International Experts' Meeting on Decommissioning and Remediation after a Nuclear Accident

Organized in connection with the implementation of the IAEA Action Plan on Nuclear Safety

IAEA, Vienna International Center, Vienna, Austria, January 28th - February 1st, 2013

The International Safety Regime for Decommissioning and Remediation after a Nuclear Accident:

Lessons and Challenges from Fukushima

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Framing this Presentation
Understanding 1

The main purpose of this meeting is **to deal with the relevant radiation protection and safety framework** for tackling the huge challenges presented by the decommissioning of facilities and remediation of habitats after an accident…

….rather than resolving the technological problems.

Framing this Presentation
Understanding 2

The meeting is framed under an IAEA safety 'action plan', namely under the relevant statutory safety responsibilities of the IAEA –which are:

- **Establishing standards for the protection of health, (including those for labour conditions).**
- **Providing for their application**
- **Facilitating compliance with legally binding obligations**

Framing this Presentation

Understanding 3

The meeting was not convened for dealing with the serious problems of decommissioning and remediation linked to nuclear weapons.

This important issue will not be covered in the presentation but we would like to suggest that the IAEA may consider to convene an *ad hoc* meeting on this subject.

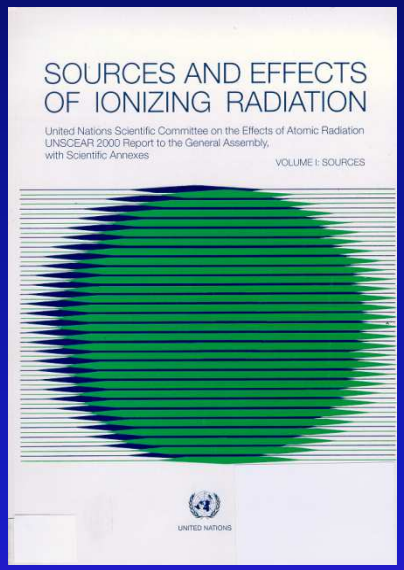
Content

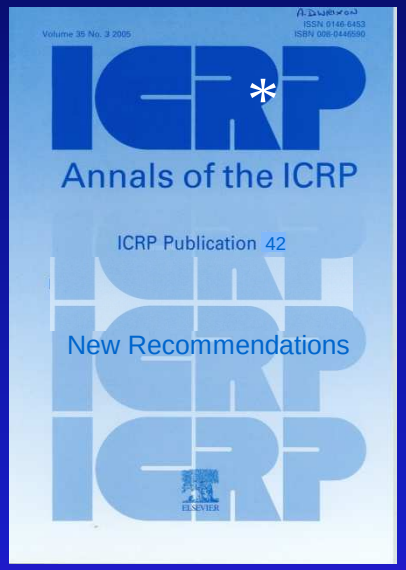
1. The international safety regime
2. Decommissioning and remediation:

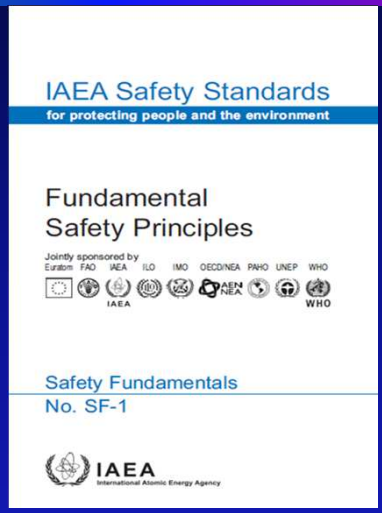
   Relevant issues
3. Lessons from Fukushima
4. Epilogue

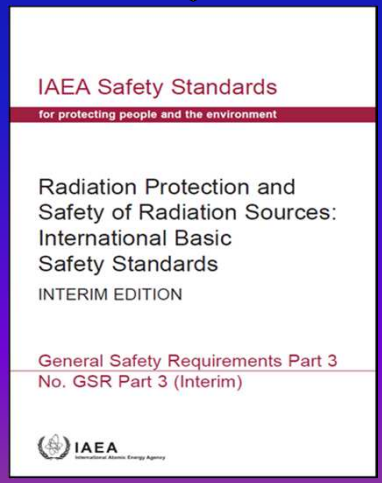
1.
The international safety regime

The international system









UNSCEAR is responsible for the epistemology

(i.e., for the scientific basis and its limitations)

Report of the United Nations Scientific Committee on the Effects of Atomic Radiation 2010

Fifty-seventh session, includes Scientific Report: summary of low-dose radiation effects on health

Rapport du Comité scientifique des Nations Unies pour l'étude des effets des rayonnements ionisants 2010

Cinquante-septième session, y compris le rapport scientifique sur les effets des rayonnements à faibles doses sur la santé

Informe del Comité Científico de las Naciones Unidas para el Estudio de los Efectos de las Radiaciones Atómicas 2010

57° período de sesiones, incluido el informe científico sobre los efectos de las radiaciones de dosis bajas en la salud

Доклад Научного комитета Организации Объединенных Наций по действию атомной радиации, 2010 год

Пятьдесят седьмая сессия; содержит научный доклад: краткое изложение проблемы воздействия радиации малых доз на состояние здоровья

联合国原子辐射影响问题科学委员会2010年报告

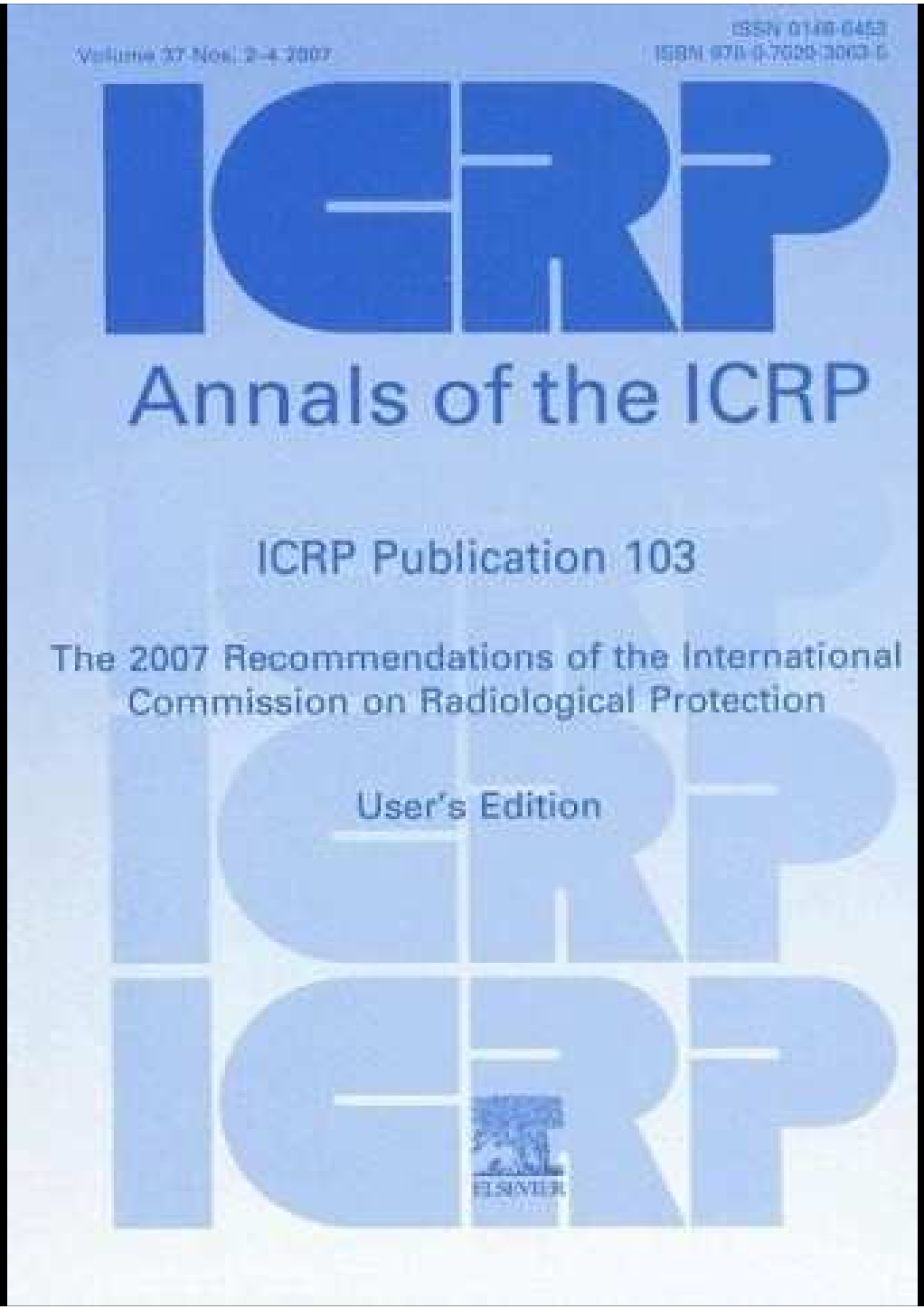
第五十七届会议，包括科学报告：低剂量辐射对健康的影响概述

تقرير لجنة الأمم المتحدة العلمية المعنية بآثار الإشعاع الذرّي ٢٠١٠

الدورة السابعة والخمسون، وهو يتضمّن التقرير العلمي: ملخّص آثار الإشعاع المنخفض الجرعات على الصحة

UNSCEAR 2010 Report

The International Commission on Radiological Protection is responsible for the paradigm


Volume 37 Nos. 2-4 2007
ISSN 0146-6453
ISBN 978-0-7020-3043-5
ICRP
Annals of the ICRP
ICRP Publication 103
The 2007 Recommendations of the International Commission on Radiological Protection
User's Edition
ELSEVIER

