Current practice of occupational radiation protection in industrial radiography

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John Le Heron[1], Richard van Sonsbeek[2], Gonzague Abela[3], Francisco da Silva[4], Razak Hamzah[5], Thomas Levey[6], Matthias Purschke[7], Kamal Sahaimi[8], Christian Lefaure[9]

[1] Division for Radiation, Transport and Waste Safety, IAEA, Vienna, Austria
[2] Applus RTD, Rotterdam, The Netherlands; [3] EDF, Saint Denis, France
[4] IRD/CNEN, Rio de Janeiro, Brazil; [5] Malaysia Nuclear Agency, Kajang, Malaysia
[6] Acuren Group Inc, Edmonton, Canada; [7] DGZfP, Berlin, Germany
[8] CNESTEN, Rabat, Morocco; [9] Consultant, Paris, France

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International Atomic Energy Agency

ISEMIR
Information System on Occupational Exposure in Medicine, Industry and Research

Outline

- ISEMIR & WGIR
- The WGIR survey
- Selected results
- Tools for optimization of protection

ISEMIR & WGIR

- Information System on Occupational Exposure in Medicine, Industry & Research
  - Launched in January 2009, to help improve occupational radiation protection in targeted areas
- Working Group on Industrial Radiography (2010)
  - A worldwide survey of current occupational RP practice in IR
    - 3 Questionnaires
      - Industrial Radiographers (Operators)
      - NDT Companies
      - Regulatory Bodies

The questionnaires addressed:

- Education & training of radiographers in radiation protection
- Learning from accidents, near misses, and deviations from normal operations
- Systems and procedures in place for safe operation
- Emergency preparedness and response
- Individual monitoring

Distribution & Responses

- Translation into several languages
- Distribution:
- Contacts of WGIR members for the Operator & Company questionnaires
- IAEA for RB questionnaire

	Operator	Company	Regulatory Body
English	X	X	X
German	X	X	
French	X	X	
Portuguese	X	X	
Spanish	X	X	
Dutch	X		
Russian	X	X	
Chinese	X	X	

- Responses, after about one year of distribution:

	Operator Questionnaire			Company Questionnaire		Regulatory Bodies
	Operators	Companies	Countries	Companies	Countries	
Global	432	151	31	95	29	59

A few selected results

- But first a caveat or two:
  - Operator and company questionnaires:
    - Method of distribution probably means:
      - Participants are likely to be at the “better end” of the practice spectrum
    - Many questions involved self-assessment of habits or performance
      - Hence perception versus reality

Results from the survey probably give an over-optimistic picture

Learning from incidents

- Rate of occurrence in industrial radiography:

	Operator responses	Company responses
	# per operator per 5 year	# per operator per 5 year
Accidents	0.04	0.03
Near Misses	0.1	0.05
Deviations	0.6	0.05

- Level of dissemination of lessons learned appears to be low
  - 40% of NDT companies do not share information on incidents with other organizations

