



# 5<sup>th</sup> European Regional IRPA Congress Evaluation Report

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## Introduction

From 4 – 8 June 2018 the 5<sup>th</sup> European Regional IRPA Congress ('IRPA2018') was held in the World Forum, The Hague, The Netherlands. In this report, we provide an overview of the process of organizing IRPA2018, the lessons learned and recommendations to IRPA and future organisers of IRPA congresses. We furthermore present the results of the surveys held among the congress participants. We finally present the financial result of IRPA2018 and recommendations to future IRPA congress organisers.

## History

Autumn 2013, during the European IRPA Presidents meeting in Paris, the Dutch Society for Radiation Protection (NVS) – along with various other European IRPA Societies – was invited to consider organizing the 5<sup>th</sup> European IRPA Congress. Late 2013 and early 2014, the NVS carried out a short feasibility study. The NVS concluded that organizing this congress would be possible, provided that adequate support could be obtained for composing the scientific program, especially the elements related to the nuclear field. An initiative to organise this congress together with our Belgian colleagues unfortunately failed. However, SRP granted support, which we gratefully accepted.

The NVS Board subsequently announced in spring 2014 its candidacy for hosting IRPA2018, however with the comment that it would withdraw its candidacy if any other European IRPA Society would apply. Main reason for this point of view was that we did neither want to spend the time of our valuable volunteers nor our money to an acquisition process with a (very) uncertain result. Finally – with only the NVS as a candidate – the Associate Societies (AS) Forum at the 4<sup>th</sup> European IRPA Congress welcomed the suggestion to have the next European IRPA congress hosted by the NVS. Formally, the approval of the European IRPA Societies only came at the European Presidents' Meeting in Amsterdam, October 2014.

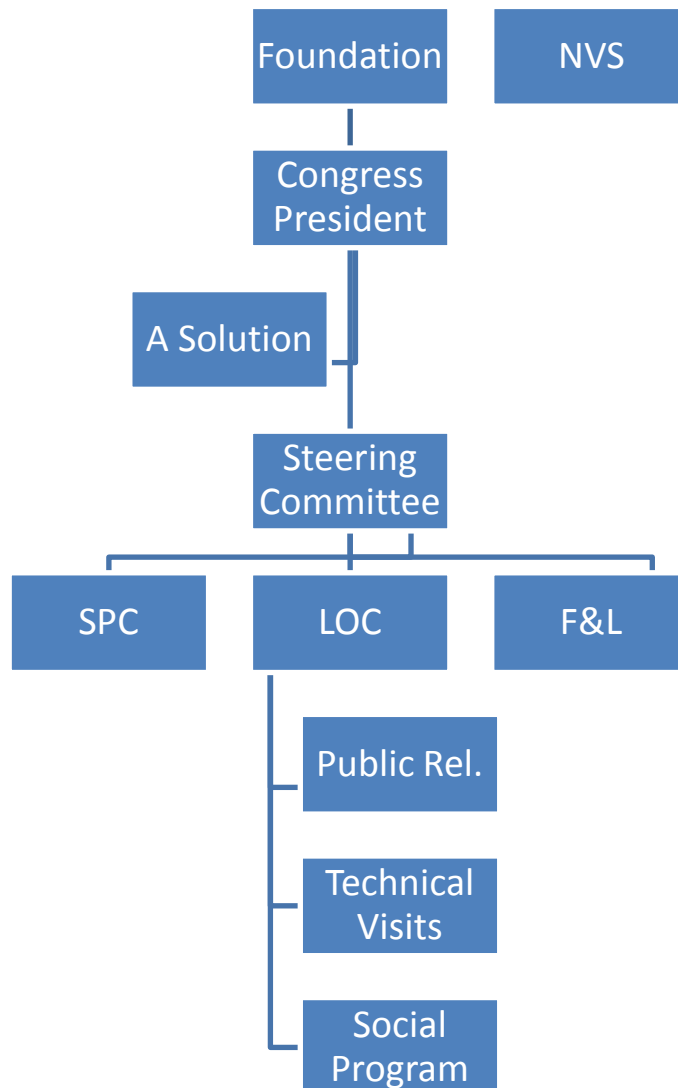
From the outset, it was clear that there was no procedure for determining the next location of regional IRPA congresses. It has become very clear during the IRPA2018 congress (with three candidates) that at least some kind of procedure is desirable to determine which Associate Society will be the next one to host a regional IRPA congress.

## Establishing the congress organisation

In order to prevent the NVS from being liable for financial losses resulting from the IRPA congress, it was desirable to establish a separate legal entity. We were happy to receive and accept an offer of the board members of the Foundation that organised the sub-regional IRPA congress in Utrecht in 2003 to take over their foundation ('Foundation Radiation Protection Symposium North-West Europe), including a small amount of seed money (k€ 3). After the formalities had been taken care of, the newly installed board invited *Lars Roobol* and *Jan Kops* to become the chair persons of the Scientific Program Committee (SPC) and the Local Organizing Committee (LOC) respectively. Together with the board of the Foundation they formed the steering committee, which was extended later on with *Ronald Smetsers* - vice-chairman of the SPC. Two board members formed the committee for financial and legal affairs (F&L).



In an early stage the Foundation decided to invite *A Solution* to act as the professional congress organiser. *A Solution* also keeps the member and financial administration office of the NVS and is well experienced in organising congresses. The schematic organisation diagram is given below.



At the same time the IRPA Executive Council and the Foundation established a Memorandum of Understanding describing the relation between the congress organiser and IRPA. Main goal of this document is to be transparent about mutual expectations and financial provisions. The final document was signed in June 2015.

### Choice of the venue and congress theme

One of the first duties of the Foundation was to select a suitable congress venue. Apart from the capability of the venue to provide enough rooms for parallel sessions, an auditorium for about 800 people and enough space for posters and exhibitors, it should also be located within roughly one hour of travel from Amsterdam Airport Schiphol. Knowing that security had gained increasing



interest over the past years, we finally selected the World Forum in The Hague - international city of justice and security. The vicinity of the beach resort of Scheveningen (only 2 km from the venue) should also contribute to its attractiveness. The agreement between the Foundation and the World Forum was signed in November 2015.

In an early stage it was proposed to include `sustainability` in the central theme of the congress. Keeping in mind the necessity to sustain the (radiation protection) work force on one hand, and to use scarce financial means to promote optimisation in radiation protection in the broadest sense, this choice seemed fully justified. At the steering committee meeting in March 2015 the theme 'Encouraging Sustainability in Radiation Protection' was chosen from three alternatives. Shortly after this decision the United Nations published their 17 goals for sustainable development. Our choice of the central theme as well as the key characteristics (see below) could not have been more appropriate.

## Key aspects of the Program

Meetings of the steering committee in the first months of 2015 were also used to establish the LOC and the (core) SPC. For both committees members from the NVS were invited. Apart from that, the SRP was invited to nominate two or three members of the core SPC in order to strengthen the representation from the nuclear field. In June 2015 we held a first plenary 'kick-off' meeting of the SPC and LOC in Leiden. In this half day meeting all ideas about the scientific program including the central theme as well as the social program were collected. A preliminary time path was proposed and further arrangements were made. An overview of the members of the committees is given in Appendix A.

Based on the input of the SPC and LOC and keeping in mind the preliminary congress theme, the main characteristics of the congress were determined:

1. a strong focus on (activities for) the Young Generations
2. a strong focus on educational aspects and continuous job development
3. in case of competing financial interests, the scientific parts of the congress prevail (*e.g.* no fee for refreshers is favourable above providing free lunches)
4. the use of up-to-date technical possibilities (congress app, digital poster screens, registering attendance)
5. the organisation of side events would be promoted by offering free rooms in the congress venue

Based on recommendations from the previous regional IRPA congress in Geneva we decided to restrict our efforts to get sponsors of the program to the main players in the field (like IRPA, ICRP, WHO, IAEA and the EC). The time / effort necessary to get more organisations involved, was considered to not be in relation to the possible positive effects on the ultimate program.



## Fixing the figures and deadlines

In 2015 the first draft budget was made. In order to cover the first financial obligations, the board received seed money from the Foundation Utrecht 2003 (k€ 3), the organisation of the IRPA2014 congress in Geneva (k€ 10) and of the NVS (k€ 25). It has to be noted that the seed money from IRPA2014 originated from the positive result of the IRPA2010 regional European congress in Helsinki.

In 2016 the various figures and deadlines were fixed, the final budget being established early 2017.

With respect to the expected number of participants and the applicable registration fees, we refer to the next paragraph.

The only other relevant fees were determined to be € 30 for the congress dinner (a low threshold to prevent no-shows and therefore food spill), € 40 for the Technical Visits (covering only transport, lunch box included) and € 50 for partners. The final budget did not allow for providing free lunches to the participants.

The deadline for abstract submission was chosen to be November 1<sup>st</sup>, 2017, knowing that it would be necessary to extend this deadline. This eventually happened twice. February 1<sup>st</sup>, 2018 was used as the final deadline. Even after the deadline, the scientific Program committee welcomed contributions until March, albeit that they were only considered for acceptance as a poster.

