santé Canada



Federal Department of Home Affairs FDHA
Federal Office of Public Health FOPH



Eidgenössisches Nuklearsicherheitsinspektorat ENSI
Inspection fédérale de la sécurité nucléaire IFSN
Ispettorato federale della sicurezza nucleare IFSN
Swiss Federal Nuclear Safety Inspectorate ENSI



Japan Radioisotope Association Danish Radiation Protection Authority (SIS)

ORGANISATIONS IN FORMAL RELATIONS

ICRP maintains formal relations with other organisations with an interest in radiological protection through specific agreements, or by granting Special Liaison status to organisations whose work is relevant to ICRP's mandate. Organisations currently in formal relations with ICRP are shown below.



EURAMED
European Alliance for Medical
Radiation Protection Research



**International
Labour
Organization**



ISRRT
INTERNATIONAL
SOCIETY OF
RADIOGRAPHERS
& RADIOLOGICAL
TECHNOLOGISTS



**National Council on Radiation
Protection and Measurements**



NEA
NUCLEAR ENERGY AGENCY



ICRP2021

1-4 NOV  VANCOUVER

**Come for the waves,
Stay for the mountains.
See you at ICRP2021.**



6th International Symposium on the
System of Radiological Protection

Brought to you by:



International Commission
on Radiological Protection



Canadian Nuclear
Safety Commission



Canadian Radiation
Protection Association



Health Canada