Volume 39 No. 1 2009
ISSN 0146-6453
ISBN 978-070-204-0986

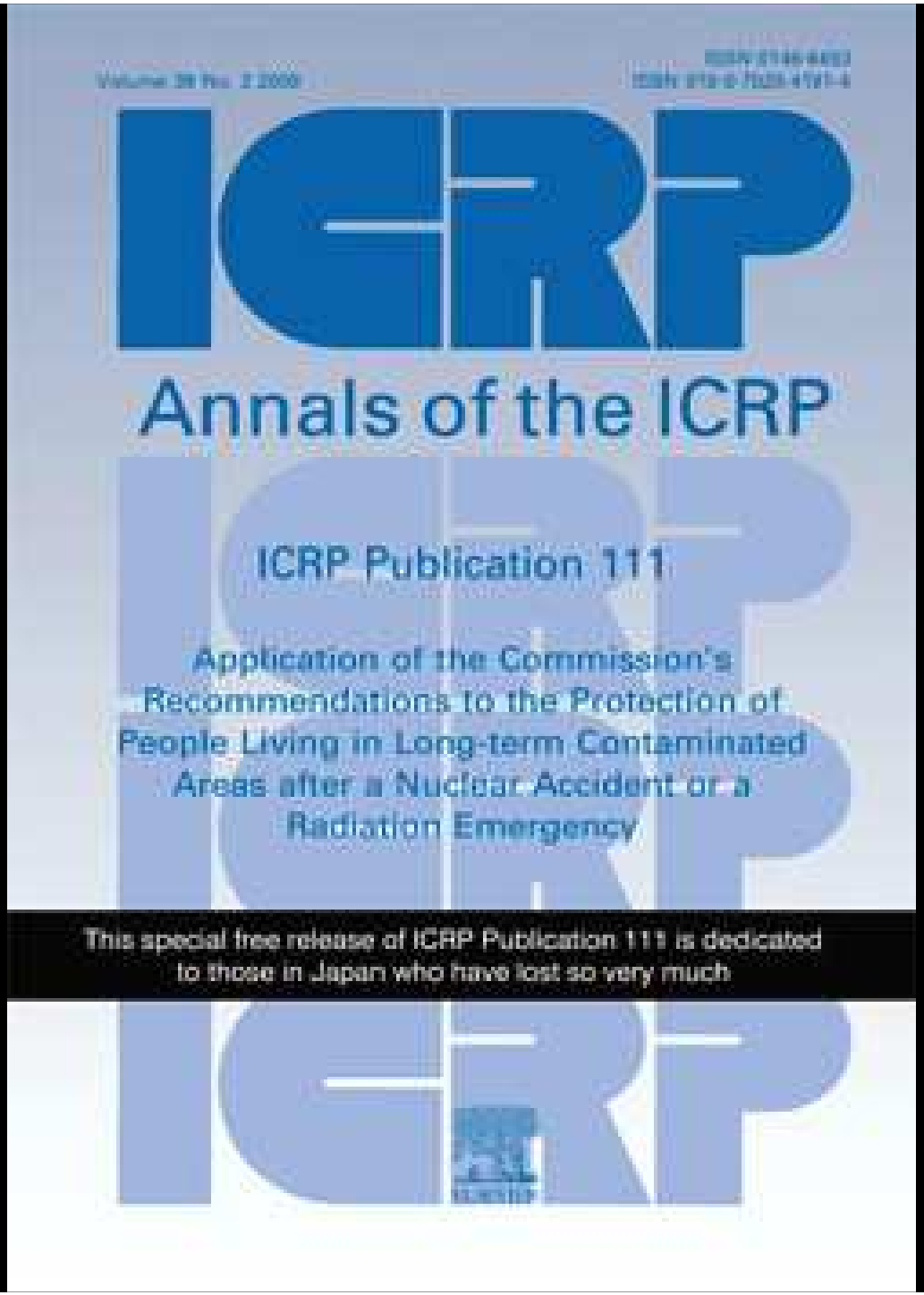
ICRP

Annals of the ICRP

ICRP Publication 109

Application of the Commission's Recommendations for the Protection of People in Emergency Exposure Situations

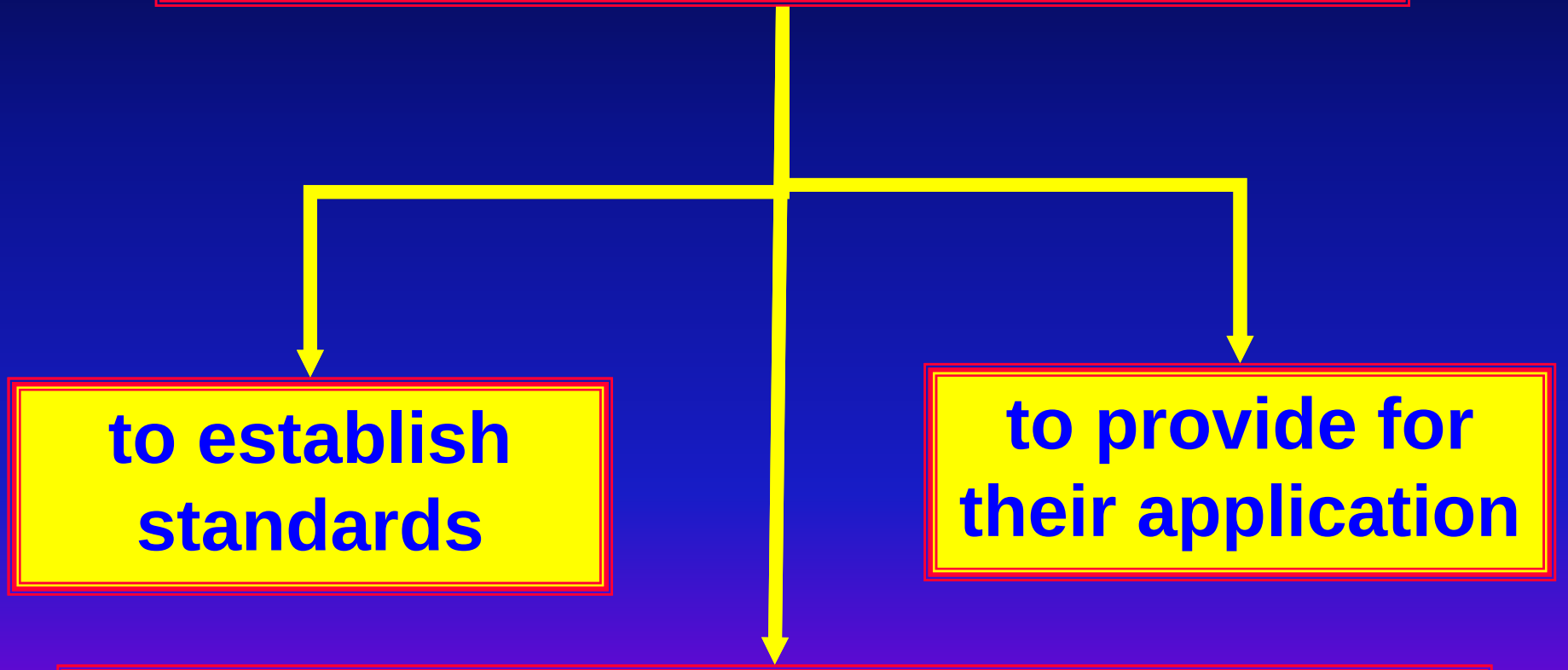
ELSEVIER


ICRP
Annals of the ICRP
ICRP Publication 111
Application of the Commission's Recommendations to the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency
This special free release of ICRP Publication 111 is dedicated to those in Japan who have lost so very much

The IAEA is responsible for the global regime of intergovernmental obligations and standards

IAEA statutory functions

related to decommissioning and remediation



Legally Binding Conventions

- Convention on Early Notification of a Nuclear Accident
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

ILO Radiation Protection Convention No. 115 (1960)

ILO Radiation Protection Convention No. 115 (1960)

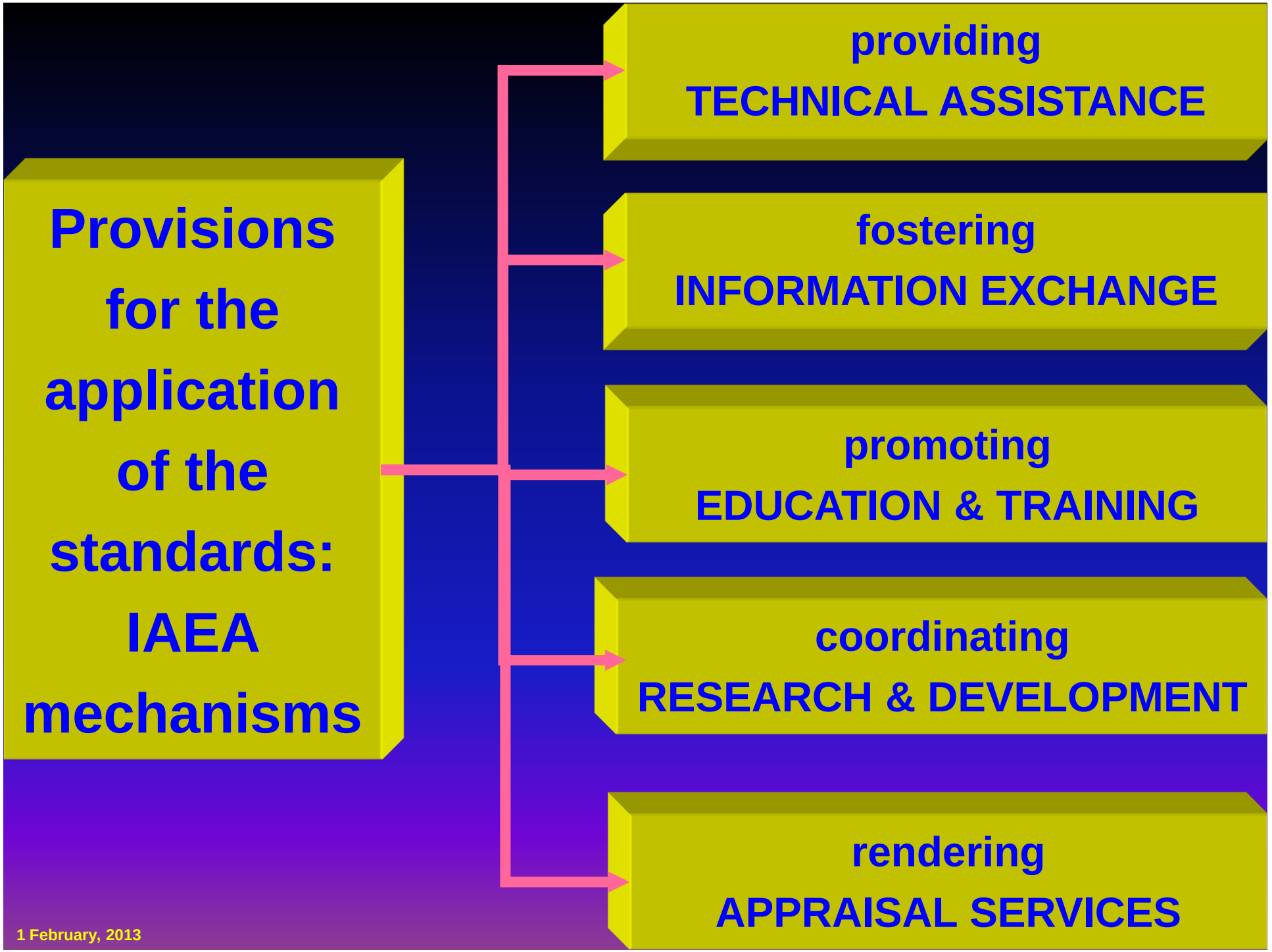
Date of entry into force: 17.6.1962

Ratifications:

- Argentina 15.6.1978
- Azerbaijan 19.5.1992
- Barbados 8.5.1967
- Belarus 26.2.1968
- Belgium2.7.1965
- Beliz 15.12.1983
- Brazil 5.9.1966
- Chile 14.10.1994
- Czech Rep. 1.1.1993
- Denmark 7.2.1974
- Djibouti 3.8.1978
- Ecuador 9.3.1970
- Egypt 18.3.1964
- Finland 16.10.1978
- France 18.11.1971
- Germany 26.9.1973
- Ghana 7.11.1961
- Greece 4.6.1982
- Guinea 12.12.1966
- Guyana 8.6.1966
- Hungary 8.6.1968
- India 17.11.1975
- Iraq 26.10.1962
- Italy 5.5.1971
- **Japan 31.7.1973**
- Kyrgyzstan 31.3.1992
- Latvia 8.3.1993
- Lebanon 6.12.1977
- Luxembourg 8.4.2008
- Mexico 19.10.1983
- Netherlands 29.11.1966
- Nicaragua 1.10.1981
- Norway 17.6.1961
- Paraguay 10.7.1967
- Poland 23.12.1964
- Portugal 17.3.1994
- Russian Fed. 22.9.1967
- Slovakia 1.1.1993
- Spain 17.7.1962
- Sri Lanka 18.6.1986
- Sweden 12.4.1961
- Switzerland 29.5.1963
- Syrian A. R. 15.1.1964
- Tajikistan 26.11.1993
- Turkey 15.11.1968
- Ukraine 19.6.1968
- U.K. 9.3.1962
- Uruguay 22.9.1992