Shortly after the final budget was approved by the board, registration for the congress opened (around April 1<sup>st</sup>, 2017). Virtually parallel to the opening of the congress registration, the system for abstract submission - after a short testing period - opened.

## Participants

### Acquisition and expectations

Of course, it is a major challenge to attract as many radiation protection professionals as possible to a congress like this. A first announcement of the congress was printed and issued in April 2016. The second announcement including the call for abstracts was issued early 2017. From that moment on the organisation also produced newsletters with updates on the congress program. The most important communication partners were the European AS, through which we distributed announcements and newsletters from 2016 onwards. Furthermore, various important congresses were visited where the The Hague congress was promoted (a.o. IRPA14 in Cape Town - 2016, ETRAP-conference in Valencia - 2017, ICRP-symposium in Paris - 2017) by submitting a poster. We gratefully acknowledge the organisers of the IRPA14 congress for offering our organisation a free booth in the exhibition hall. Finally many AS members from the Netherlands and abroad volunteered to distribute the announcements of the congress at (inter)national meetings.

In the planning phase of the congress, we considered it to be wise to stick to the same number of participants as present at the 4<sup>th</sup> European IRPA congress, *i.e.* about 600. The budget took into account the following distribution of the registrants.





	<i>Deadline</i>	<i>Number</i>	<i>Fee</i>
Very early bird	September 1 <sup>st</sup> , 2017	80	€ 630
Early bird	February 1 <sup>st</sup> , 2018	260	€ 730
Normal	May 1 <sup>st</sup> , 2018	156	€ 880
Last minute + onsite fee	June 8 <sup>th</sup> , 2018	52	€ 1,040
Waived fees	n.a.	52	€ 0
<b>Total number of participants</b>		<b>600</b>	

A reduced fee for students and young professionals was realised for a maximum of 75 participants (€ 475). For budgetary reasons, the very early bird registration was therefore maximised at 60 instead of 80 registrants. An eventual deficit in the budget due to € 475 fee was covered by IRPA for roughly € 5,000 maximum. For practical reasons, the early bird fee also applied to anyone whose contribution was submitted before the final deadline (February 1<sup>st</sup>, 2018) for abstract submission, provided it was accepted.

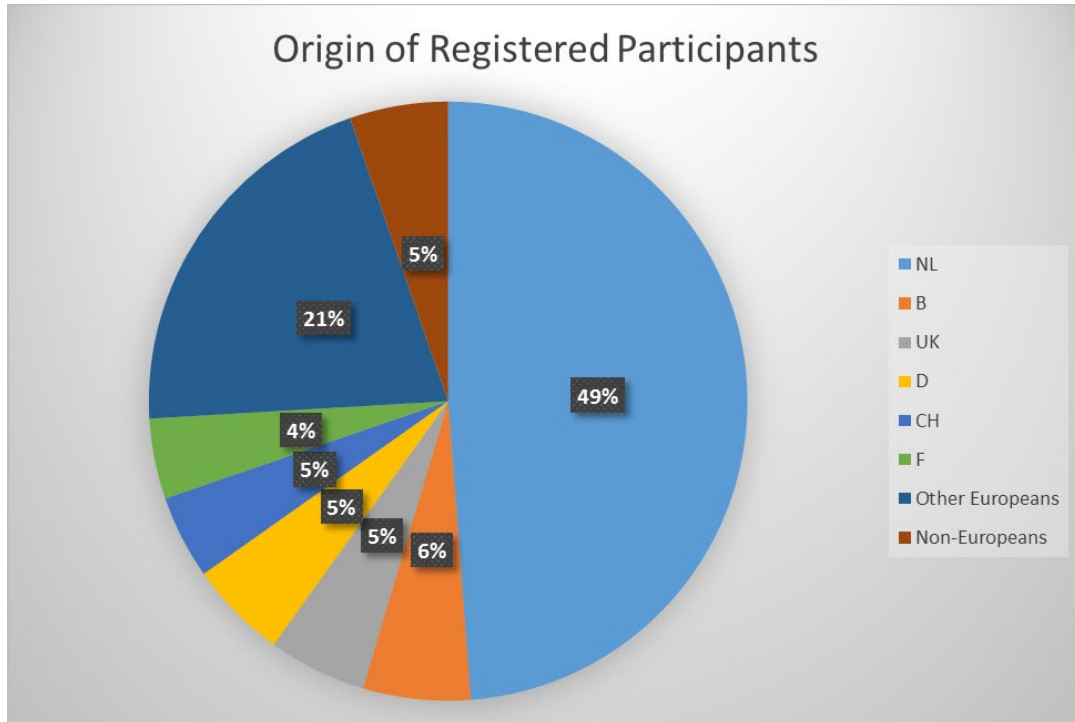
### Actual registrations

At the end of the congress, we concluded that the initial estimate had been very accurate. With a total number of 621 registrants, the expectations were met. Furthermore, every company or organisation present at the exhibition was invited to bring two participants to the venue. Below we give a short distribution of the registrants. Most remarkable fact was the large number of registrants that paid the early bird fee. This is caused by the fact that all authors whose abstract was submitted before the early bird deadline got to opportunity to register for the early bird fee upon acceptance of their abstract.

<i>Category</i>	<i>Number of participants</i>
Regular Registrants – very early bird	58
Regular Registrants – early bird	253
Regular Registrants – normal	104
Regular Registrants – late and on site	55
Young Professionals and Students	71
One Day Registrants	16
Registered Partners	16
Other Registrants (waived fee)	48
<b>Total number of registrants</b>	<b>621</b>
Other participants (estimated): exhibitors	46
<b>Total number of participants</b>	<b>667</b>



Just below 50% of the registrants came from the Netherlands. Neighbouring countries were represented by roughly 5% each, whereas also 5% of the registered participants originated from outside Europe (see Figure below).



## Scientific Contributions

### Keynotes

Invited speakers gave a total number of 16 keynotes in four sessions, one on every congress day except Wednesday. Among the invited speakers were representatives of the international organisations that supported the congress: IRPA, ICRP, WHO, IAEA, ICNIRP and the European Commission. The time slot for keynotes was 30 minutes.



## Submitted Contributions

A total of 331 contributions were submitted through the abstract submission system. The authors had to choose between submission as a poster, as a poster plus presentation (poster pitch) or as an oral presentation. In principle, contributions were each reviewed by three members of the extended SPC. Due to late submission, a few contributions were reviewed by one or two members of the extended SPC only. The SPC in the end rejected no abstracts. A summary of the submissions is given in the table below.

Category	Submitted contributions	Granted contributions
Oral presentation	152	126
Poster + presentation	52	41
Poster	127	164
<b>Total</b>	<b>331</b>	<b>331</b>

On submission of a contribution the authors also had to indicate the area and sub-specialty of his or her contribution. As main areas the SPC identified:

1. Fundamental and/or general issues
2. Medical
3. Industry
4. Research and applications
5. Non-ionising radiation

For each area over 10 sub-specialties were available. The areas and sub-specialties are given in Appendix C

Based on the abstract submissions and the indicated areas and sub-specialties, the core SPC determined the final topics of the sessions.

## Parallel Sessions

The oral contributions were divided among 3 to 5 parallel sessions, taking into account that related subjects were not presented at the same time. The total number of parallel sessions was 30. The subjects of the sessions are given in the second paragraph of Appendix C. The time slot for oral presentations was 20 minutes (including 3 minutes Q&A and 2 minutes for changing rooms).

## Poster Sessions

The poster sessions (14 in total, two parallel sessions) were held near digital screens in the poster hall. The sessions focused on the poster pitches with a time slot of 5 minutes each. The subjects of the poster sessions are also given in Appendix C.

A total number of 205 posters was expected at the congress. In order to warrant uniformity in the poster presentation and to prevent empty spaces in the poster hall, all authors were obliged to



upload their poster roughly 2 weeks before the congress. The congress organiser took care for printing and mounting the posters. All posters, uploaded until a few days before the congress, were printed. In the end roughly 75% of all granted poster (and poster + pitch) contributions were uploaded in time. Only a very few posters were included in the poster hall afterwards at some dedicated walls.

We concluded that the process of uploading posters before the congress does not lead to serious problems whereas no empty poster walls appeared. Although all posters on the same subject were mounted next to each other, we missed the notification of the subjects near the posters. Taking this improvement into account we recommend next organisers to use our system of uploading and printing of posters. Also, participants did not always recognise the poster (pitch) sessions as true poster sessions. We therefore recommend future organisers to make this more explicit in the congress program.

### Refresher courses

From the outset the steering committee decided to give a prominent place to refreshers in the program of the congress. Starting points for these refreshers were:

- accessibility without requiring to pay an additional fee
- dedicated sessions of refreshers, allowing two or three refreshers on a specific topic (e.g. a basic refresher, followed by either a more in-depth refresher or by a refresher presenting actual developments in the field)
- combining Technical Visits whenever suitable or possible with one or more refresher courses
- learning outcomes and recommended reading for every refresher, thus meeting the minimum requirements for acknowledgement of the refreshers as being part of continuous professional development (in the Netherlands).

