

THE INFORMATION SYSTEM ON
OCCUPATIONAL EXPOSURE IN MEDICINE,
INDUSTRY AND RESEARCH:
INDUSTRIAL RADIOGRAPHY

Annual Report 2020

INTERNATIONAL ATOMIC ENERGY AGENCY
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FOREWORD

The International Atomic Energy Agency is the world's central intergovernmental forum for scientific and technical co-operation in the nuclear field. It works for the safe, secure and peaceful uses of nuclear science and technology, contributing to international peace and security and the United Nations' Sustainable Development Goals.

ISEMIR is the acronym for the Information System on Occupational Exposure in Medicine, Industry and Research. Optimization of protection is one of the three general principles of radiation protection. ISEMIR-IR is a tool for radiation protection optimization for non-destructive testing (NDT) companies, carrying out industrial radiography (IR). ISEMIR-IR is developed as a web-based tool for regular data collection and analysis of occupational doses for individuals in IR, and for the use of this information to improve occupational radiation protection. It assists IR facilities in benchmarking their arrangements in radiation protection and safety, and hence it promotes the implementation and optimization of occupational radiation protection.

In 2020, in response to the IAEA General Conference Resolution GC(64)/RES/9, requesting the Secretariat to promote ISEMIR with the aim to strengthen the safety of workers in industrial radiography and interventional cardiology, the IAEA has launched a global survey to determine the best course of action. This aimed to improve the ISEMIR-IR system and to meet the needs of users, such as NDT service providers. The survey consists of two questionnaires, one for the regulatory body and the other one for the NDT service providers, which were sent to all the Member States. The regulatory bodies of Member States were kindly requested to complete the respective questionnaire and to disseminate it to the NDT service providers in their country, as well as to encourage its completion. The analysis results of this global survey will be presented in this annual report.

The current report is intended to contain the overall review of the ISEMIR-IR system, the actual status of the database collections and give a summary of activities for the year 2020. The report will also provide some conclusions and recommendations for the future development of the system.

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1 INTRODUCTION

The ISEMIR project was initiated by the IAEA in January 2009 to focus on very specific topical areas where occupational radiation protection needs to address non-trivial occupational exposures and may face unresolved issues and gaps.

In the design phase, the IAEA was assisted by an Advisory Group with representatives of international organizations as well as from the five main world regions - Working Group on Industrial Radiography's (WGIR). The Advisory Group identified two specific areas in radiation use, where non-trivial occupational exposures occur, interventional cardiology and industrial radiography.

For each of these two specific topical areas, a working group was set up with experts covering the particular area in a comprehensive way, with respect to professions, type of radiation usages, geographical regions and other factors.

The main task of the WGIR was to draw an overview of the situation concerning occupational exposures and radiation protection of staff in IR worldwide. The WGIR was comprised of professionals with experience of working for NDT companies, client companies, NDT societies, technical service organizations, including education, training and inspection, as well as for regulatory bodies.

As a part of its actions, WGIR performed a worldwide survey of occupational radiation protection in IR over a period of about one year, from mid-2010 to mid-2011. Responses were received from 432 industrial radiographers, 95 NDT companies, and 59 regulatory bodies. The data collected were able to demonstrate:

- a clear need for worldwide improved optimization of occupational radiation protection in IR
- an ability to compare doses for specific occupational roles and conditions, and to assess the impact of radiation protection actions, and to follow dose trends.

The results of the survey, including its comprehensive analysis, have been included in the TECDOC: The Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR): Industrial Radiography (IAEA-TECDOC-1747) [2].

With regard to the results and following WGIR members' advice, the Agency developed and launched The Information System on Occupational Exposure in Medicine, Industry and Research: Industrial Radiography ([ISEMIR-IR](#)) [3] in 2016.

In order to increase the number of active users in the ISEMIR-IR system, as well as enhance users' experience, IAEA launched a global survey in the October which is the second global survey of ISEMIR-IR. The first one was mentioned above. The survey consists of two questionnaires, one for the regulatory body with 8 main questions and the other one for the NDT service providers with 18 main questions in several languages (Chinese, Czech, English, French, German, Japanese, Korean, Portuguese, Slovak, Russian, Spanish and Turkish). The questionnaires were reviewed by working group members. The final versions of the questionnaires were addressed with a letter to the NCPs, Regulatory Bodies and NDT companies from the previous survey as well as to the companies registered in ISEMIR-IR with a call to complete the questionnaire and assist its dissemination. Collection of completed questionnaires was planned to end before 21 December 2020, but which was extended to 31 January 2021 finally. The data received was analysed and demonstrated in this report.