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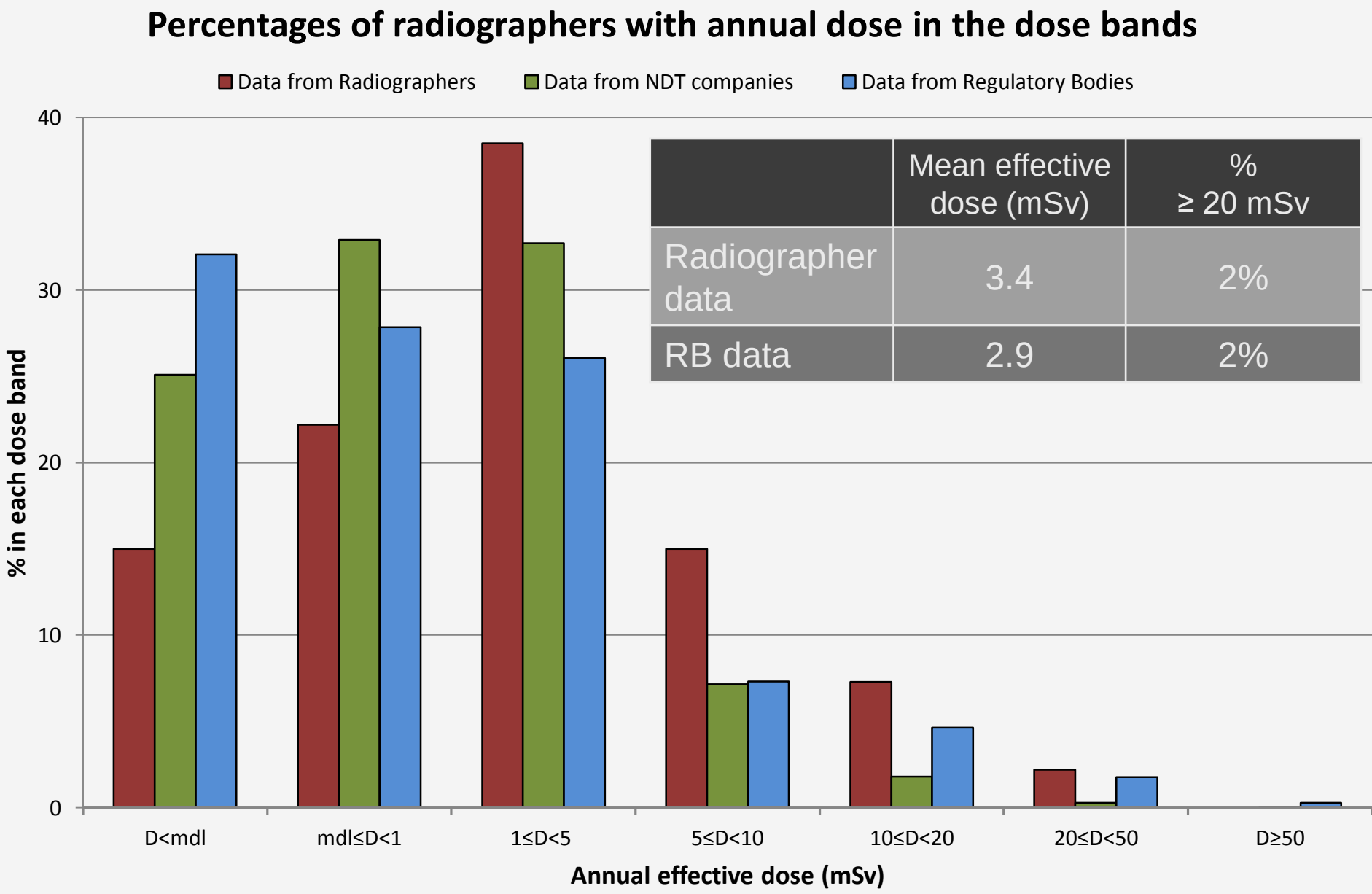
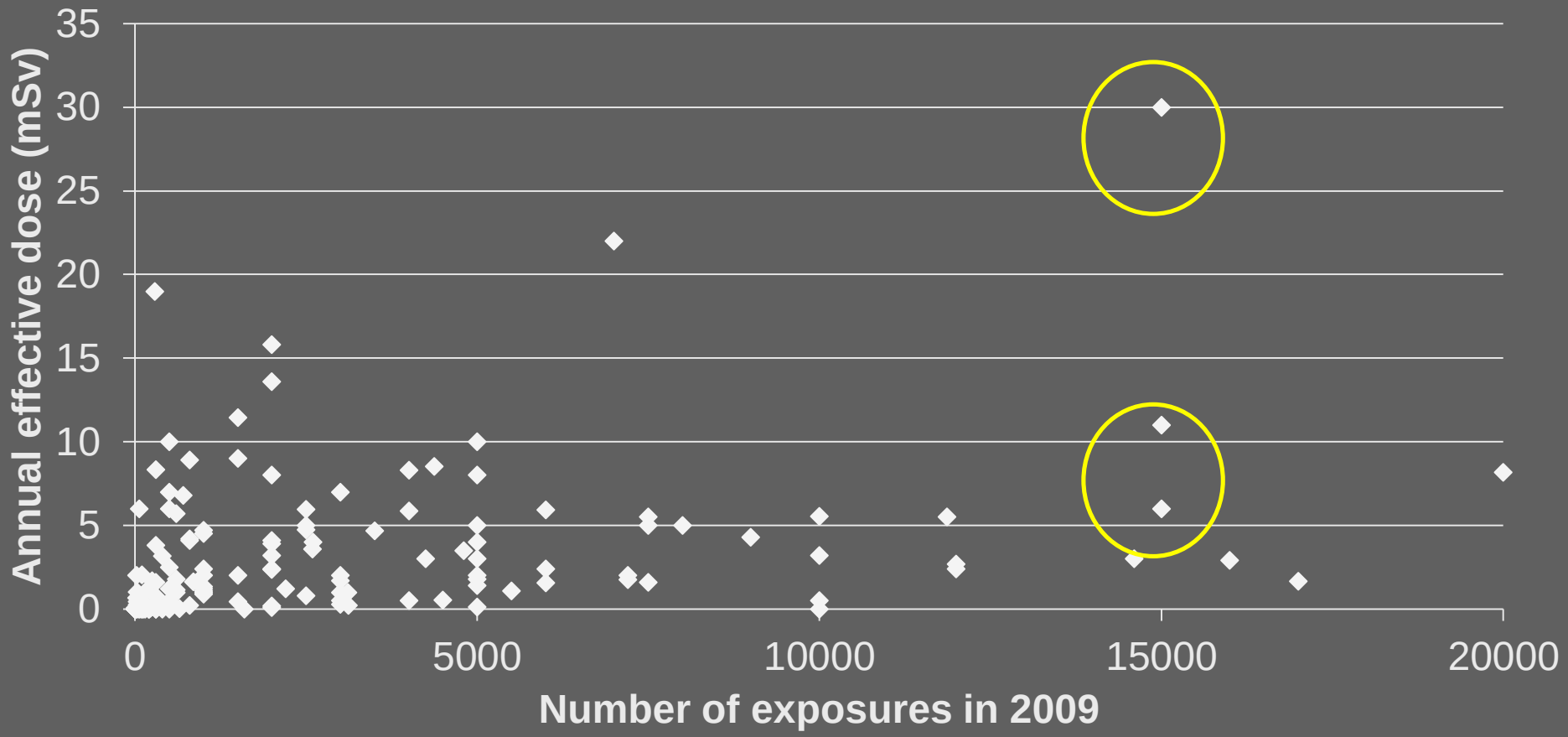
Individual monitoring - 2009