Refreshers made up the program for Monday and Wednesday morning, with three (in one case four) parallel sessions. Both mornings, participants could attend three refreshers. The time slot for a refresher was 60 minutes, followed by a 15 minute break. Upon entry and departure of a refresher, each participant was registered by scanning the congress badge in order to be able to demonstrate his or her attendance.

In Appendix D the main topics, lecturers and number of granted certificates of the refreshers are given. The average number of participants per refresher was 63, whereas the average participant attended three refresher courses. The average attendance at an arbitrary moment during the refresher sessions was approximately 285, whereas the maximum was reached on Monday morning (335 at the second session).

The learning outcomes and reading material will remain available on the website of the congress for a longer period of time.



## Scientific side events

Starting in 2015 the steering committee has invited its contacts to organise side events as part of the IRPA2018 congress. This led to a number of both scientific and non-scientific sessions that will be addressed here and in the next chapter.

### EUTERP – workshop

On Wednesday afternoon a workshop organised by the European foundation for Training and Education in Radiation Protection (EUTERP) attracted about 80 participants. The workshop focused on two topics, introduced by contributions of *Joanne Stewart* and *Michèle Coeck*, board members of EUTERP:

- Training of Radiation Workers
- Evaluating the Impact of Training Programs

The afternoon provided enough input for the next EUTERP workshop, to be held at Malta in April 2019.

### European NORM Association and IAEA Environet NORM project

Observing that professionals involved in radiation protection related to NORM have a variety of networks that meet on a regular basis, we took the initiative to organize a combined meeting of these networks in order to avoid unnecessary efforts. The European NORM Association (ENA) was established in 2017 merging the European ALARA Network – NORM and the EU-NORM symposia, with more or less the same objective. We were therefore happy to have various sessions organized by members of ENA and the IAEA Environet NORM project. The NORM-related sessions in appendix C give proof of the success of the NORM program in The Hague.

### Young Professional Award Sessions

Since 2010 regional and international IRPA congresses have been extended with awarding one or more Young Scientists or Professionals with the so-called Young Professional Award (YPA). This YPA has been established to encourage the young generation to get involved in radiation protection and to facilitate them to participate in international congresses. In the past decade, this has led to a series of successful YPA competitions. There has been an ongoing debate on the question whether the presentations of the Young Professionals should be part of the regular scientific program, or should be concentrated into dedicated sessions.

The steering committee decided – after consultation of various stake holders – to try a somewhat different approach: there would be a dedicated YPA session, but all participants would also be invited to submit their abstract for the regular Scientific Program. The SPC judged their contributions in exactly the same way as they did with all other submitted contributions - thus creating uniform level of quality of the contributions in the regular scientific sessions. As a consequence, a few competitors for the YPA gave their presentation twice during the congress. Furthermore, taking into account the importance that the steering committee granted the young generation, no parallel sessions were organised during the YPA sessions.

The two YPA sessions were held on Thursday afternoon. Eleven representatives of European IRPA AS competed (one per society). The competitors were judged by the YPA Jury, consisting of twelve



members from seven AS, chaired by Alfred Hefner (IRPA Executive Council). During the establishment of the YP jury, the AS had been invited to nominate two members to the jury, one experienced member and a second, younger member. Criteria for the judgement of the young professionals were the relevance of the work for radiation protection, its scientific quality, the creativity of the work and the presentation by the young professionals. All criteria were considered to be equally important. Each associate society represented in the YPA jury only had one vote.

There was a clear winner of the YPA. During the closing ceremony, the YPA was presented to ms. *Nadia Benabdallah*, representing the French AS. She presented her work on the 'Contribution of micro- and macro dosimetry in alpha therapy'.

Apart from the YPA, the organisation decided to award two young professionals with a young professional audience prize. Every congress participant could – by means of the congress app – vote for one candidate in the YPA competition. Based on 85 votes the YP audience prizes were presented to ms. *Benabdallah* (see above) and ms. *Marion Piepenbrock*. Ms. Piepenbrock represented the German AS and received the prize for her work on 'Development of a badge for the simultaneous measurement of the personal dose equivalent  $H_p(10)$  and  $H_p(0.07)$  with TL-DOS'.

Although the exact number of attendees of the YPA sessions is not known, the total number is estimated to be about 200. Considering the beautiful weather during the congress this is considered to be a reasonable number.

### IRPA Workshop on Public Understanding of Radiation Risk

In an early stage of the congress, the steering committee tried to co-host the RICOMET 2018 congress on Social Sciences and Humanities in Ionising Radiation Research. Unfortunately this turned out not to be feasible. As part of this congress, the Belgian AS organised with IRPA a Workshop on Public Understanding of Radiation Risk. This subject was considered to be very important for participants of the IRPA2018 congress as well. We were therefore very happy to host a 'pre-congress' workshop together IRPA on this subject.

The workshop was held on Friday morning and was attended by about 65 participants. Three introductory contributions were given by *Tanja Perko* (SCK-CEN), *Pete Bryant* and *Pete Cole* (both on behalf of SRP).

### NRG Lunch Seminar

As part of the exhibition program, exhibitors were invited to host lunch seminars. Tuesday, the Nuclear Research and consultancy Group (NRG) organised a lunch seminar, presenting an overview of the scientific work by NRG. The two contributions were given by *Geert-Jan de Haas* and *Govert de With*. About 100 participants attended this seminar.

### Scientific summary

Immediately preceding the closing ceremony IRPA President *Roger Coates* summarised the congress on the basis of input by the session chairs. Under the leadership of *Lars Roobol*, this contribution has been transferred into a scientific summary of the congress that has been included in this document (Appendix E).



## Non Scientific Program

### Opening and Closing Ceremony

Both the opening and closing ceremony, with in total nine contributions, were held compact in order to give as much space to the scientific program as possible. The opening session consisted of contributions from *Hielke Freerk Boersma* (congress president), *Carolien Leijen* (NVS president), *Jan van den Heuvel*, (director of the Dutch Authority for Nuclear Safety and Radiation Protection - ANVS), *Roger Coates* (IRPA president) and from prof. *Pim van Gool*, (president of the Dutch Health Council), who formally opened the congress. The closing ceremony focused on the awarding of the Young Professionals and the announcement of the location of the next European IRPA congress. The closing ceremony ended with words of farewell by the congress president.

### Technical Visits

In an early stage the steering committee decided to create an extensive offer of locations for Technical Visits (TVs). By the end of 2016 twelve potential locations for TVs had been identified by the Local Organizing Committee. These locations would provide every participant the opportunity to pick out his or her 'cherry'. Institutes and organisations from the nuclear and conventional industry, medical field and research were represented. Also topics like decommissioning, radioactive waste, non-ionising radiation and exposures in space were included in the TV program.

In the 2016-2017 season all TV locations were pre-visited by two members of the LOC, discussing preconditions for the visit, along with the possibility of combining the visit with a refresher course. It was decided that the fee for every TV would be € 40, covering mainly the travel expenses. In appendix F, the scheduled TVs are shortly characterised.

The TVs were scheduled for the Wednesday. In our communication we stressed the fact that full day excursions could not be combined with taking refreshers courses at the congress venue with one exception: TV7 was conducted twice. The second TV7 was specifically meant for radiation physicians who, after attending the refresher courses at the World Forum in the morning, left for their TV and returned only late in the evening.

At the opening of registration for the congress it had already been decided to combine TV3 and TV6 into a one-day TV. It soon turned out that some TVs were very popular, while others stayed far behind. Although this was not unexpected, it implied that a about five weeks before the congress one-third of the scheduled TVs had to be cancelled due to not exceeding the lower threshold as indicated by the hosting organisation. A few weeks before the congress the final number of TVs was fixed to four, cancelling another third of the TVs. All registrants for TVs that were cancelled, were offered the opportunity to register for another TV or to get a refund of the TV participations fee.



Below an overview of the executed TVs is given.

Technical Visit	Destination	# Attendees
TV2	European Space Agency - Noordwijk	59
TV3 & TV6	NORM Depository – Maasvlakte & COVRA Waste Management - Vlissingen	22
TV4	Customs Rotterdam Harbour – Rotterdam	43
TV7 - I	SCK-CEN – Mol (Belgium)	21
TV7 – II	SCK-CEN – Mol (Belgium); for Radiation Physicians only	17
<b>Total</b>		<b>162</b>

The total number of participants to the TVs was 162, *i.e.* 28% of the registrants (excluding partners and one-day registrants) attended a TV. This number is considered to be very satisfying. No shows were not reported. The relatively high number of participants might also be attributed to the fact that they organised half-way the congress, although this statement cannot be supported by the results of the surveys.