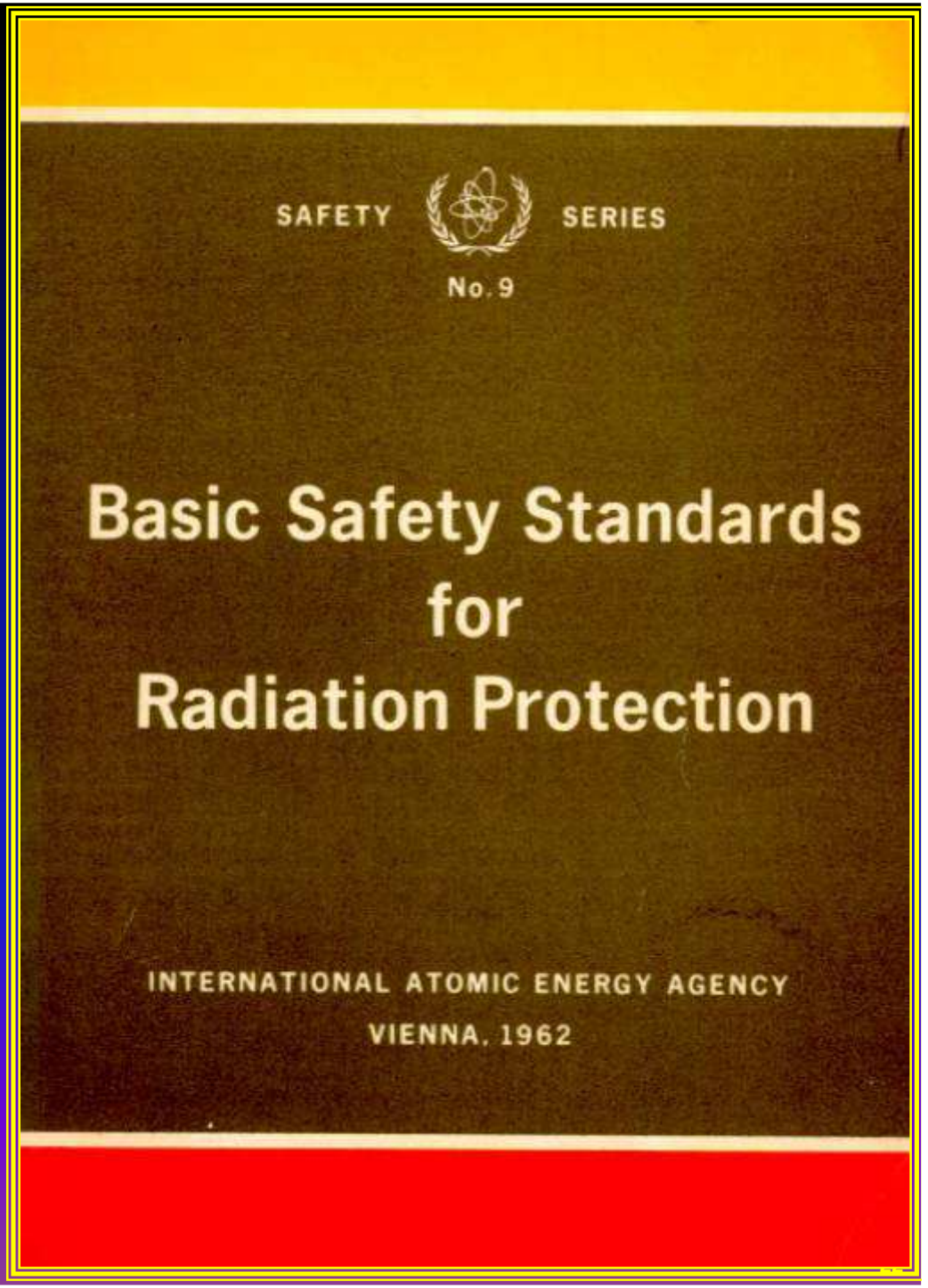
International Radiation Safety Standards


IAEA Board of Governors
Commission on Safety Standards (CSS)
Nuclear Safety Standards Committee (NUSSC)
Radiation Safety Standards Committee (RASSC)
Waste Safety Standards Committee (WASSC)
Transport Safety Standards Committee (TRANSSC)
Expert Groups
Expert Groups
Expert Groups
Expert Groups


Provisions for the application of the standards: IAEA mechanisms
providing TECHNICAL ASSISTANCE
fostering INFORMATION EXCHANGE
promoting EDUCATION & TRAINING
coordinating RESEARCH & DEVELOPMENT
rendering APPRAISAL SERVICES

Long experience

1962: first international standards.

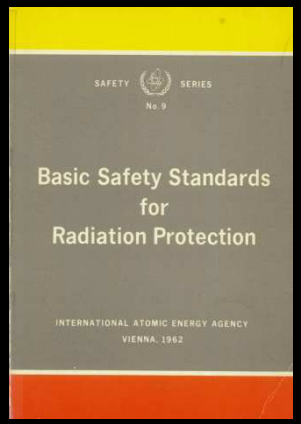


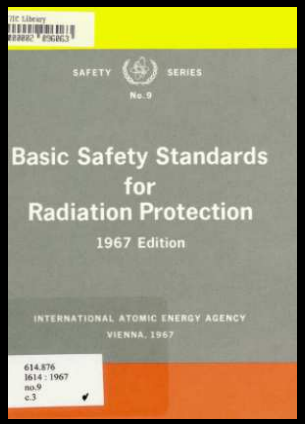
ICRP recommendations

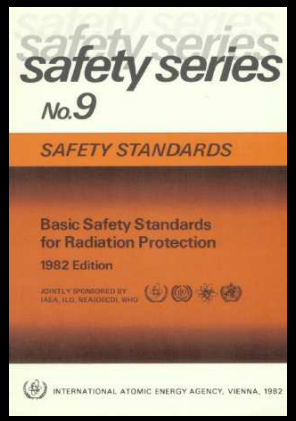
- 1958 (“Publication 1”)
- 1966 (Publication 9)
- 1977 (Publication 26)
- 1990 (Publication 60)
- 2007 (Publication 103)