2 STATUS OF THE SYSTEM

2.1 USER REGISTRATION

In the year of 2020, 3 new companies registered with ISEMIR-IR, the number of the users has reached 41 (FIG. 1).

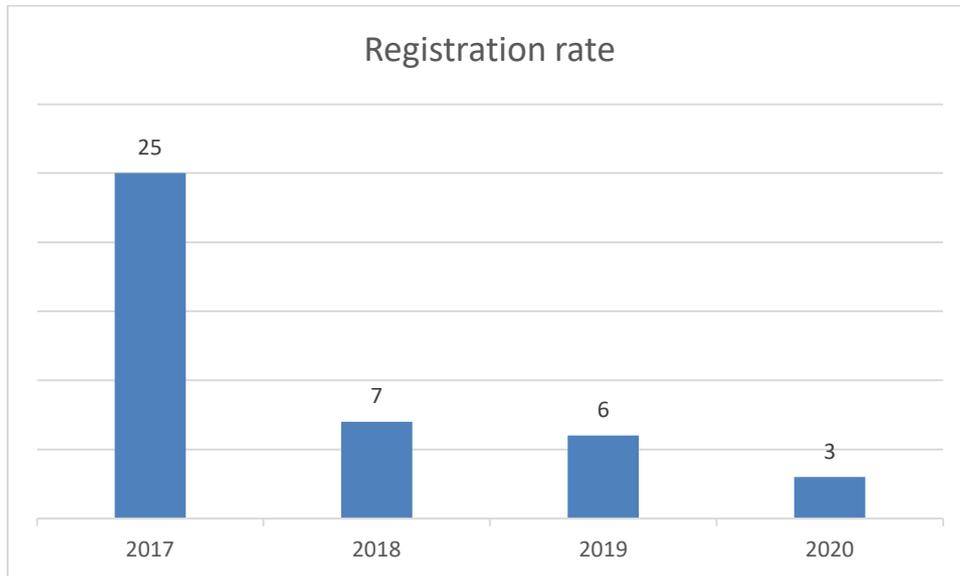


Fig. 1. Annual registration rate

The registered users come from 29 countries that are distributed in Asia, Europe, North American, South American, Africa, Australia.

2.2 DATA STATISTICS

The database contains information about 41 companies, comprising 32 datasets. 8 of these are completed but cannot be reflected in the statistics because the submission process was not completed (the final submission button, labelled 'Publish' had not been clicked). Reminder letters for these submissions have been addressed to the corresponding companies annually.

3 ACTIVITIES CARRIED OUT IN 2020

3.1 CONSULTANCY MEETING

The second Consultancy Meeting of the ISEMIR-IR was held 27-29 January 2020 at the IAEA Headquarters, Vienna, Austria, with the aim to improve the ISEMIR-IR system and the number of users. A global survey on ISEMIR-IR was proposed and two offline questionnaires for regulatory body and NDT service providers were initialled during this meeting. A webinar on ISEMIR-IR was arranged to introduce the IAEA strategies on developing the ISEMIR-IR and the benefits of participating in the ISEMIR-IR for practitioners in industrial radiography.

3.2 WEBEX MEETINGS

Two WG WebEx meetings in April and August have been held to discuss the actual status of the actions previewed. The minutes of the meeting have been prepared and addressed to WG members.

A webinar was held on 28 January 2020 during the consultancy meeting to discuss the main difficulties NDT companies encounter, concerning occupational radiation protection and how IAEA Information

System of ISEMIR-IR contributes to its optimisation. There were three presentations given by three experts which are listed below.

- Strategic vision of the IAEA on ISEMIR-IR development, by Jizeng Ma
- A view of the British National NDT Institute, by David Gilbert
- A view of practitioner on the ISEMIR-IR benefits, by Richard Van Sonsbeek

3.3 ACTION LIST

One of the main outputs from the first Consultancy meeting in 2019, was the development of the action list to discuss the mechanism for the ISEMIR-IR operation, to name key actions important for proper functioning and approaches to promote the database to the Member States, in general and private NDT companies, and final users in particular.

The action list contains several blocks of activities to be updated, once the new actions are added or a new status for the actions prescribed is available. Due to the situation with COVID-19, worldwide events and meetings in action list were organized online, cancelled or postponed.

3.4 ISEMIR-IR SYSTEM

Email reminders were sent to all registers on 21 April 2021, to require the annual collection of 2020, before 30 June 2021.