Looking back to the development of the program of TVs we concluded that it had been a very time consuming process that not fully paid off. Furthermore, the LOC strongly (and successfully) cooperated with the SPC because of the preparation for the refresher courses. From an organisational point of view we therefore recommend future organisers

1. To restrict the number of potential locations for TVs to three to five.
2. To continue the combination of refresher courses with TVs

### IRPA Associate Societies Forum

Every regional IRPA congress is accompanied by an IRPA AS Forum under auspices of the IRPA Executive Council. The IRPA AS Forum in The Hague was held on Monday Morning, immediately preceding the opening ceremony. Most of the European IRPA AS were represented at the Forum, estimated to have been attended by more than 50 participants. It is not known to what extent the attendance has been influenced by the refresher courses that were given parallel to the World Forum.

### School Event

The NVS decided in early stage to use IRPA2018 as the start of an outreach program for secondary school students. The steering committee could offer the NVS the venue for free. A separate working group, primarily existing of NVS-members prepared an interesting program consisting of three theoretical presentations along with an extended exhibition where students could do small experiments. The three presentations were given by *Klazien Huitema, Thorsten Hackl* and *Ralph Meulenbroeks*.

A total of 150 students from secondary schools in the The Hague region visited the event. This first School Event was seen – both by the students and the exhibitors – as a great success. Based on the evaluation, the NVS will decide about future outreach activities.





## Exhibition

For participants in an IRPA congress the presence of exhibitors is undoubtedly of great importance. It gives the radiation protection professional an up-to-date view on measuring devices, software, consultancy and many other things relevant for radiation protection. For the treasurer of a congress, the fee paid by the exhibitors is a crucial contribution to its financial success.

The steering committee developed four different package deals for potential exhibitors / sponsors. They could opt for  $\alpha$ -,  $\beta$ -,  $\gamma$ - or X-sponsorships, ranging from k€ 18 to k€ 5 each. Apart from these package deals, exhibitors with deviating wishes were invited to contact the congress organisation. Over 400 possible exhibitors were approached in several ways (direct mailing, direct calls, and personal contact). In the planning phase of the congress, we expected a total of 18 exhibitors. As the interest remained very restricted in the first period, the steering committee had to cut into the budget by removing several nice-to-have items. At the same time, acquisition was intensified especially by increasing direct contacts with the potential sponsors. This extra investment in support by the congress organiser, fortunately paid off. Ultimately we ended up with 23 exhibitors, 21 as X- and 2 as  $\gamma$ -exhibitor (Mirion Technology and NRG). Although the number of exhibitors finally exceeded expectations, the income was much less than expected as the more expensive package deals were not chosen at all.

The exhibitors were located in the poster hall and the hall towards the main auditorium and other lecture rooms. For the booths a fixed interior was provided, wearing the exhibitor's logo. After the congress these interiors could be taken by the exhibitor. During the breaks, coffee and tea was provided at various locations very close to the exhibition halls. In general, we received positive reactions from the exhibitors, especially with respect to the interior of the booths. However, most exhibitors indicated that a five day presence at a congress like this, was too long, specifically, because they were contractually forced to stay until the end of the congress. We therefore recommend future organisers to restrict the exhibition to three days. Besides, the presence of congress participants during Wednesday afternoon was minimal as many were participating in a TV. In this respect it would be wise to plan a potential TV program not on Wednesday.

## Social Program

The social program of the congress consisted of three elements: a welcome reception on Monday Evening, early morning jogging tours on Tuesday, Wednesday and Thursday Morning, and the congress dinner on Thursday Evening. The welcome reception and jogging tours were accessible without additional fee. The fee for participating in the congress dinner was kept low (€ 30) in order to encourage participants to join this dinner. The financial threshold for participation was introduced to minimise 'no-shows' and subsequent food spill.

The welcome reception was held in the cafeteria of the congress venue and was financially sponsored by the city of The Hague (with k€ 20). A short speech was given by the chair of the local organizing committee, Jan Kops, who also opened the art exhibition at this occasion (see below). An estimated number of about 200 participants attended the welcome reception.



The morning jogging tours through The Hague and the nearby beach resort Scheveningen were attended by twenty people on the first day, decreasing to about five on the last morning. Starting at roughly 6:45 AM is obviously too early for many RP professionals.

The congress dinner, held in the nicely decorated basement of the congress venue, was attended by roughly 300 participants. There were virtually no 'no-shows'. During the dinner short speeches were given by *Jan Kops* and *Roger Coates*. The dinner ended with a 'walking' dessert, creating a beautiful transition to the afterparty accompanied by a great band.

### Art Exhibition

The steering committee invited artist and former medical physicist *Arie van 't Riet* to set up an art exhibition in the foyer of the Congress Venue. Using X-rays, *Arie van 't Riet* creates beautiful art works of plants and animals that have gained wide recognition. The exhibition consisted of about twenty different works. Interested participants were offered the opportunity to purchase the works.

Together with a few members of the LOC, *Arie van 't Riet* created a special piece of art for the IRPA2018 congress, which was consecutively reproduced and given as a token of appreciation to the invited speakers and others. Another special art work was created and awarded to the winners of the YPA and the YP audience prize.

### Other events

The LOC also prepared a 48-hour Post congress tour, immediately following the congress. Its destination would be the city of Leeuwarden and the surrounding province of Friesland. As the European Capital of Europe, Leeuwarden/Friesland offered a series of artistic and musical highlights that we considered to be very interesting for congress participants. Unfortunately the minimum number of participants (6) was not reached by the end of the deadline and we therefore had to cancel this event.

On Tuesday evening the Boards of the Belgian and Dutch AS met in an informal meeting to discuss future possibilities for collaboration.

### Evaluation: Results from the surveys

A total of 91% of the participants installed and used the specially developed IRPA2018 congress app (primarily for determining their personal congress program and reading presentations). This made it a perfect tool for distributing surveys among the participants. Based on whether participants entered their intention to attend refreshers or keynotes in their app-agenda, they received a compelling request for completing a survey immediately after the refresher or keynote. On a more 'voluntary' basis all participants were invited to complete a survey on the more general aspects of the congress.

The difference in number of responses is an immediate consequence of the degree of voluntarism associated with the surveys (but maybe also of the size of the survey):



Item	Number of responses
Keynotes	691
Refreshers	647
General aspects	39

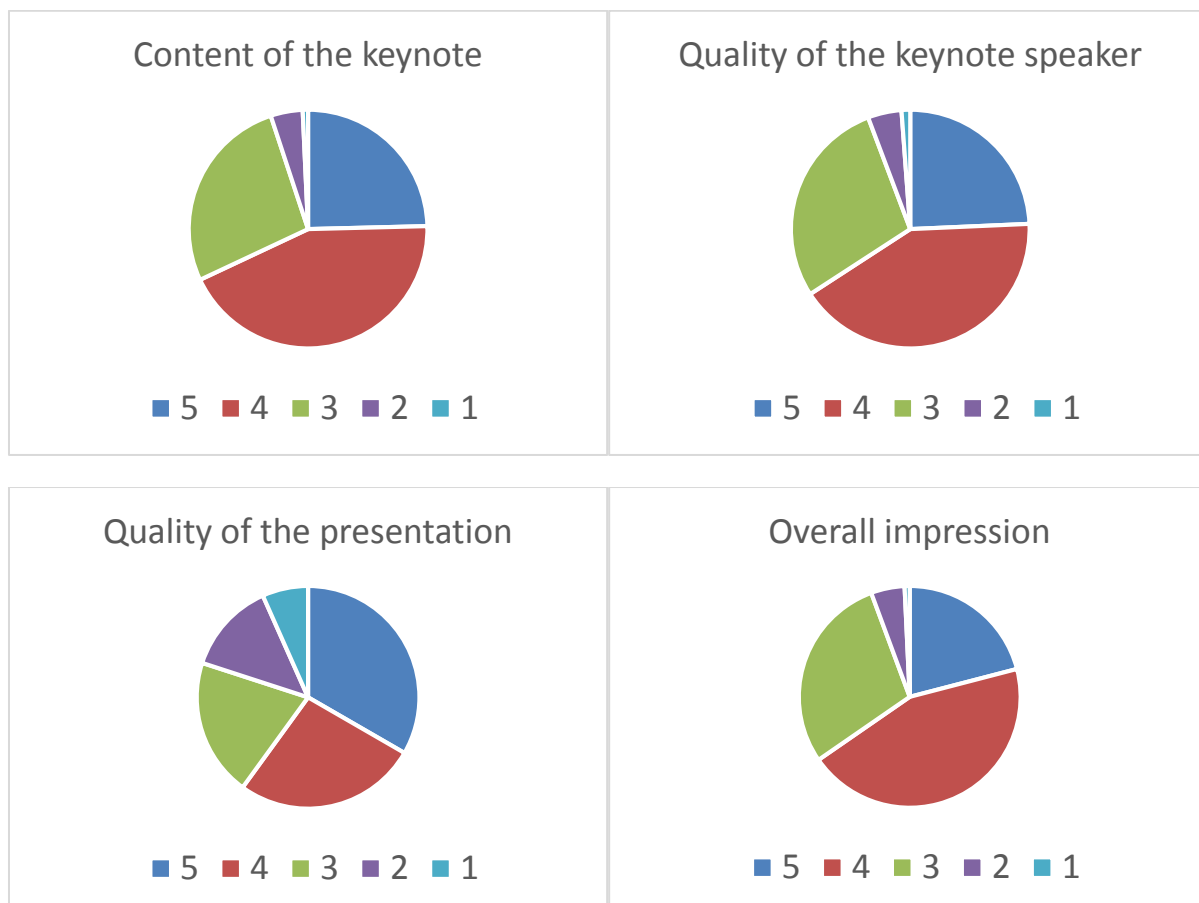
Most questions in the survey asked participants to rate a certain aspect on a scale from 1 (unsatisfactory) to 5 (excellent), with 3 being 'average'. The surveys of refreshers and keynotes were restricted to four questions each. The general survey required participants to pay attention to many aspects of the congress. Below we will give all results of the survey