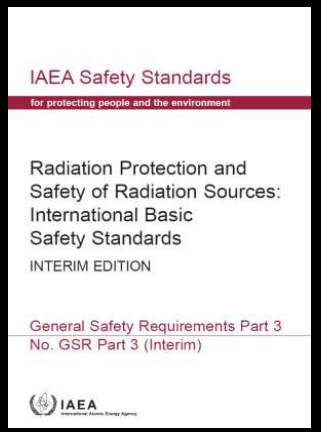
IAEA Basic Safety Standards

- 1962
- 1967
- 1982
- 1996
- 2011 – Interim edition

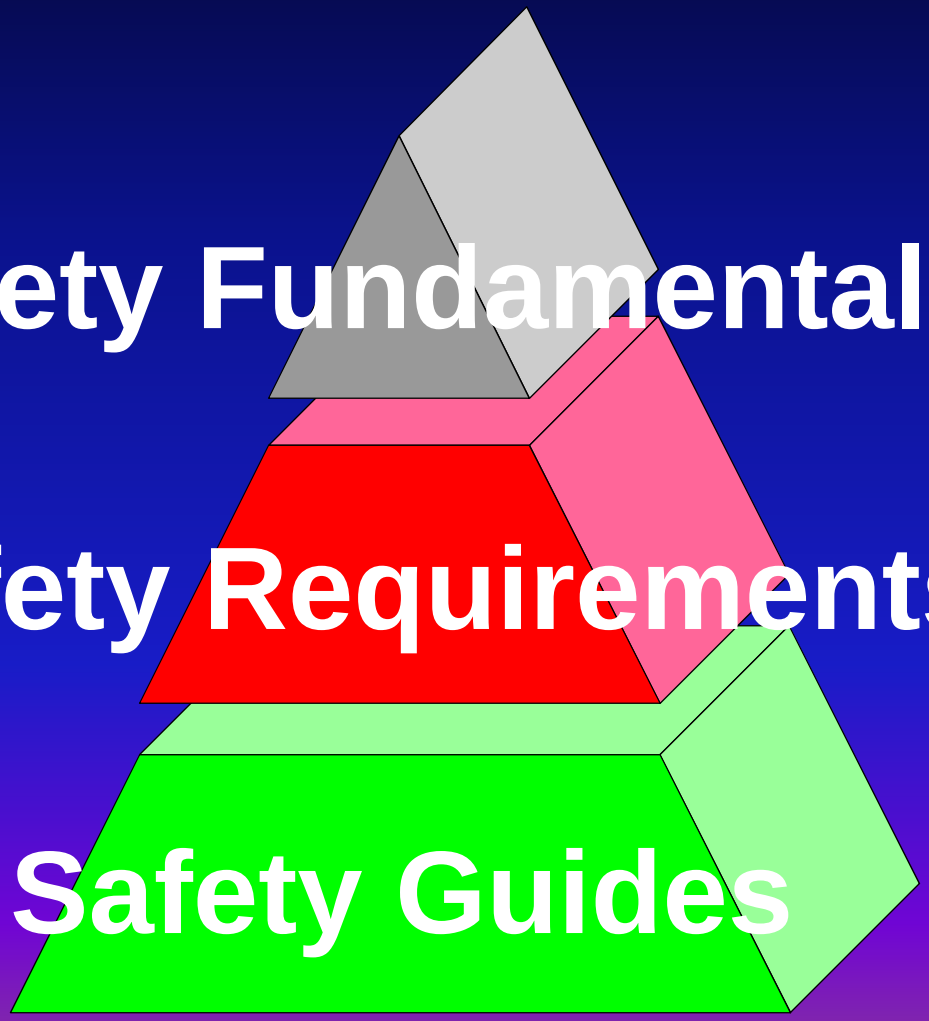








Safety Standards Hierarchy



IAEA Safety Standards

for protecting people and the environment

Fundamental Safety Principles

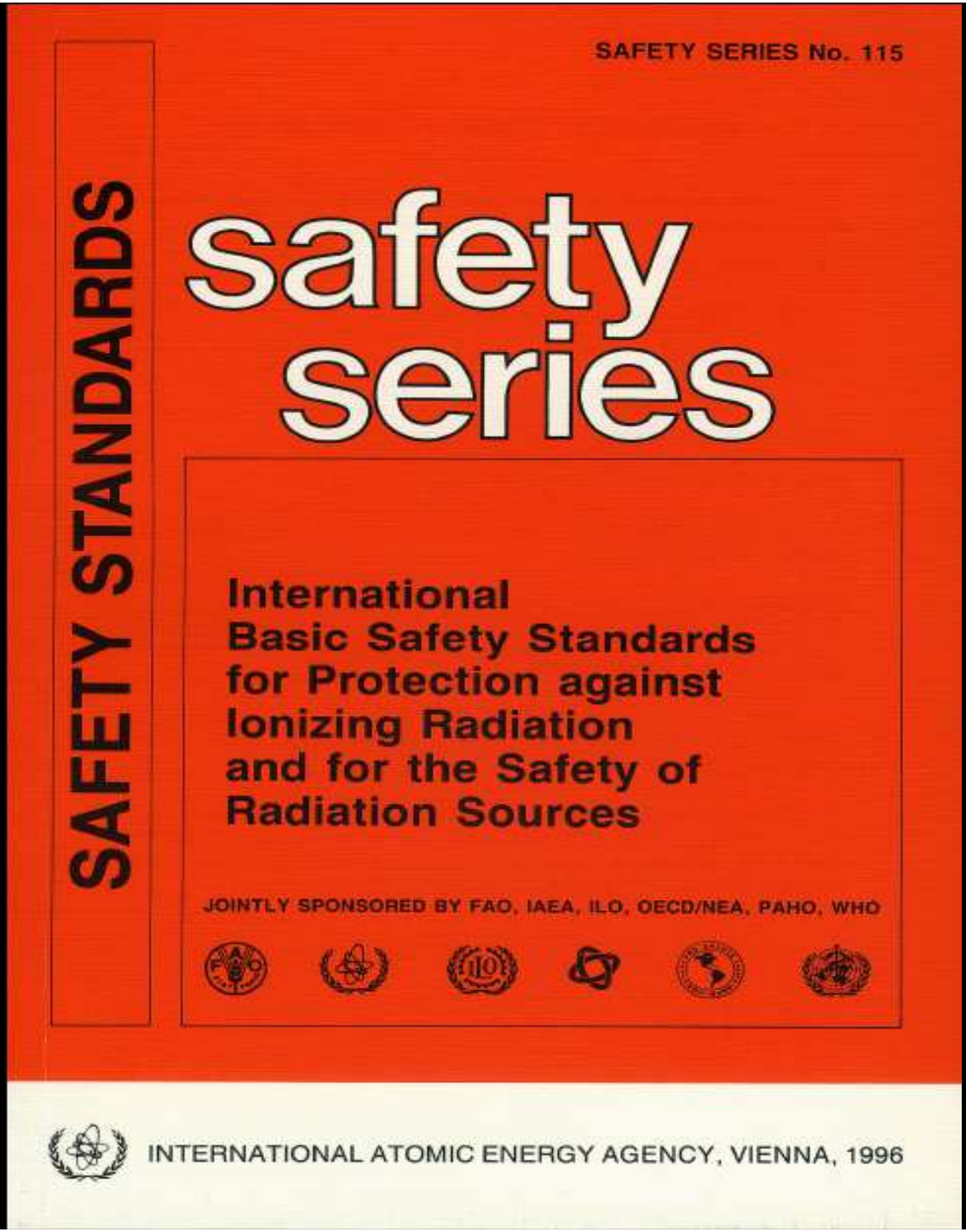
Jointly sponsored by

Euratom FAO IAEA ILO IMO OECD/NEA PAHO UNEP WHO

Safety Fundamentals

No. SF-1

IAEA
International Atomic Energy Agency


SAFETY SERIES No. 115
SAFETY STANDARDS
safety series
International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources
JOINTLY SPONSORED BY FAO, IAEA, ILO, OECD/NEA, PAHO, WHO
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, 1996

IAEA Safety Standards

for protecting people and the environment

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

INTERIM EDITION

General Safety Requirements Part 3

No. GSR Part 3 (Interim)

IAEA
International Atomic Energy Agency

IAEA
SAFETY
STANDARDS
SERIES

Application of the Concepts of Exclusion, Exemption and Clearance

SAFETY GUIDE

No. RS-G-1.7

IAEA
International Atomic Energy Agency

IAEA Safety Standards

for protecting people and the environment

Decommissioning of Facilities Using Radioactive Material

Safety Requirements

No. WS-R-5

IAEA
International Atomic Energy Agency

IAEA
SAFETY
STANDARDS
SERIES

Decommissioning of Nuclear Power Plants and Research Reactors

SAFETY GUIDE

No. WS-G-2.1

INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA

IAEA Safety Standards

for protecting people and the environment

Safety Assessment for the Decommissioning of Facilities Using Radioactive Material

Safety Guide

No. WS-G-5.2

IAEA
International Atomic Energy Agency

IAEA
SAFETY
STANDARDS
SERIES

Occupational Radiation Protection

JOINTLY SPONSORED BY THE
INTERNATIONAL ATOMIC ENERGY AGENCY AND THE
INTERNATIONAL LABOUR OFFICE

SAFETY GUIDE

No. RS-G-1.1

INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA

IAEA Safety Standards

for protecting people and the environment

Release of Sites from Regulatory Control on Termination of Practices

Safety Guide

No. WS-G-5.1

IAEA

International Atomic Energy Agency

IAEA
SAFETY
STANDARDS
SERIES

Remediation of Areas Contaminated by Past Activities and Accidents

SAFETY REQUIREMENTS

No. WS-R-3

IAEA
International Atomic Energy Agency

IAEA Safety Standards

for protecting people and the environment

Remediation Process for Areas Affected by Past Activities and Accidents

Safety Guide

No. WS-G-3.1

IAEA

International Atomic Energy Agency

IAEA Safety Standards

for protecting people and the environment

Environmental and Source Monitoring for Purposes of Radiation Protection

Safety Guide

No. RS-G-1.8

IAEA
International Atomic Energy Agency


SAFE DECOMMISSIONING
FOR NUCLEAR ACTIVITIES
Proceedings of an International Conference
Berlin, 14–18 October 2002
IAEA
International Atomic Energy Agency

PROCEEDINGS SERIES

LESSONS LEARNED FROM THE DECOMMISSIONING OF NUCLEAR FACILITIES AND THE SAFE TERMINATION OF NUCLEAR ACTIVITIES

PROCEEDINGS OF AN INTERNATIONAL CONFERENCE ON
LESSONS LEARNED FROM THE DECOMMISSIONING
OF NUCLEAR FACILITIES AND THE
SAFE TERMINATION OF NUCLEAR ACTIVITIES
ORGANIZED BY THE
INTERNATIONAL ATOMIC ENERGY AGENCY,
CO-SPONSORED BY THE EUROPEAN COMMISSION,
IN COOPERATION WITH THE
OECD NUCLEAR ENERGY AGENCY AND THE
WORLD NUCLEAR ASSOCIATION,
HOSTED BY THE GOVERNMENT OF GREECE
THROUGH THE MINISTRY OF FOREIGN AFFAIRS
OF THE HELLENIC REPUBLIC
AND THE GREEK ATOMIC ENERGY COMMISSION
AND HELD IN ATHENS, 11–15 DECEMBER 2006

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2007

International Conference on Remediation of Land Contaminated by Radioactive Material Residues

18–22 May 2009
Astana, Kazakhstan

Organized by the
International Atomic Energy Agency (IAEA)

Hosted by the
Government of Kazakhstan

IAEA
International Atomic Energy Agency
Atoms for Peace

http://www-pub.iaea.org/MTCD/Announcement.asp?ConfID=35422

CN–172

Does this comprehensive international regime provide solutions to the concrete practical issues of decommissioning and remediation?

2.
Relevant Issues

Decommissioning

The main safety issues in decommissioning are

- Providing occupational protection
- Managing the radioactive waste
- Dealing with the ‘contaminated’ rubble
- Remediating the ‘contaminated’ site

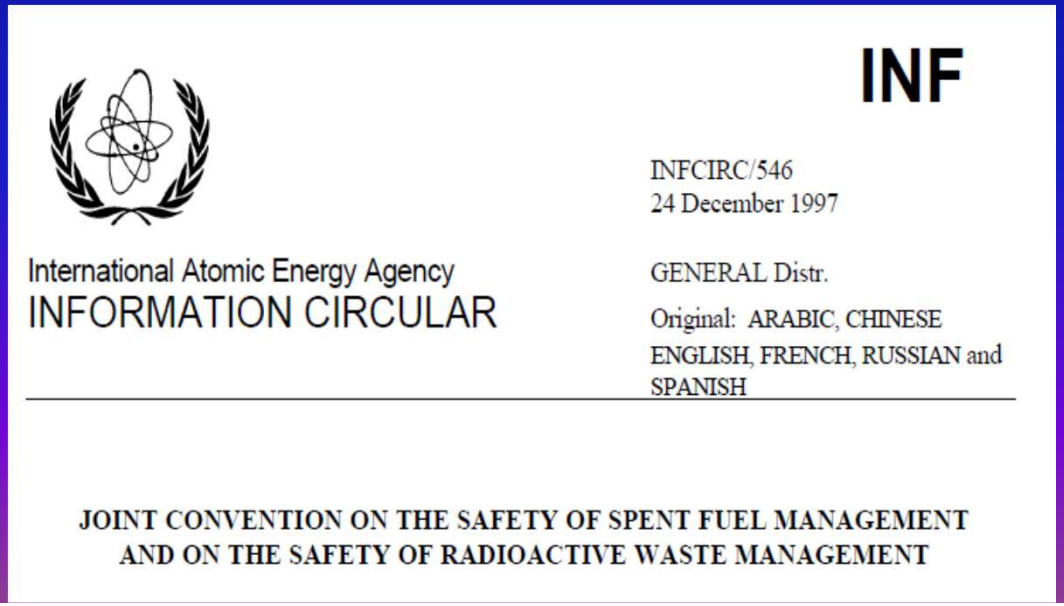
Occupational Protection

- Legally binding instruments already exist.
- States shall comply with their obligations.

ILO Radiation Protection Convention No. 115 (1960)

Management of Radioactive Waste

- Legally binding instruments already exist.
- States shall comply with their obligations.



INF

INFCIRC/546
24 December 1997

International Atomic Energy Agency
INFORMATION CIRCULAR

GENERAL Distr.
Original: ARABIC, CHINESE
ENGLISH, FRENCH, RUSSIAN and
SPANISH

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT
AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

Unsolved issues

- Dealing with the ‘contaminated’ rubble
- Remediating the ‘contaminated’ site

Remediation

Terminology

Remediation

- providing a *remedy*?

  (pharmaceutical product, cure or treatment)

- '*cleanup*' (making a place 'clean')?;
- removing 'contamination' from land?, or
- reducing radiation exposure?…
- how much?

Aim

The aim of international policies on remediation should be to resolve unambiguously elementary questions being asked by the public


Is it safe for me
and my family
to live here?

Can we play on the outdoor area?


Is it safe for me and my family to eat this food?

These kakis (persimmons) contain 90 Bq/kg, but when dried they contain 110;

are they edible?

Is it safe?

The Minister does not drink water from the Fukushima Prefecture every day!

This water is safe; I drunk it!

Deputy Minister Yasuhiro Sonoda


If water is not safe, why is orange juice safe?


Why I am permitted to drink this water but not to swim in it?


Are these rice-paper room-divider screens safe?


This patient shows some contamination, should I send her to Chiba?

We were told this water is contaminated; shall we use it?

- Does the current international regime of

have an unambiguous answer to these questions?

- It seems that it doesn’t

I seems that even climbing this mountain will not solve the problem of 'contamination' ?

- **Well, if the system cannot answer unambiguously these straightforward questions, then something is wrong!**

Limiting the solution of this serious problem to the involvement of '*stakeholders*', and then giving the question back to them, is unfair and, *somehow*,

ethically incorrect.

