Overview of GSR Part 3: Radiation Protection and Safety of Radiation Safety Sources: International Basic Safety Standards

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Outline

Introduction

Historical remarks

SS 115 (1996)

GSR Part 3 (2014)
  Justification
  Optimization
  Responsibilities

Summary
1969 Publication 15
Generally disapproved - e.g. “anti-crime” fluoroscopy & customs exams
If permitted, then under the supervision of a radiologist

1971 Statement
As above plus: Hijackings – Security screening of airline passengers may be justified

1977 Publication 26
In addition to the above:
• Examinations for occupational, medico-legal or insurance purposes included as medical procedures
• Advantages for various parties needed to be considered in the justification

1990 Publication 60
• Nothing specific
• Occupational, medico-legal or insurance purposes no longer included in medical exposure

1996 – SS 115
Non-medical imaging – ICRP

1996 Publication 73
- Medical exposure now included the exposure of individuals for screening and medico-legal purposes
- Justification for these needs special consideration – but by whom?

2007 Publication 103
- Medical exposure no longer includes medico-legal
- Certain exposures deemed to be unjustified:
  - Occupational, health insurance, or legal purposes undertaken without reference to clinical indications
  - But caveats:
    - Unless the examination is expected to provide useful information on the health of the individual examined, or in support of important criminal investigations.
    - And noting that:
      - Clinical evaluation of the images would be expected

2011/2014 – Revised BSS
SS 115 (old BSS, 1996)

SS 115 has 2 relevant requirements
– both in the Medical Exposures Section
– both in the Justification sub-section
SS 115 (old BSS, 1996)

1st Requirement:

- Exposures for occupational, legal or health insurance purposes undertaken without reference to clinical indications
  - Default position that these are not justified
  - But there are 2 caveats:
    • unless expected to provide useful information on the health of the individual examined; or
    • unless the specific type of examination is justified by those requesting it in consultation with relevant professional bodies
1st Requirement:

- However, there are problems:
  - The 1st caveat would suggest it was really a medical exposure
  - With the 2nd caveat
    - The requester is being asked to perform the justification
    - Further, who are the relevant professional bodies?
      - Medical?, Legal? Insurance? Worker?
SS 115 (old BSS, 1996)

1st Requirement:

- More problems
  - If such an exposure is considered justified
    • What radiation protection is being afforded to the irradiated person?
    • Is it medical, occupational or public exposure?
  - No answer in BSS 115
    • The implication is medical exposure
    • But the definition of medical exposure excludes it
SS 115 (old BSS, 1996)

2nd Requirement:

- Exposures for theft detection purposes
  - Deemed to be not justified
- But if they do take place, they are:
  - Not medical exposure, but
  - Subject to the requirements for occupational and public exposure
SS 115 (old BSS, 1996)

2nd Requirement:

- However, there are problems:
  - No caveats - Is this a problem???
  - Is the irradiated person subject to occupational or public requirements?
    - Not clear
    - Does it depend on the circumstances?
    - If so, what circumstances?
  - But also
    - Nothing covering the various forms of security screening
An opportunity to introduce a consistent and comprehensive approach

and noting that since SS 115 (1996) was published

- Focus on security has increased dramatically
- Inspection imaging technology has evolved
GSR Part 3

Human imaging using radiation for purposes other than medical diagnosis, medical treatment or biomedical research

Chapter 3: Planned exposure situations
  Requirement 10 – Justification
  Requirement 18 – Non-medical Human Imaging
GSR Part 3 – Planned exposure situations

Human imaging for purposes other than medical diagnosis or treatment

- There was a need to develop a consistent and comprehensive approach, using the ICRP RP principles

Two types of exposures:

- Those carried out by medical staff using conventional radiological equipment e.g. exposures for occupational, legal or insurance purposes without reference to clinical indications
- Exposures by non-medical staff e.g. security screening, screening of cargo
Revision of the BSS, GSG-5

Categories of non-medical human imaging

Category 1 – Non-medical human imaging that:
- Takes place in a medical radiation facility
- Using medical radiological equipment
- Performed by radiology personnel
- With the image reported by a radiologist/doctor

for

- Obtaining legal evidence
- Insurance purposes
- Employment purposes
- Immigration purposes
- Age determination
- Assessing physiological suitability/status
- Detection of drugs within a person
Revision of the BSS, GSG-5