## Keynotes

The four dedicated question of the survey on the keynotes gave the following result:

Question	Rated (on scale 1 – 5)
Content of keynote	3.9
Quality of speaker	3.8
Quality of presentation	3.8
Overall impression	3.8

The distribution of the answers is provided below:





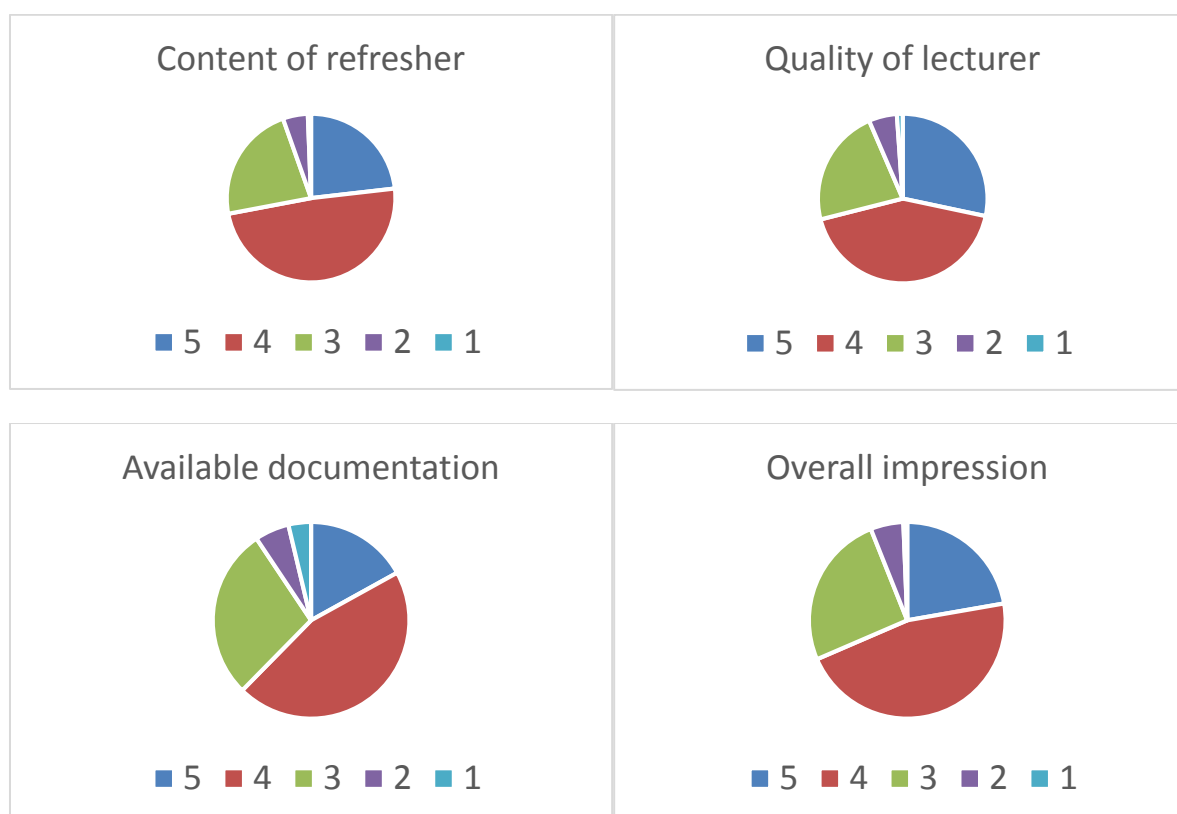
From the general survey, a couple of questions also dealt with the keynotes:

Question	Rated (on scale 1 – 5)
Organisation of keynotes	4.2
Topics	3.9
Did keynotes meet your expectations?	87%: yes; 13%: no

## Refreshers

For the refreshers we also provide the four questions, their rating and the distribution of the ratings:

Question	Rated (on scale 1 – 5)
Content of refreshers	3.9
Quality of lecturer	3.8
Quality of documentation	3.7
Overall impression	3.8



From the general survey the following ratings originate:

Question	Rated (on scale 1 – 5)
Organisation of refreshers	4.3
Topics	4.1
Set-up of refreshers	4.0



It is worthwhile noting that no refresher received an overall rating lower than 3.4 - still significantly above average - while the marks went up to 4.7- virtually excellent - for some of the lecturers.

## General Aspects

The general aspects of the congress have been clustered into topics, two of them being the keynotes and the refreshers which were reported above. Below the results of the survey on the other topics are given. Apart from the questions and their rating, also the number of responses is given, as this is sometimes significantly lower than 39.

Topic	Question	Rated (on scale 1 – 5)	# Responses
Scientific Sessions	Organisation	4.1	39
	Topics	4.1	39
	Rooms	3.5	39
	Did sessions meet your expectations?	95%: yes, 5%: no	39
Technical Visits	Organisation	4.2	16
	Transport	4.5	13
	Refreshers @TV	3.7	6
	Did TV meet your expectations?	100%: yes	12
	Overall impression	4.8	12
Young Professional	YPA Sessions	4.1	27
	Set-up: one session	4.0	27
	IRPA YGN Launch	3.6	16
Exhibition	Exhibition	3.7	31
	Area	3.7	31
Social Program	Welcome reception	3.7	26
	Congress Dinner	4.0	27
Other aspects	Venue	3.9	34
	Catering	2.5	34
	Congress app	3.9	34
	Satisfied with congress fee?	77%: yes; 23%: no	22
Summary	Congress organisation	4.1	34
	Overall impression	3.9	34
	Satisfied with congress?	87%: yes, 13%: no	23

## Summary of survey

It is clear that virtually all aspects of the congress are rated around 4 ('good'), a result for which we owe a lot of thanks to all the volunteers and participants that contributed to the congress.

Unfortunately there was one clear exception: the catering. According to the comments made by the individual responders this had to do with two aspects: the fact that no free lunches were provided, and – maybe even more important – the fact that the venue very strictly dealt with the time schedule of the coffee breaks. The first reason was expected: in determining the budget, the organisation



decided not to require a fee for the refreshers at the expense of free lunches. The conduct of the venue with respect to the coffee / tea breaks was however not expected (although a full time availability of coffee / tea was not foreseen due the unrealistic high costs charged by the venue).

Our experience leads to the rather straightforward recommendation to future organisers to provide – if the budget allows – to provide coffee and tea all day, and preferably free lunches.

## Financial accountability

The final budget was approved in March 2017, based on the attendance of 600 participants. Additionally, the organisation received an amount of k€ 38 seed money that has been kept out of the budget. Already in 2015 it was clear that this seed money would not satisfy the financial obligations of the first two years of the congress organisation. We were happy with the approval of the general assembly of the NVS to grant us a loan of k€ 25 that has been refunded as soon as the revenue offered us the opportunity to do so.

In the next table we summarise the financial budget and realisation as at 31 December 2018.

<b>Account IRPA 2018 The Hague (31 December 2018)</b>		
	<b>BUDGET (k€)</b>	<b>ACCOUNT (k€)</b>
	<b>Total excl. VAT</b>	<b>Total excl. VAT</b>
Congress Bureau <i>A Solution</i>	85	95
Committees	20	7
Promotion	8	13
Materials	8	2
Invited Speakers & Guests	40	12
Venue	277	310
Exhibitors	23	26
Social Program	54	8
Remainder	115	9
Value Added Taxes	40	29
<b>TOTAL COSTS</b>	<b>670</b>	<b>512</b>
Congress Fees	432	423
Promotion	28	18
Exhibitors and subsidies	229	134
<b>TOTAL INCOME</b>	<b>689</b>	<b>575</b>
<b>BALANCE</b>	<b>20</b>	<b>63</b>



Basically, all items in the budget correspond to actual expenditures and revenues. Most important deviations on the expenditure side were seen at the remaining costs, the social program and the expenses for invited speakers. As described above, in the beginning subscriptions of participants and exhibitors were far below expectations, and various budgeted nice-to-have items (e.g. more digital poster screens, free public transport cards) had to be cut. The nice-to-have items were budget wise mainly accommodated with the item remainder. When later on it became clear that both the number of anticipated of participants would be achieved, it was too late to squeeze in most of the items already removed from the budget. The expenses for the social program were largely determined by the congress dinner, which was initially foreseen at another location. As the dinner was ultimately held at the congress venue, it has been included in the corresponding item leading to an overspending for the item venue. The travel costs for invited speakers were much lower than expected due to the restricted but still adequate reimbursement for European guests. On the income side not only the exhibitors' contributions, but also subsidies were significantly lower than expected, thereby giving rise to the budget cuts taken.