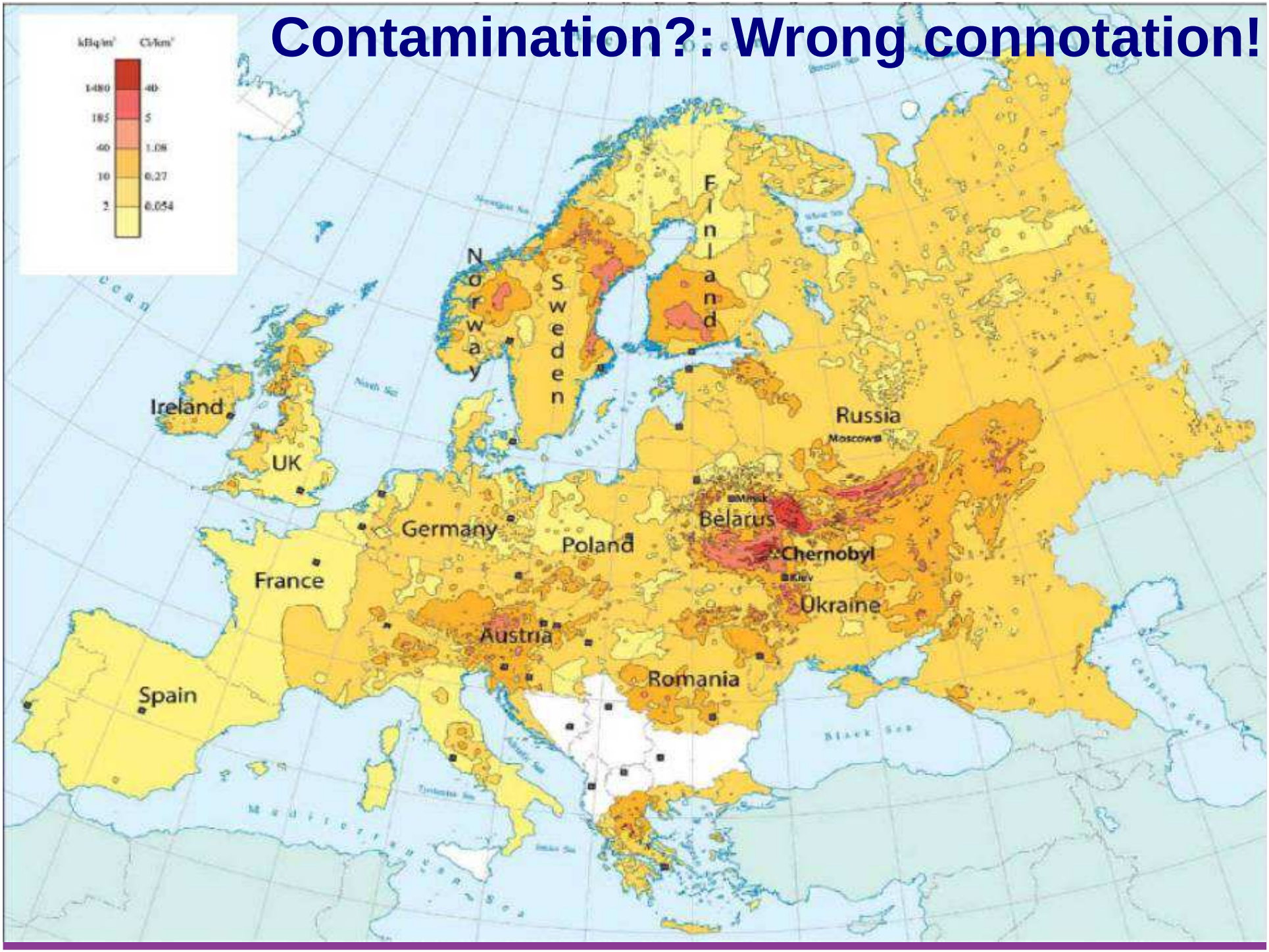
‘*Contamination*’

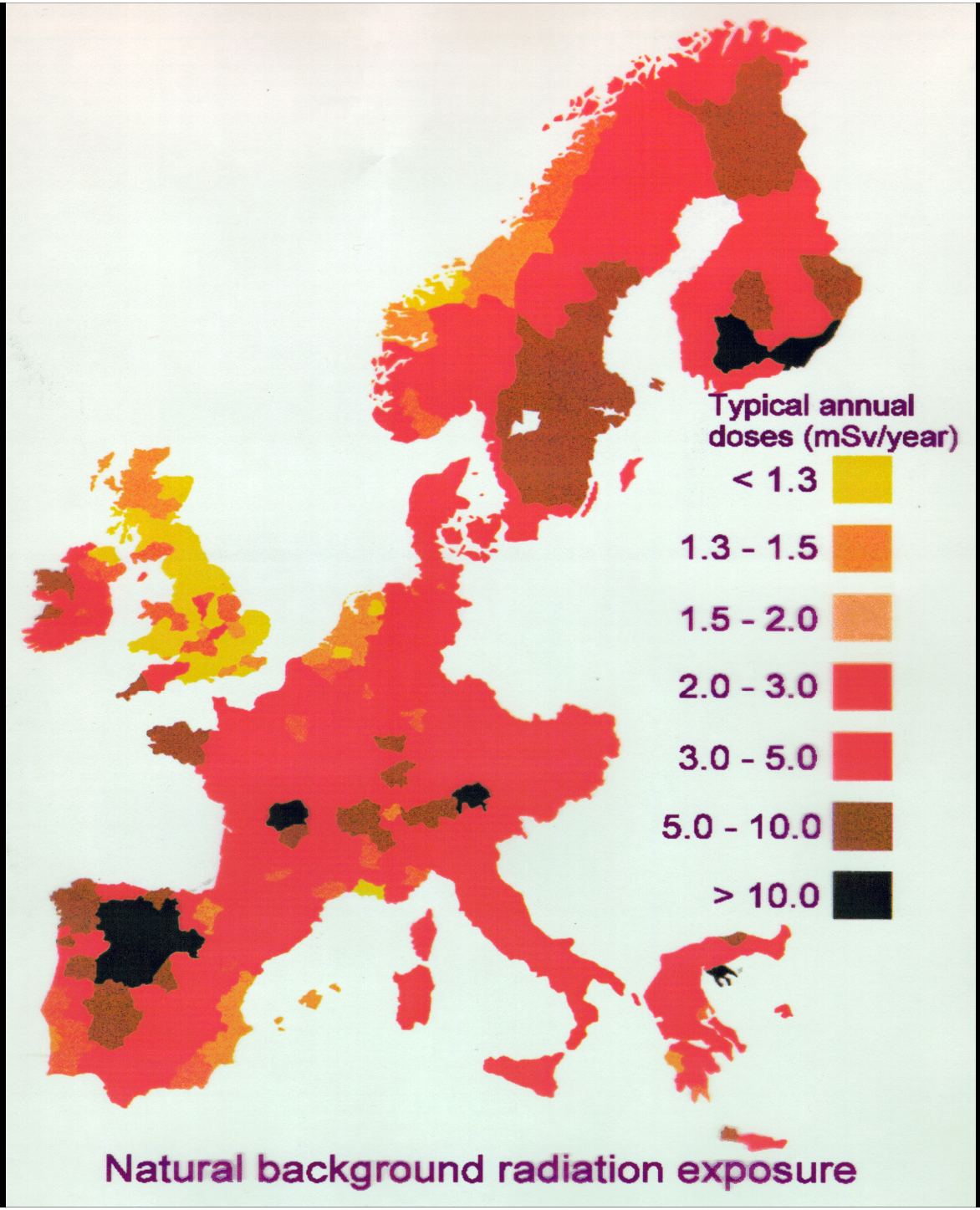
- from Latin ***contaminare***, ‘make impure’.
- Religious understanding (e.g., no-kosher food)
- Experts’ denotation: presence of radioactivity
- Public’s connotation: danger of radiation


The food is ‘contaminated’, but do not worry the ‘contamination’ is low?

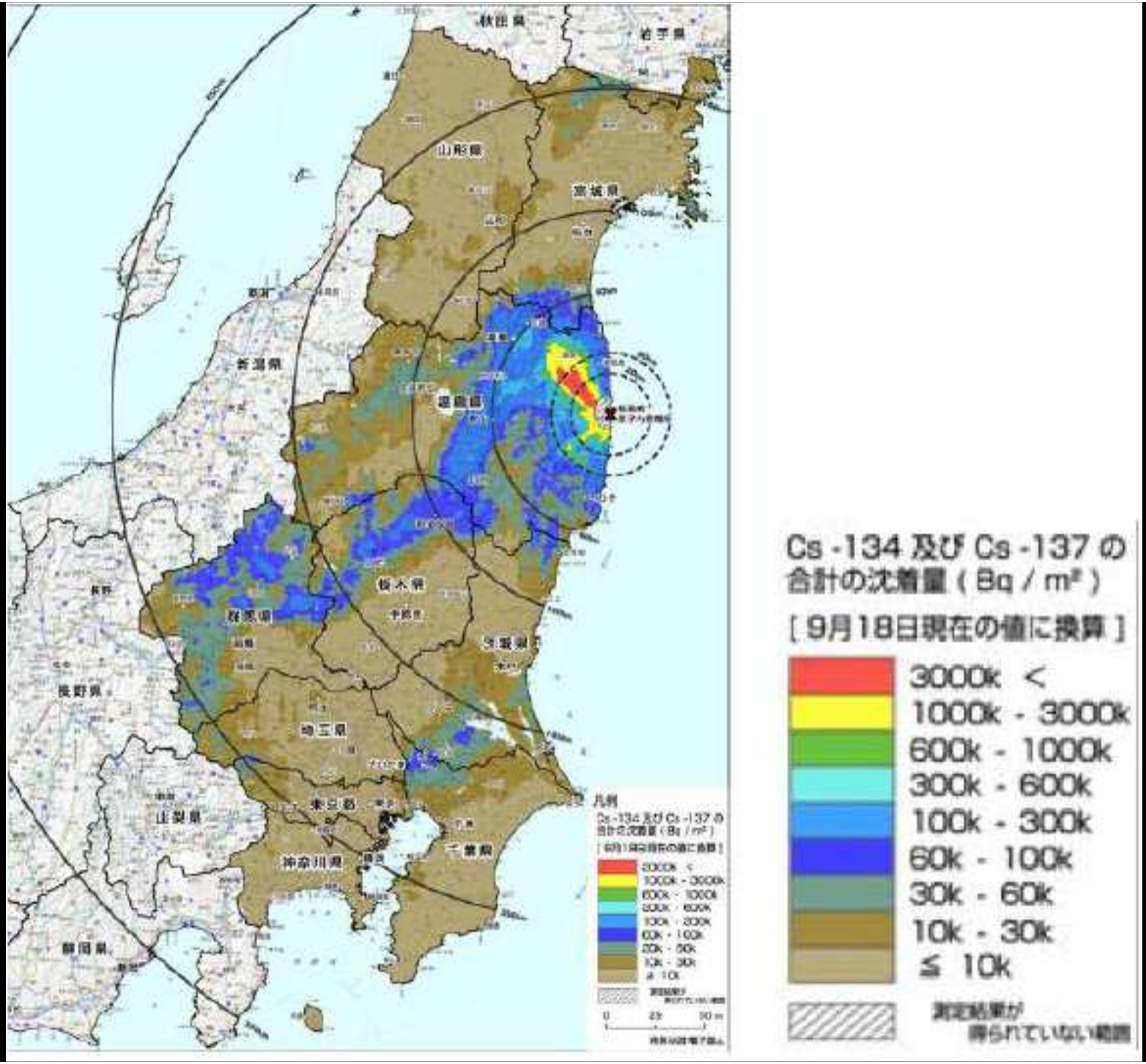
'Contaminated' Territories

Contamination?: Wrong connotation!





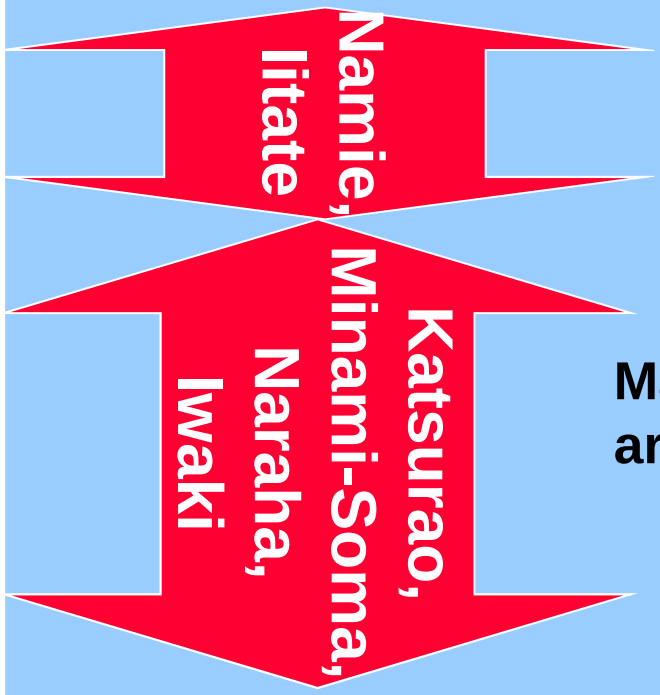
Natural background radiation exposure


秋田県
岩手県
山形県
宮城県
新潟県
福島県
栃木県
群馬県
茨城県
長野県
埼玉県
東京都
千葉県
山梨県
神奈川県
静岡県
凡例
Cs -134 及び Cs -137 の
合計の沈着量 (Bq / m²)
[9月18日現在の値に換算]
3000k <
1000k - 3000k
600k - 1000k
300k - 600k
100k - 300k
60k - 100k
30k - 60k
10k - 30k
≦ 10k
測定結果が
得られていない範囲

What is the meaning of ‘contaminated’ land?