Categories of non-medical human imaging

**Category 2** – Non-medical human imaging that:
- Takes place in a non-medical facility (often in a public place)
- Using specialized inspection imaging equipment
- Performed by non-radiology personnel
- With the image viewed by a non-medical person

for

- Detection of concealed weapons:
  - Airline passengers
  - persons crossing a national border
  - visitors to prisons, court houses, public buildings, etc
  - prisoners within a prison

- Theft detection
- Screening cargo containers and vehicles
- Screening for detection of drugs inside a body
GSR Part 3 – Justification

BSS Requirement 10: The government or the regulatory body shall ensure that only justified practices are authorized

……justification of any type of practice and for review of the justification, as necessary, and
……ensure that only justified practices are authorized.

BSS Requirement 18: The government shall ensure that the use of ionizing radiation for human imaging for purposes other than medical diagnosis, medical treatment or biomedical research shall be subject to the system of protection and safety

Note:
Safety Fundamental Principle 4: Justification of facilities and activities
Facilities and activities that give rise to radiation risks must yield an overall benefit.
GSR Part 3 – Justification

- Justified practices to be subject to regulatory control
- Regulatory body to establish requirements for regulatory control
- Government is to establish dose constraints for procedures conducted using medical radiological equipment
- Requirements for public control apply to procedures for the detection of concealed objects – public dose limit
- Persons to be informed of alternative technique where available
- Equipment to meet applicable standards (e.g., IEC or ISO)
GSR Part 3 – Justification

Practices deemed not to be justified:
• deliberate addition of radioactive substances (or by activation) in food, feed, beverages, cosmetics ……..
• frivolous use of radioactive substances in commodities, toys, jewelry
• human imaging for art or publicity purposes
• human imaging for theft purposes

Exceptional circumstances for other applications considered
exceptional circumstances

- Responsibility on government
- The justification process has to consider, *inter alia*:
  - Appropriateness of the radiation equipment for the proposed use
  - The use of alternative techniques that do not utilize ionizing radiation
  - The benefits and detriments of implementing the procedure
  - The benefits and detriments of not implementing the procedure
  - Evaluation of various radiation technologies available, including the effectiveness and limitations of the procedures
  - Availability of sufficient resources to safely conduct the imaging procedure during the intended period of use
  - The impact of any legal or ethical issues which may be raised by the use of the technology
GSR Part 3 – Optimization

Irradiated persons afforded the same level of protection for:

- **Category 1**
  - As if they were undergoing a medical exposure
- **Category 2**
  - As a member of the public
Optimization – details

Category 1

- Dose constraints established for such human imaging procedures.
- The appropriate optimization requirements for medical exposures are applied, with the exception that dose constraints are to be used instead of diagnostic reference levels.

Note:

Such a dose constraint may be lower than the DRL for the “equivalent” diagnostic procedure
Revised BSS – Planned exposure situations

Optimization – details

Category 2

• The requirements for public exposure in planned exposure situations are to be met

• Optimization of protection and safety is subject to any dose constraints set by the regulatory body in consultation with other relevant authorities and professional bodies

• Person to be informed that they are about to be irradiated

• IEC standards invoked for the imaging equipment
Revised BSS – Planned exposure situations

Responsibilities

Requirement 18
The government shall ensure that the use of ionizing radiation for human imaging for purposes other than medical diagnosis, medical treatment or biomedical research is subject to the system of protection and safety.

Chapter 2; Requirement 4
Person or organization responsible for facilities and activities that give rise to radiation risks shall have prime responsibility for protection and safety. Other parties shall have specified responsibilities. Government entities not having direct responsibility for protection and safety such as ministries of health, justice, immigration and security involved.
Summary

GSR Part 3 provides a consistent and comprehensive approach to RP in the area of non-medical human imaging, based on the three radiation protection principles established by ICRP:

• Justification
• Purpose-specific optimization
• Public dose limitation, where applicable
Thank You