	Mean effective dose (mSv)	% ≥ 20 mSv
Radiographer data	3.4	2%
RB data	2.9	2%

Dose versus workload

Annual effective dose versus annual workload:
Industrial radiographers, 2009



Scope for improved optimization of protection

ISEMIR – an international database (1)

- A tool for optimization of Occupational RP
  - Primarily for the end-user
- Based around individual NDT companies
  - Individual personnel in each company
    - Occupational doses
    - Radiographic workloads
    - Individual attributes that might influence occupational dose

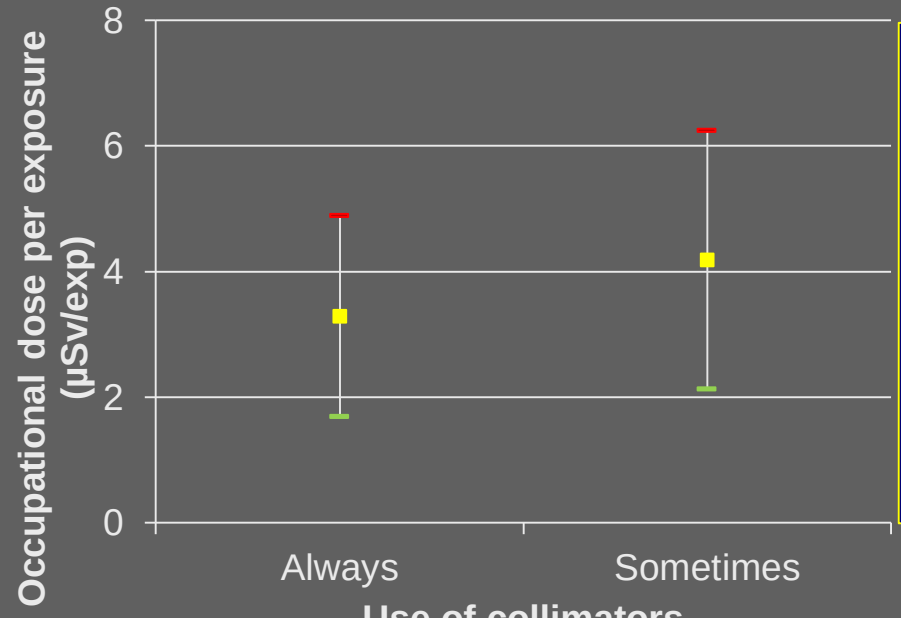
ISEMIR – an international database (2)

Individual's metric:

- Dose per exposure
  - Workload
  - Doses

Individual's attributes:

- Professional training
- RP training
- Role
- RP habits
- Sources used and where
- Incidents



Analysis of dose per exposure

- Based on any combination of:
  - Individuals' attributes

Bench-marking

- NDT company performance
- Individuals within a company

The Road Map

- Self assessment tool for NDT companies
- Based on questions in the Company questionnaire
- Results of the Company questionnaire are used to define good practice

A company's strengths and weaknesses identified

Summary

- The worldwide survey showed that there is considerable scope for improvement in occupational radiation protection in industrial radiography
- Two tools for optimization are being developed for use by NDT companies
  - International ISEMIR database
  - The road map

J.Le.Heron@iaea.org

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