Natural Background

annual dose
mSv/year



Few people
In few areas ⇒ ~100

VERY HIGH

Many people
In many areas ⇒ ~ 10

TYPICALLY HIGH

Majority of people
around the world ⇒ ~ 2.4

AVERAGE

~ 1

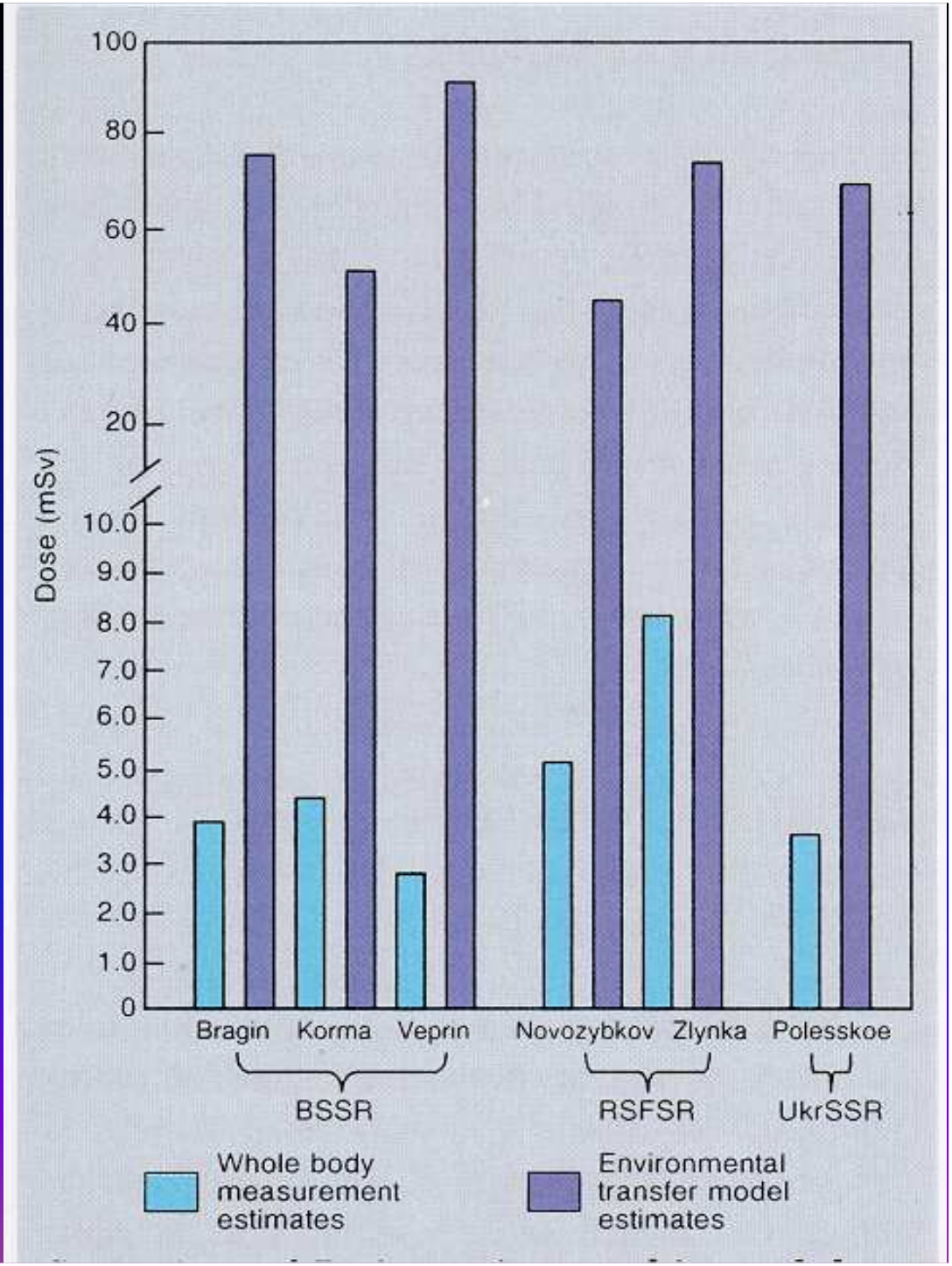
MINIMUM

Preliminary dose estimation

from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami

World Health Organization

In Chernobyl, radiation doses measured *in vivo* were much lower than those estimated theoretically.



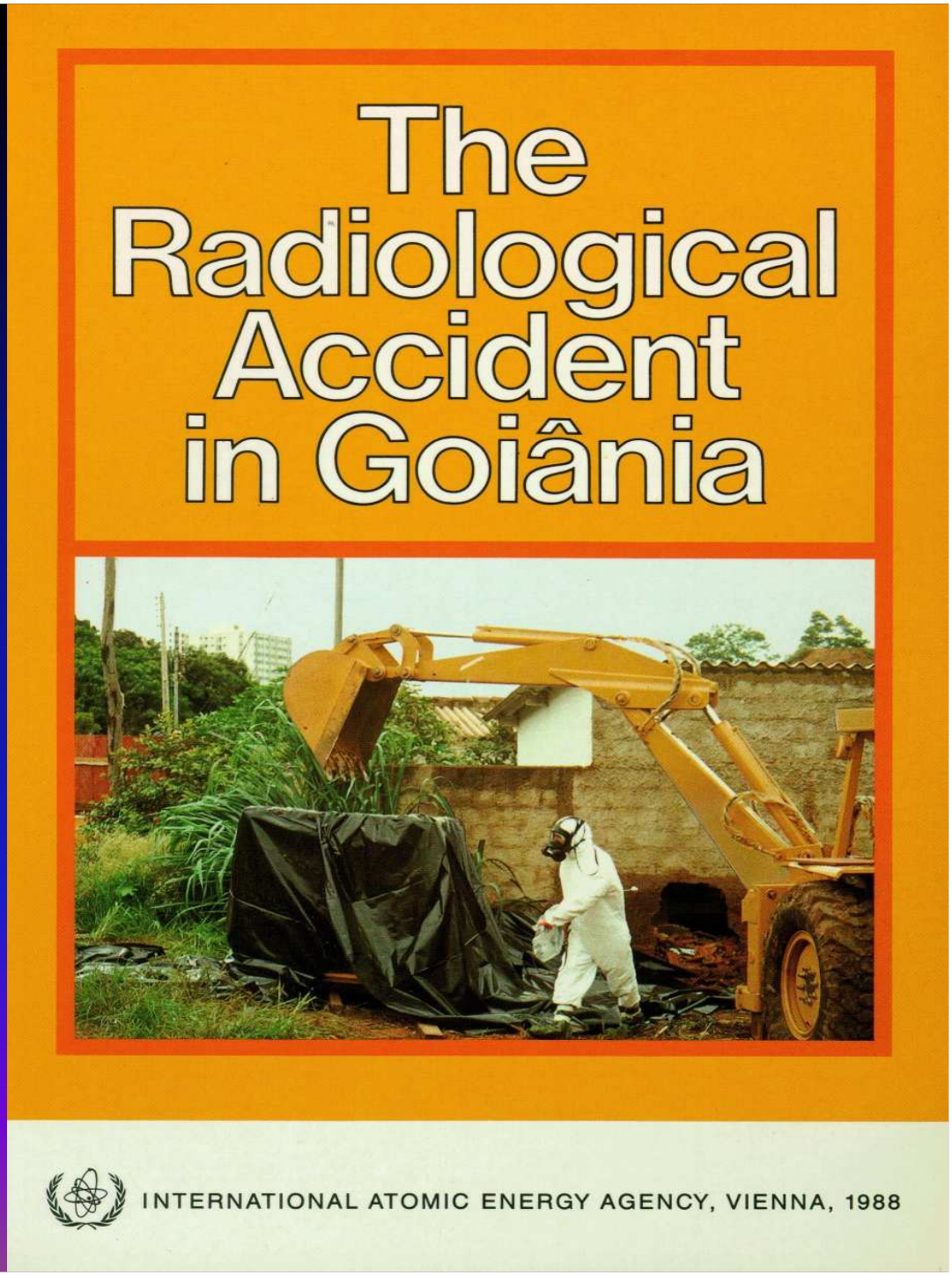
How to ‘remediate’ ‘contaminated’ land

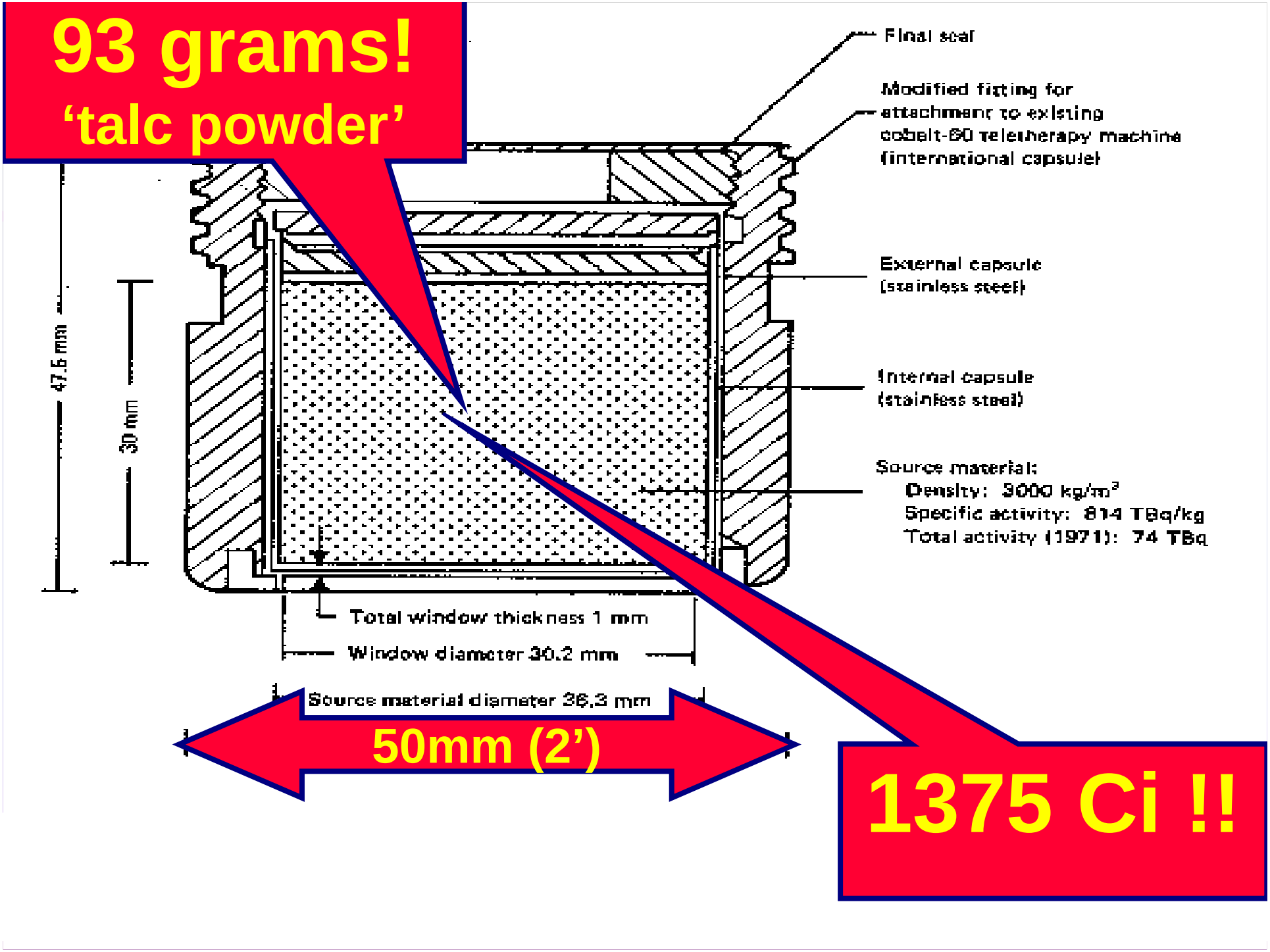
- Exempting?
- Controlling minute radioactivity?
- Mixing the soil?
- Scraping?