Noting that the congress organisation received in total about k€ 38 seed money: from the Utrecht 2003 foundation (k€ 3), the NVS (k€ 25, already returned) and the previous European IRPA congresses (k€ 10), the end-year balance of the bank account is around k€ 75. According to the Memorandum of Understanding, all seed money will be returned. Therefore k€ 10 will be transferred to the organisers of the 6<sup>th</sup> European IRPA congress. The Foundation The Hague will extend the seed money it received from Utrecht 2003 to k€ 5 in order to be able to pay current commitments and initial costs of any forthcoming activities.

Roughly k€ 10 will be reserved for expenses necessary to make the full papers, posters and abstracts available for a long time. Consequently, the projected final balance of the IRPA congress will be about k€ 53. From this positive result, 20%, with a maximum of k€ 10 will additionally be transferred to the organisation of the 6<sup>th</sup> European IRPA congress in Budapest. About k€ 40-45 will be handed over to the NVS with the obligation to spend it to the benefit of radiation protection. The steering committee will advise the NVS board on spending items (e.g. young generation goals, Free-the-Annals initiative) of this fund. Whether the Foundation The Hague 2018 will be maintained or discontinued, will be decided at a later time.

## Recommendations and conclusions

Based on our experiences in organizing the 5<sup>th</sup> European regional IRPA congress and the surveys we conducted, we conclude with the following recommendations that might be used by future organisers of regional or international IRPA congresses.

- To continue a set-up of refreshers where dedicated parts of the congress (one day or two half days) are devoted to refresher courses exclusively, with the possibility of treating topics on two different levels. Furthermore to provide well before the start of the congress, learning outcomes and recommended reading for each refresher.
- To consider maintaining dedicated sessions for the YPA in the congress. Note however that facilitating the jury should not be the reason for doing so, but rather the warranty of a



uniform quality at the regular scientific sessions. It is therefore recommended to have the YPA contributions judged for acceptance for an oral or poster presentation by the SPC also.

- To have a system in place for uploading and printing of posters by the congress organiser. Taking this improvement into account we recommend next organisers to use our system of uploading and printing of posters.
- In view of the ongoing digital communication to have a dedicated congress app available. We recommend next organisers to use and/or improve our congress app.
- To continue and extend the possibility for certain poster presenters to give a short presentation (typically 5 minutes – a ‘poster pitch’). We recommend that in future congresses it should be explicitly clarified that these poster pitches are part of regular poster sessions. The option for full digital poster sessions may be explored.
- To restrict the number of potential locations for technical visits to three to five, where the option of combining a technical visit with refresher courses should be explored.
- To restrict the exhibition to three days. One should however keep in mind that an easy choice to implement this recommendation - to have technical visits at the beginning or especially at the end of the congress - might have a major drawback: a significant lower participation degree is lurking.
- To develop a template for the organisation of the scientific part of IRPA congresses to warrant uniformity in the regional and international IRPA congresses.
- To have guidelines available for determining the next location for regional IRPA congresses.
- To provide free coffee and lunches during the congress whenever the budget allows to do so.

With the organisation of the 5<sup>th</sup> regional European IRPA Congress in The Hague, we believe to have proved the strong commitment of the NVS to the international radiation protection community. We have witnessed a good congress that hopefully served as an event that inspired many young and experienced radiation protection professionals to exchange their knowledge and views, contributed significantly to the development of continuous job development and finally offered all the possibility to meet old friends and make new ones. We are confident that the lessons learned by us, and the recommendations formulated above, will be considered by the IRPA Executive Council and by organisers of future IRPA Congresses. Finally, we would like to wish the next organisers of IRPA congresses all the best in their preparations.

### Acknowledgement

I would like to thank Gert Jonkers for critically reading the manuscript.

January 25, 2019





## Appendix A – Committee Members

### Steering committee

Anita Buiteman (congress organiser)  
Bert Gerritsen (secretary) – Secretary Foundation The Hague 2018  
Carel Thijssen (legal affairs) – Board Member Foundation The Hague 2018  
Gert Jonkers (treasurer) – Treasurer Foundation The Hague 2018  
Hielke Freerk Boersma (congress president) – Chair Foundation The Hague 2018  
Jan Kops (chair LOC)  
Lars Roobol (chair SPC)  
Ronald Smetsers (co-chair SPC)

### Scientific Program Committee (core)

Adrie Bos  
Anita Buiteman  
Arjen Becht, *NVKF*  
Barbara Godthelp, *ANVS*  
Eric van Rongen, *ICNIRP / Section NIR*  
Folkert Draaisma, *EUTERP*  
Frank Jungbauer, *Section RHP*  
Gert Jonkers  
Harry Slaper  
Helen Day, *SRP*  
Hielke Freerk Boersma  
Lars Roobol  
Leo van Velzen  
Marcel Greuter  
Paul van Rooijen  
Peter de Jong  
Rob Coppes, *NVvR*  
Ronald Smetsers  
Tom Grimbergen, *NCS*  
Ton Vermeulen, *ANVS*  
Yuri Franken, *ANVS*

### Scientific Program Committee (corresponding members)

Alexander Brandl, *ÖVS*  
Alexander Samoylov, *SRG Russia*  
António Miguel Morgad, *SPPCR*  
Caroline Schieber, *SFRP*  
Christoph Stettner, *ÖVS*  
Constantin Milu, *SRomP*  
Cyril Schandorf, *GARP*



Daniela Ekendahl, *CSRP*  
Francesco Mancini, *AIRP*  
Gordana Pantelic, *SRPS&M*  
Graciano Paulo, *SPPCR*  
Jean Koch, *ISRP*  
Jean-Paul Samain, *BVS/ABR*  
Jörg Feinhals, *FS*  
Joseph K. Amoako, *GARP*  
Kamil Szewczak, *PFTM*  
Katharine Thomson, *SRP*  
Klaus Henrichs, *IRPA*  
Ladislav Tomásek, *CSRP*  
Lorraine Currivan, *IRRS*  
Marie Claire Cantone, *IRPA/AIRP*  
Mercé Ginjaume, *SEPR*  
Michael Hajek, *ÖVS*  
Michal Gryzinski, *PFTM*  
Michèle Coeck, *EUTERP/BVS*  
Pedro Vaz, *SPPCR*  
Sébastien Point, *SFRP*  
Sergey Shinkarev, *SRG Russia*  
Sofía Luque, *SERP*  
Stephen Inkoom, *GARP*  
Tuuka Turtiainen, *NSFS*  
Valérie Chambrette, *SFRP*  
Zeljka Knezevic Medija, *CRPA*

### Local Organizing Committee

Anita Buiteman  
Bas Vianen  
Bert Gerritsen  
Carel Thijssen  
Jan Kops  
Jeroen Welbergen  
Gert Jonkers  
Hielke Freerk Boersma  
Linda Janssen-Pinkse  
Peter de Lange  
Rob Wiegers  
Sandra van den Eeden  
Ton Vermeulen  
Trude van der Heijden  
Wout Moerman



## Appendix B – Origin of Registered Participants

Australia: 1  
Austria: 16  
Belgium: 36  
Brazil: 1  
Canada: 1  
China: 3  
Czech Republic: 6  
Denmark: 7  
Estonia: 1  
Finland: 4  
France: 27  
Germany: 33  
Hungary: 6  
Iceland: 1  
Ireland: 7  
Israel: 2  
Italy: 11  
Japan: 8  
Korea: 8  
Luxemburg: 2  
Netherlands: 303  
Norway: 7  
Poland: 4  
Portugal: 2  
Romania: 12  
Russian Federation: 7  
Serbia: 1  
Singapore: 2  
Slovakia: 1  
Slovenia: 4  
Spain: 13  
Sweden: 11  
Switzerland: 28  
Taiwan: 3  
Ukraine: 1  
UK: 33  
USA: 8



## Appendix C – Subjects of the parallel and poster sessions

### Areas and sub-specialties

The scientific program committee used the following main topical areas:

1. Fundamental and/or general issues. Sustainability in radiation protection. Security of sources, installations and plants. Fundamental safety and security objectives and principles of protection, safety and security, and education and training herein. Emergency Preparedness;
2. Medical. All radiation protection activities and issues related to the safe, secure and economical use of radioactive isotopes and X-rays in health care applications, including education and training;
3. Industry. Operational radiation protection practices at e.g. NPP's, waste storage/disposal facilities for artificial nuclides as well as for NORM, re-processing plants, decommissioning projects;
4. Research and applications. R&D, licensing, construction, operation, effect on people and environment. Regulatory/public acceptance and radiation protection aspects of (new) developed isotopes and applications for medical and industrial use;
5. Non-ionising radiation. UV-radiation protection and UV health effects, skin cancer prevention, balancing UV-health hazards and benefits; Solar and artificial UV-exposures in environmental, medical, cosmetical and industrial situations for public, patients and workers; Laser safety and protection in medicine and industry.