Because of the huge data from the global survey, uploading annual collections from ISEMIR-IR system backend is ongoing.

3.5 NATIONAL CONTACT PERSON (NCP)

The request to nominate National Contact Person (NCP) to assist ISEMIR promotion was addressed to the NLOs in September 2019. The Agency received 23 nominations for ISEMIR-IR from NLOs up to date of publication of this report (Table.1)

TABLE 1. NOMINATED COUNTRIES OF ISEMIR-IR NCP

Year	Countries	Total
2019	Greece, Latvia, Uruguay, Kingdom of Eswatini, Portugal, Macedonia, Lithuania, Bangladesh, Thailand, Mauritius, Czech Republic, Romania, Turkey, Bulgaria, Malaysia, Cyprus, Armenia, Antigua and Barbuda, Argentina	19
2020	Egypt, Tanzania, China	3
2021	Nigeria	1

3.6 ISEMIR-IR POTENTIAL USERS – INTERNATIONAL PROMOTION

During 2020, information on ISEMIR-IR has been presented at following national or international events:

- Webinar on Online database for Radiation Protection Optimisation in Industrial Radiography, 28 January 2020
- 64th IAEA General Conference, 21-25 September 2020

- ICNDT General Assembly virtually, 31 July 2020
- EFNDT General Assembly virtually, 22 April 2020

4 ISEMIR-IR SURVEY 2020

During the consultancy meeting from 27-29 January 2020, a global survey on ISEMIR-IR was proposed and two draft questionnaires for regulatory body and NDT service providers were initialled for promoting the ISEMIR-IR system and the optimization of occupational radiation protection of ISEMIR-IR users.

The ISEMIR-IR Working Group (WG) organized two virtual meetings which, were held on 24 April and 5 August 2020 to prepare the two questionnaires for the global survey. The questionnaire for the regulatory body comprised of 8 main questions, which was written in English. The questionnaire for NDT service providers composed of 18 main questions, which was written in several languages (Chinese, Czech, English, French, German, Japanese, Korean, Portuguese, Slovak, Russian, Spanish and Turkish).

The global survey was launched by IAEA on 30 October 2020. The questionnaires were distributed widely primarily using IAEA contacts with regulatory bodies, the National Contact Persons (NCPs) and the registered users of ISEMIR members and others. The deadline of submitting the questionnaires was 21 December 2020, but it was postponed to 31 January 2021 in the end.

Up to the final deadline, 31 January 2021, there are 46 responses from regulatory bodies of 43 countries (out of 152 countries) and 284 responses from NDT service providers from 42 countries. The regions of regulatory bodies and NDT service providers are listed in Table 2 and Table 3 separately.

TABLE 2. NUMBER OF QUESTIONNAIRES FROM REGULATORY BODIES

Region	Questionnaires received	Countries
Africa	7	7
Asia-Pacific	12	10
Europe	22	21
Latin America	3	3
North America	2	2
Total	46	43

TABLE 3. NUMBER OF QUESTIONNAIRES FROM NDT SERVICE PROVIDERS

Region	Questionnaires received	Countries
Africa	30	9
Asia-Pacific	100	11
Europe	130	15
Latin America	15	6
North America	9	1
Total	284	42

62 % (176 out of 284) of questionnaires from NDT service providers have been not fully completed, some of the mandatory information is missing. Email reminder for calling the missing information and submission has been sent to the NDT service providers. The final report of the global survey will be published on the website of [ISEMIR-IR: Industrial Radiography | IAEA](#).

5 CONCLUSIONS

As conclusion, it is necessary to emphasize that ISEMIR-IR is a free online tool, designed with the support of a group of experts to assist NDT companies, to optimize occupational radiation protection and enhance safety culture. In the meantime, since the information system is relatively new, it is also open for future updates. The IAEA ISEMIR-IR team appreciates comments, suggestions and assistance provided by NDT companies and other users of this tool.

The Agency respects the needs of NDT companies, that is why ISEMIR-IR has been designed as a system with a high level of data security. That means, that the third parties, including regulatory bodies, have no access to the data. The anonymized statistics for benchmarking purposes is only available for NDT companies, who uploaded at least one dataset.

Despite the global slowdown due to the COVID-19 pandemic, the global survey was still very successful. It is highly appreciated the cooperation and contribution of regulatory bodies and NDT service providers, in supporting the IAEA to improve the ISEMIR-IR system and to meet the needs of the users.

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