What are they going to do with all this?

‘*Contaminated*’ Rubble

Example


The Radiological Accident in Goiânia
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, 1988


93 grams!
'talc powder'
Final seal
Modified fitting for attachment to existing cobalt-60 teletherapy machine (international capsule)
External capsule (stainless steel)
Internal capsule (stainless steel)
Source material:
Density: 3000 kg/m³
Specific activity: 814 TBq/kg
Total activity (1971): 74 TBq
47.5 mm
30 mm
Total window thickness 1 mm
Window diameter 30.2 mm
Source material diameter 36.3 mm
50mm (2')
1375 Ci !!

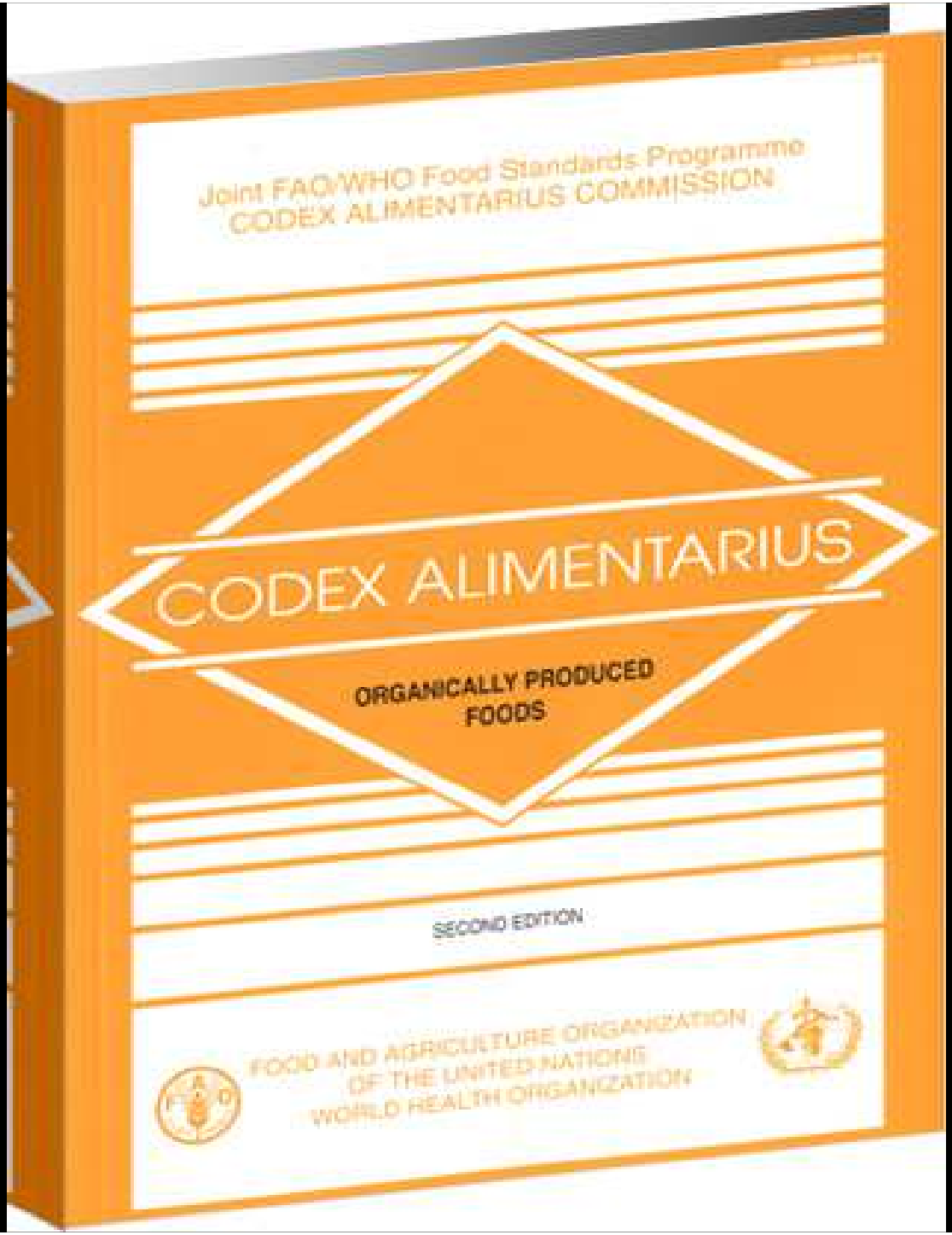
5,000 m3 of ‘contaminated’ rubble


Shall I put this waste in the truck or shall I phone the radioactive waste management group?
作業中
LPガス車
染谷商店
吉川ビル
楽栄
エルム

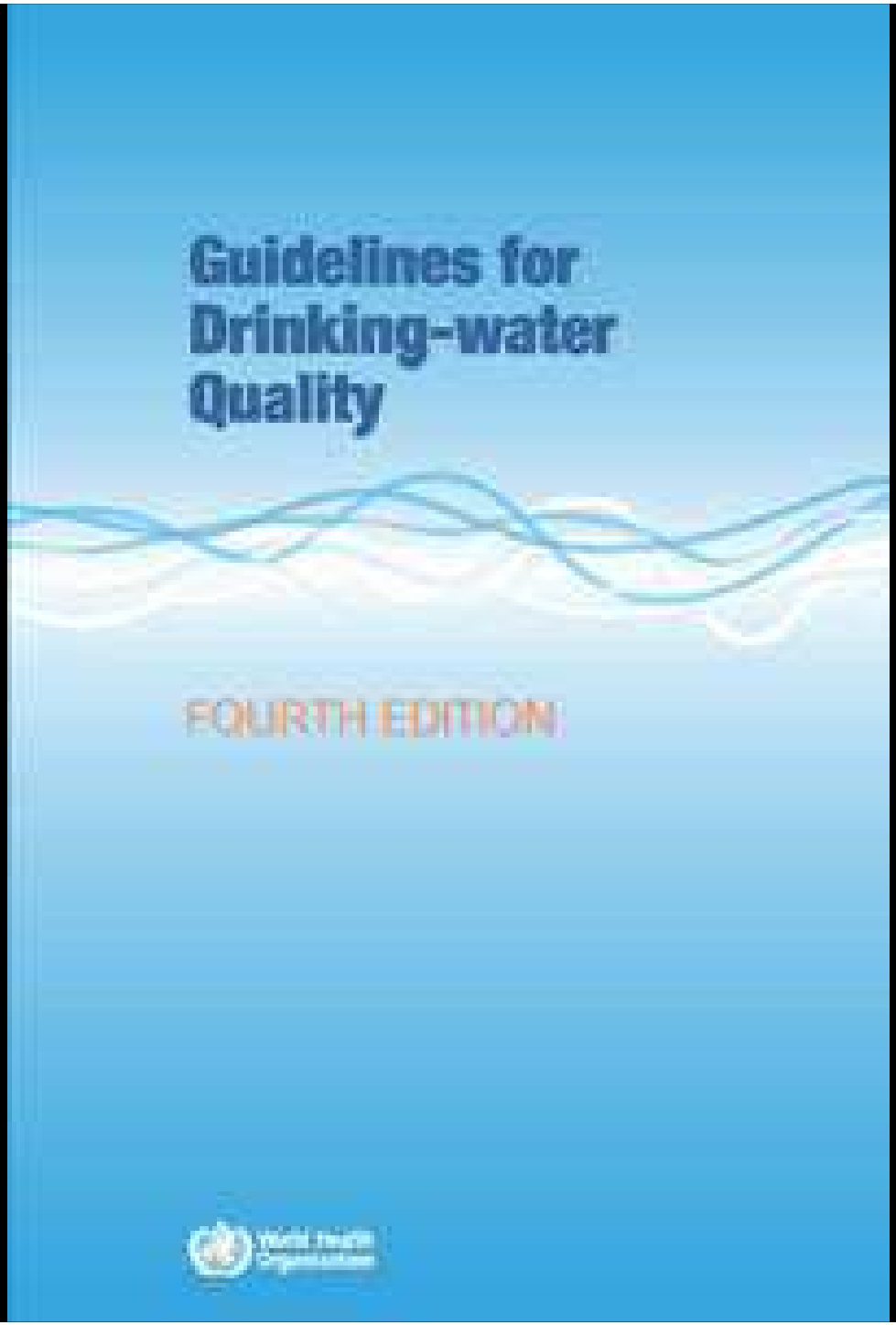
‘*Contaminated*’ Consumer Products

- The control of acceptable levels of radioactivity in consumer products is not straightforward
- Some international intergovernmental agreements exist but they are incoherent and inconsistent.