For each area the following sub-specialties were available:

- A: Education & training
- B: Regulation & legislation
- C: Communication
- D: Risk management
- E: Stakeholder involvement
- F: Emergency response
- G: Research & development
- H: Physics; chemistry, biology
- I: Decommissioning
- J: Environmental remediation
- K: Waste management

### Parallel sessions

The subjects of the parallel sessions (between brackets the number of contributions):

- Protecting skin / eye lens (4)
- Regulation NORM (exposure) (4)
- Nuclear Emergency Management (4)
- Regulation & Legislation (4)
- Medical: Radiotherapy (4)



Environet & NORM Projects (4)  
Eye Lens Protection & Risk Assessment (3)  
Communication & RP Challenges (4)  
Medical: Training (4)  
Building Material & Exposure (4)  
Radon & UV (4)  
Emergency Preparedness (6)  
Indoor Radon (Implementation of EU-BSS) (6)  
Equipment & Software (6)  
Communication & Risk Management (6)  
Radon & Thoron (6)  
Harmonisation, Quality Control & Justification (4)  
NORM, Radon & Waste (4)  
Physics, Chemistry & Biology (3)  
Education & Training (4)  
Emergency Preparedness (4)  
RP Challenges in decommissioning (3)  
Dose estimations (3)  
Education & Training – Miscellaneous (4)  
Regulation & Legislation (4)  
Norm & decommissioning (4)  
Waste Management (4)  
Security (4)  
Environment & Exposure (4)  
Miscellaneous (4)

## Poster sessions

The subjects of the poster sessions (between brackets the number of pitches):

Classification, Monitoring & Decommissioning (3)  
Physics, Chemistry & Biology (3)  
Detection & Clean up (3)  
Regulation & Legislation (3)  
Medical (3)  
Communication & Risk Management (3)  
Medical dose & Biodosimetry (3)  
Modelling & Measuring (3)  
Radon (3)  
Occupational RP (3)  
Education & Training (3)  
Radon, Restoration & Waste (2)  
Radio-ecology (3)  
Occupational RP (3)



## Appendix D – Refresher courses

In this appendix the main topics, lecturer and number of granted certificates (i.e. the number of attendees) of the refreshers is given.

Title - Lecturer	Main Topic	Attendees
Applied radiological risk communication for the 21st century – Tanja Perko	Risk Perception & Communication I	110
Applying the content-form-source framework to risk perception – Jop Groeneweg	Risk Perception & Communication II	40
Computational dosimetry and modelling in support of radiation protection – Pedro Vaz	Computational Dosimetry	123
Decommissioning of non-nuclear sites – André Bloot	Decommissioning & Environment Remediation - I	64
Early and late deterministic effects of ionising radiation: concepts and variables – Jan Wondergem	Biological Effects I	110
Enhancing radiation safety culture in older nuclear installations – Folkert Draaisma	Nuclear Industry & RP I	60
Environmental remediation: from site characterisation to the end state – Christian Kunze	Decommissioning & Environment Remediation - II	46
From fundamental safety principles to operational radiation protection Programs – Amgad Shokr	Nuclear Industry & RP II	39
From power lines to mobile phones: are non-ionising electromagnetic fields hazardous? – Eric van Rongen	Non-ionising Radiation II	59
History, evolution and rationale of the RP system and in particular dose restrictions – Jean-Francois Lecomte	Young Professionals II	76
How to write a scientific paper – Adrie Bos	Young Professionals I	36
Identification of NORM cases and existing regulatory context – Bogusław Michalik	NORM I	72
Industry initiative on CT dose optimisation in cooperation with HERCA – Roy Irwan	Medical III	20
Intelligent technical approaches to the reduction of CT patient dose – Willi Kalender	Medical II	56
Low dose radiation effects: mechanisms and dose-responsive curves – Dik van Gent	Biological Effects II	138
Medical surveillance with focus on periodic examination of the eye – Bart Goessens	Protection of the eye lens etc. II	24
NORM characterisation and applied metrology – Leo van Velzen	NORM II	50
Optical radiation - Eye protection – Per Söderberg	Non-ionising Radiation I / Protection of the eye lens III	46
Patient dose & diagnostic reference levels – Hilde Bosmans	Medical I	88
Procedures for monitoring the dose to the lens of the eye, the skin and the extremities – Mercé Ginjaume	Protection of the eye lens etc. I	159
Radioactive source security - Mitigating the insider threat – Pierre Legoux	Security II	51



Radioactive sources – Security culture – Chris Englefield	Security I	91
Residential radon lung cancer risk estimation – James McLoughlin	Radon/Thoron II	56
The presence of radon in indoor air – Hans Vanmarcke	Radon/Thoron I	74
The young generation in radiation protection: current situation, possibilities and challenges – Sylvain Andresz	Young Professionals III	46
Radioactive Waste Management – Jeroen Welbergen	TV Radioactive Waste I	22
NORM Reuse and Waste Disposal – Kees Oranje	TV Radioactive Waste II	22
Demonstration of Long-Term Safety of Radioactive Waste Disposal – Janez Perko	TV SCK-CEN I	11
Low Dose Effects of Ionising Radiation – Marjan Moreels	TV SCK-CEN II	27
Total	29 Refreshers	1816



## Appendix E – IRPA2018: Summary of scientific sessions

### Introduction

From 4 – 8 June 2018, the fifth European Regional IRPA Congress ('IRPA2018') was held in the World Forum, The Hague, The Netherlands. There were about 620 participants from 37 different countries. In two contributions, we will report on this congress. In this issue of the NTvS, we give a summary of the scientific Program of the congress. The next issue will give a more general overview of the congress.

Over 330 abstracts and about 200 posters were submitted. The scientific Program consisted of:

- 16 key note lectures, including contributions from the EU, ICRP, ICNIRP, IAEA and IRPA, distributed over four plenary sessions
- An EUTERP workshop, with about 80 participants
- 29 refresher courses (four of which were held in combination with Technical Visits)
- 126 lectures, distributed over 30 parallel sessions
- 41 poster pitches, distributed over 14 poster sessions

The main theme of the conference was ***Encouraging Sustainability in Radiation Protection***, which theme could be found back in many of the talks, sessions and other events planned throughout the week. Below we focus on two aspects reflecting our efforts to achieve sustainability in radiation protection.

It is an impossible task to give an overview of a whole conference in just a few pages. Although the chairpersons of the scientific sessions have handed in their reports on every session, the person making the summary of all of these reports cannot avoid being biased. In the final section of this article we have tried to highlight some scientific topics separately. However, it is strongly recommended to look at the book of abstracts yourself or to consult the full posters or papers, that are, or will be available at the IRPA2018 website for all participants.

In the next issue, we will report on the results of the surveys on the scientific Program in general and the refreshers and keynote lectures in particular.

### Encouraging sustainability by having refresher courses

In total, 29 refresher courses were given, four of which were given on site, at one of the technical visits. This gave people an opportunity to brush up their knowledge on a certain subject. Some refreshers were taught at a basic and others at an advanced level.

Subjects included security of radioactive sources, decommissioning and remediation, eye lens dose, NORM, patient dose and optimisation, radon and associated risk, safety culture, risk perception and communication, fundamentals of radiation protection and non-ionising radiation.

The refresher courses were attended by 1816 people, meaning that (on average) each participant took three courses, and that (on average) each course was attended by 63 participants.





## Encouraging sustainability by giving free space to the Young Generation

Three refresher courses, like the one entitled “How to write a scientific paper” were specifically aimed at the young generation.

A Young Professional Award was offered to the Young Professional who presented the best paper on a subject within radiation protection. Eleven countries proposed a candidate, nine of which held a talk about a medical subject. It was encouraging for the organisers to see a high percentage of women amongst the candidates. The winner of both the jury prize and the public prize was Nadia Benabdallah from France, who presented her PhD thesis work conducted at LEDI, IRSN’s internal dose assessment laboratory, entitled “Optimisation of dosimetry in alpha therapy by a multi-scale approach: application to the treatment of bone metastases with Ra-223”.

In addition, during this conference, IRPA launched its Young Generation Network. It is open to students and radiation protection professionals (or professionals in allied fields) in the first 10 years of their career and aims to support less experienced individuals by offering them opportunities to network with other specialists from around the world.

## Conclusion

Looking back on IRPA 2018, we can say the Program was very varied, and the general quality of the abstracts and talks was quite high. A large number of subjects was covered, indicating that IRPA 2018 was of service to a broad community of people working on all aspects of radiation protection.

As far as sustainability is concerned, it was nice to see so many young people present at the conference, and so many contestants competing for the Young Professional award, presenting high quality work. Also, the launch of IRPA’s Young Generation Network will boost the opportunities for young people in our profession.

We expect to see a continuation of these nice developments at the next European regional IRPA congress in 2022, in Budapest, Hungary.

## Summary of scientific sessions

### Fundamental issues

Mr. Huyskens held a lecture asking the question how sustainable the ICRP recommendations actually are, and how they can be improved. His top 4 of items often not understood or misused gave us a lot to think about:

- Anxiety for health risks from low dose exposures
- Confusion about dose quantities & units
- Anxiety for internal exposure from radioactivity
- Confusion about dose limits for exposure of public.

Mr. Orell from the IAEA made the case that radiation protection can and must be coupled to the UN sustainable goals. In the opinion of the IAEA, the problem of radioactive waste is the most serious one still present.



In one of the poster pitches, the term “Intergenerational justice” was coined: measures should be just for future generations also. That may lead to the conclusion that measures that are too expensive could be considered unjustified.

### Medical

There are new developments in Computer Tomography (spiral scanning) of the breast. Mr. Kalender showed that this can lead to a reduction in dose and improved resolution.

Important highlights in the medical field were the talks about radiotherapy with protons. Many new centres for proton therapy have started irradiating patients, or are under construction. Much work is done on dosimetry.

One of the talks showed that in the case of proton therapy, the RBE (relative biological effectiveness) of protons can be (much) higher than the value of 1.1 recommended by ICRU.

### Decommissioning

Since many installations now are entering their decommissioning phase, attention for radiation protection during this phase is on the rise. Mr. Monken-Fernandes gave a key note lecture on dose planning for decommissioning projects.

One of the lectures showed us a non-intuitive fact: decommissioning can be done on the principle of measurement, but often doing calculations and/or simulations leaves us with more accurate, cheaper AND more reliable results.

In the IAEA and EU BSS (Basic Safety Standard), the clearance levels for numerous radionuclides have gone down considerably. In general, this makes it more difficult to clear material. During IRPA 2018, it was shown that in particular, clearance of irradiated concrete has become much harder under the new BSS.

One of the studies presented, compared lung cancer and leukaemia incidence between the nuclear institutes in Mayak (Russia) and Sellafield (United Kingdom). It was laced with many interesting ERR (excess relative risk) numbers.

### Non-Ionising Radiation

In his key note lecture, Mr. van Rongen, the chair of ICNIRP, presented their new guidelines on electromagnetic fields, optical radiation and ultrasound.

Another lecture showed the importance of radiation protection from UV radiation from the sun. In the North-West of Europe, skin cancer (particularly melanoma) is on the rise, actually killing thousands of people annually, many more than environmental radioactivity does. Sadly and interestingly, Switzerland appears to have a very high incidence of melanoma, which is not quite understood. One of the speakers proposed the introduction of an UV-millisievert equivalent.



## NORM

In his key note lecture on NORM, Mr. Tsurikov made the case that for wastes with low specific radioactivity, as is the case with NORM, we have a situation of over-regulation. The new IAEA and EU BSS (Basic Safety Standards), have lowered the clearing- and exemption levels of many radionuclides even further. This makes it necessary to take even more (often costly) measures and precautions for radiation protection, while it is not clear whether these measures and precautions are ALARA: health benefit seems quite low compared to the costs. Especially in the developing countries, health benefit might be higher if spent on matters more pressing than low level ionising radiation.

It was pointed out that while doing measurements on NORM material, the lack of secular equilibrium in the uranium and thorium decay chains (e.g. because due to chemical processes performed on the material) often poses a challenge.

Another “hot topic” in the field of NORM was the one of (economic/environmental) sustainability. Should we regard NORM as waste or as a valuable resource in a circular economy? Is all NORM waste intrinsically safe, or should there be a public discussion on re-using NORM? One example thereof is the discussion about making building materials using NORM products as an ingredient.

## Emergency preparedness

In his key note lecture, Mr. Raskob showed that there is still much to harmonise in Europe, where emergency measures are concerned. Also, there is no harmonised response in Europe when special events occur, like the spreading of very diluted ruthenium-106 over parts of Europe in October 2017.

The EU BSS requires transparency in decision making in case of a nuclear accident. There is much optimisation still to be done: when is evacuation more effective? When sheltering? The BSS did not lead to a single European answer to those questions yet. Even in the case of 2 neighbouring countries, harmonisation can be a challenge.

Some talks presented models for exposure due to radioactivity in the food chain, and also there were presentations on the benefits and disadvantages of Iodine Thyroid Blocking, as well as schemes to measure the uptake of radioiodine and other radionuclides.

One speaker reported about a regional training with the fire brigades of Aachen in Germany and of the region of Zuid-Limburg in the Netherlands. This led to many interesting new ideas and take home messages for both countries, which could also be of benefit for other neighbouring countries in Europe. It made clear what the benefits of cross border training are, it was highly recommended that countries should hold these trainings/exercises on a regular basis.

## Risk perception and communication

During IRPA 2018, there was much talk about risk communication and risk perception. It has been said that “emotion is a more powerful trigger than bare facts”. This makes it difficult for an expert in radiation protection to engage with the public, unless he is also trained in addressing the emotions and social issues.



A separate session on communication was held, which was “sold out”: the room was full. This made clear that many participants are also convinced that risk perception and risk communication are important skills in radiation protection.

In this session, it was told that stakeholder engagement helps in case of societal concern. In another session, we saw an example where that already went the wrong way, in Fukushima. After the accident there, people didn't trust the government, nor the radiation measurements they communicated. Citizens started doing measurements themselves, see e.g. the SafeCast project.

The take home message was: involve stakeholders, give clear messages, and repeat them consistently.

### Education and training

Apart from a EUTERP meeting, which lasted a full afternoon and involved about 80 participants, there also were lectures about education and training.

Learning outcomes are now formulated in terms of knowledge, skills, and competences, as demanded by the European Quality Frame. The distinction between RPO's (radiation protection officers) and RPE's (radiation protection experts) is making changes in the education systems in several European member states.

There is already much overlap in the curriculum used in the EU member states. Someone moving from one state to another, often only needs to learn the national legislation. But still, if one has an accreditation in one member state, it can be difficult to get full acknowledgement for that when applying for an accreditation in another member state.

### Occupational

Eye lens dosis is still a much debated item in occupational radiation protection. At the IRPA conference, there were talks about monitoring of eye lens dosis and the IRPA recommendations.

Also, wearing dosimeters correctly when also wearing a lead apron is still a subject of talks. We were told that when a dosimeter is worn on a lead apron, the back scatter is very limited, while it is substantial when one does not wear an apron. One should correct for that effect, especially when copper is used in the dosimeter housing.

Another lecture told us about the benefits of retrospective dose assessment. The though provoking title was “Looking for a radium needle in a building?”

The participants were also given examples of pragmatic systematic approaches to help bridge the gap between generic guidelines and users/applications. These can help to optimise dose received by workers.

### Radon

All European countries are making radon action plans and/or doing surveys, which is now required by the new EU BSS. Many countries need to introduce the highest reference level allowed by the EU, of 300 Bq/m<sup>3</sup>.



Much work is done on building materials and their relation to radon and thoron levels in buildings. In principle, the EU BSS allow for a large increase in radon/thoron dose in homes, compared to the existing situation, because of the new regulations for building materials.

### Security

In the session on security, there was a talk about preparing emergency services for nuclear terrorism, so we may cope better with such an event, making the follow-up less chaotic.

Schemes were proposed for measuring radioactive material with a signal near the background value. By making use of data patterns in string measurement, one can make useful detection of possibly illegal activities much faster.

Also, talks were held about the design of measurement and intervention vehicles.



## Appendix F Technical Visits

In this appendix we summarise the main characteristics of the intended Technical Visits.

- TV1** Research - Nuclear Research Reactor / RID, Delft: reactor and neutron beam lines. Half day excursion with Refresher Course
- TV2** Research - Outer Space / ESA, Noordwijk: outer space radiation doses. Full day excursion
- TV3** Industry - NORM Depository/Reuse Site, Maasvlakte: very low activity / NORM waste. Full day excursion with Refresher Course
- TV4** Industry - Container Scanning / Customs, Rotterdam Harbour: scans of containers / nuclear detection. Half day excursion
- TV5** Medical - Health Care / Philips, Best: medical scanning equipment and non-ionising radiation. Full day excursion with two Refresher Courses
- TV6** Industry - Waste Management / COVRA, Vlissingen: (medical) waste management. Full day excursion with Refresher Course
- TV7** Studie Centrum Kernenergie / Centre d'Étude d'Énergie Nucléaire (SCK/CEN): nuclear energy, radionuclide laboratories, reactor technology, decommissioning and decontamination, waste management. Full day excursion with three Refresher Courses
- TV8** Industry - Uranium Enrichment / Urenco, Almelo: uranium enrichment. Full day excursion with Refresher Course
- TV9** Industry - Geothermal NORM / ECW, Middenmeer: NORM resulting from application of geothermal energy. Full day excursion with Refresher Course
- TV10** Applied Science – KVI-CART, Groningen: applied nuclear physics, accelerator physics. Full day excursion with Refresher Course
- TV11** Industry – Application of (Non-)Ionising Radiation: process control by means of X-ray sources and (narrative) on measures to minimise NIR exposure. Half day excursion with two Refresher Courses
- TV12** Non-Ionising Radiation - Telecom providers (Agentschap Telecom). Full day excursion with Refresher Course