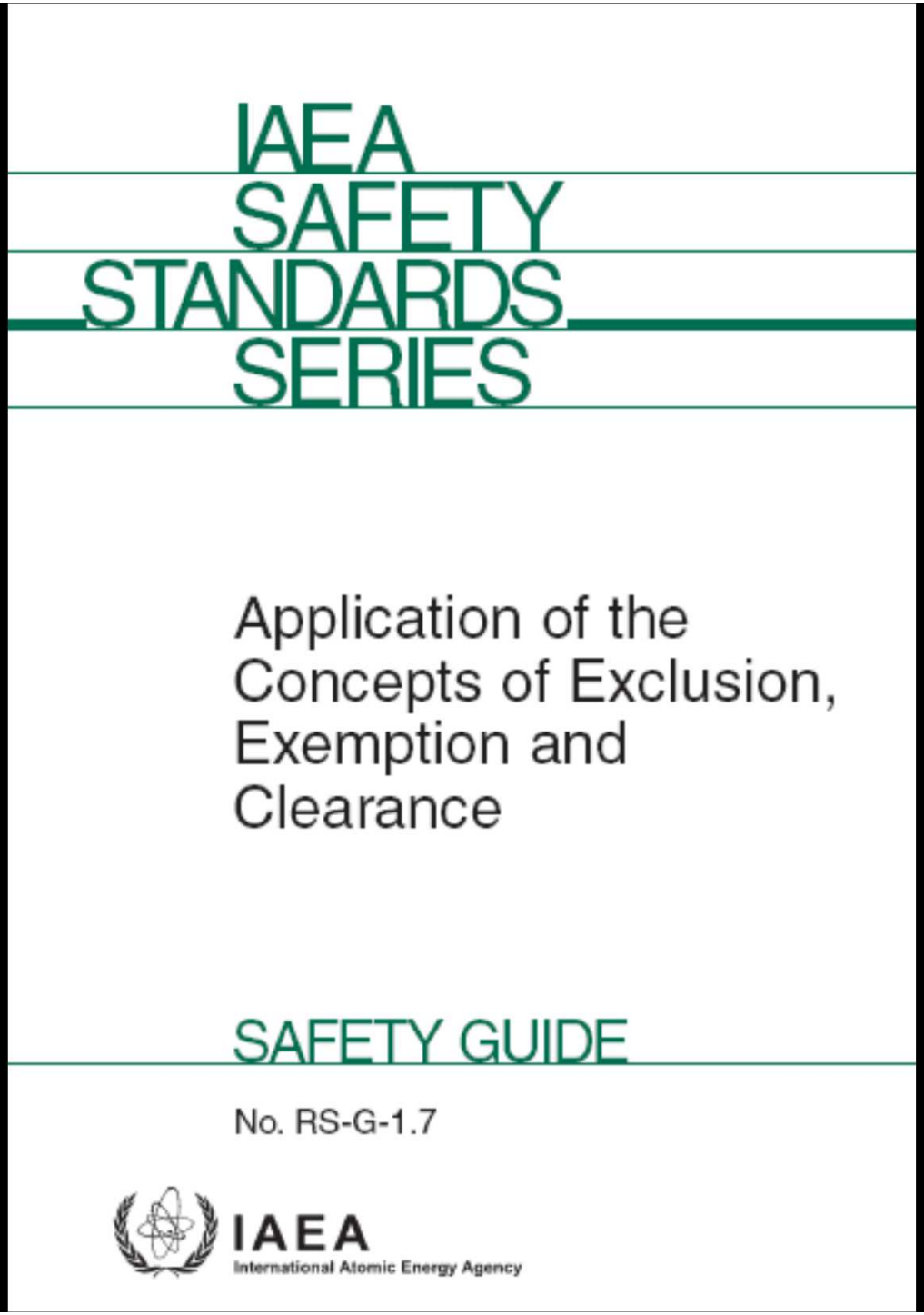
Foodstuff


Joint FAO/WHO Food Standards Programme
CODEX ALIMENTARIUS COMMISSION
CODEX ALIMENTARIUS
ORGANICALLY PRODUCED FOODS
SECOND EDITION
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
WORLD HEALTH ORGANIZATION

Water

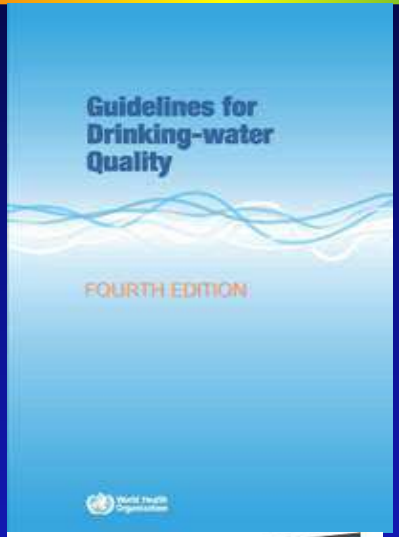


Non edible


IAEA
SAFETY
STANDARDS
SERIES
Application of the Concepts of Exclusion, Exemption and Clearance
SAFETY GUIDE
No. RS-G-1.7
IAEA
International Atomic Energy Agency

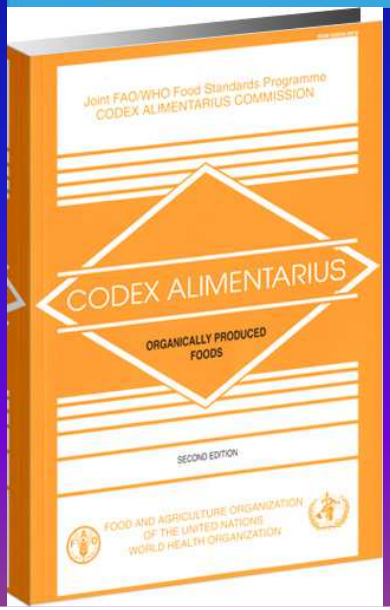
Incoherence in drinking liquids

+



= 10 Bq/l for ^{137}Cs

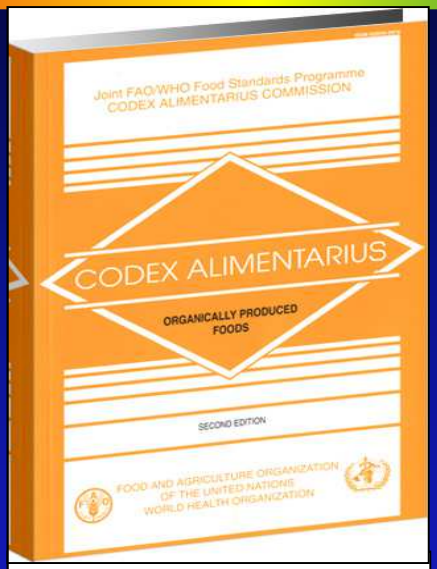
+



= 1000 Bq/l for ^{137}Cs

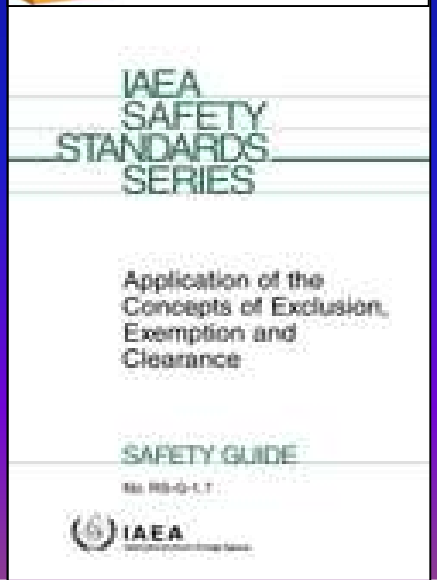
Incoherence in non-edible vs. edible

+



= 1000 Bq/kg for ^{137}Cs

+



= 100 Bq/kg for ^{137}Cs

Guidance values in Japan

Guideline values for food and drink intake restrictions

(Nuclear Safety Commission)

	Radioactive Iodine(^{131}I)	Radioactive Cesium	Uranium	Total of ^{238}Pu, ^{239}Pu,^{240}Pu,^{242}Pu ,^{241}Am,^{242}Cm,^{243} Cm,^{244}Cm
Drinking water	> $3x10^2$Bq/kg	> $2x10^2$Bq/kg	> 20Bq/kg	> 1Bq/kg
Milk, dairy products				
Vegetables and fruits	> $2x10^3$Bq/kg (excluding root vegetables and potatos)	> $5x10^2$Bq/kg	> $1x10^2$Bq/kg	> 10 Bq/kg
Grains	-			
Meat, Egg, Fish, etc				

New radiation limits for food in Japan

- On 22 December 2011 the Japanese government announced new limits for cæsium in food.

  (The new norms were enforced in April 2012).

- Rice, meat, vegetables, fish: **100 Bq/Kg** (500 Bq/Kg),
- Milk, milk-powder, infant-food: **50 Bq/Kg** (200 Bq/Kg)
- Drinking water: **10 Bq/Kg** (200 Bq/Kg)

lanacion.com

Martes 22 de enero de 2013 | 16:21

Japón: encuentran un pez con 2500 veces el nivel legal de radiactividad

Fue hallado cerca de la central nuclear accidentada de Fukushima durante 2011 por un terremoto y posterior tsunami

TOKIO.- Un pez atrapado con la finalidad de realizar un control cerca de la central nuclear accidentada de Fukushima presenta un nivel impresionante de contaminación radioactiva, casi 2.500 veces superior al límite legal fijado por Japón, anunció el viernes el operador de esta instalación atómica.

La compañía Tokyo Electric Power (TEPCO) declaró que midió en un pez llamado "murasoi" una cantidad de cesio radioactivo igual a 254.000 becquereles por kilo, o sea 2.540 veces el límite de 100 becquereles/kg definida para los productos marinos por el gobierno.

Japan: find a fish with 2500 times the legal level of radioactivity.

La Nación, Buenos Aires, Tuesday, January 23rd, 2013

Deceit!

- Highly ‘contaminated’ fish = 254,000 bequerel/kilo
- Even assuming that a 1 year old Japanese baby eats 1 kilogram! of THIS fish!!....
- …such a fish-greedy baby would have ingested 254,000 bequerels of ^{137}Cs and, as a result, would have committed a dose of

$250{,}000 Bq \times 2.1\ 10^{-8}\ Sv\ Bq^{-1} = \underline{0.5\ mSv}$ over 70 years

…namely, the same dose that the baby would incur,in one go, if the parents travel with him by plane to Argentina to visit a relative!

3.
Lessons from Fukushima

INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

ICRP ref 4832-6303-9753
June 18, 2011

Terms of Reference for Task Group 84 of the ICRP Main Commission

Initial Lessons Learned from the NPP Accident in Japan vis-à-vis the ICRP System of Radiological Protection

Approved by the Main Commission on June 18, 2011

ICRP Task Group 84: Membership

- Makoto Akashi , National Institute of Radiological Sciences (NIRS), Japan;
- John D. Boice Jr. , International Epidemiology Institute, USA;
- Masamichi Chino, Japan Atomic Energy Agency (JAEA), Japan;
- Toshimitsu Homma, Japan Atomic Energy Agency (JAEA), Japan;
- Nobuhito Ishigure, Nagoya University, Japan;
- Michiaki Kai Oita, University of Nursing and Health Sciences, Japan;
- Shizuyo Kusumi, Nuclear Safety Commission, Japan;
- Jai-Ki Lee, Hanyang University, Korea;
- Hans-Georg Menzel, CERN, Switzerland;
- Ohtsura Niwa, Kyoto University, Japan;
- Kazuo Sakai, National Institute of Radiological Sciences, Japan
- Wolfgang Weiss, Federal Office for Radiation Protection (BfS), Germany;
- Shunichi Yamashita, Nagasaki University and Fukushima Medical University, Japan;
- Yoshiharu Yonekura , National Institute of Radiological Sciences , Japan, and,
- Abel J. González, Autoridad Regulatoria Nuclear, Argentina (Chair)

Issues identified

1. inferring radiation risks;
2. attributing radiation effects;
3. quantifying radiation exposure;
4. assessing internal exposures;
5. managing emergency crises;
6. protecting rescuers and volunteers;
7. responding with medical aid;
8. justifying disruptive protective actions;
9. transiting from the emergency to an existing situation;

Issues identified

10. rehabilitating evacuated areas;
11. categorizing public exposures due to an accident;
12. restricting public individual doses;
13. caring for infants and children;
14. considering pregnant women;
15. monitoring public protection;
16. dealing with ‘contamination’ of territories, rubble and residues, and consumer products;
17. recognizing psychological consequences; and,
18. fostering the sharing of information

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Death toll from Japan nuclear catastrophe could top 500,000

DATE: 13 AUGUST 2011 POSTED BY : SPECIAL TO THE CANADIAN

John H. Large has been reported as having predicted that the death toll in the years ahead could top the 500,000 attributed to the Chernobyl accident of 1986 and warned that panicked repair attempts could lead to an even greater disaster. Mr. Large, a British nuclear engineer, said: "The Japanese don't know how to deal with it. They're ad-libbing.

"Just throwing water on to the reactors, when they cannot get inside to see what the situation is, could mean the fuel goes critical again.

"And while the radiation leak so far is only a tenth of that at Chernobyl, that was in a rural area with a low population. In Japan it's an urban, densely packed area so the potential numbers of deaths and cancers are much higher."

Mr. Large is an independent nuclear engineer and analyst primarily known for his work in assessing and reporting upon nuclear safety and nuclear related accidents.[LINK] From the mid-1960s until 1986 Large was an academic in Brunel University's School of Engineering, where he undertook research for the United Kingdom Atomic Energy Authority.

Mr. Large prepared a critical review of the preliminary report of the IAEA Fact Finding Mission undertaken to Fukushima Dai-ichi in May 2011. [LINK][LINK]

Polls

Do you welcome and have reservations about Target taking over Zellers in Canada?

Welcome it

Have reservation

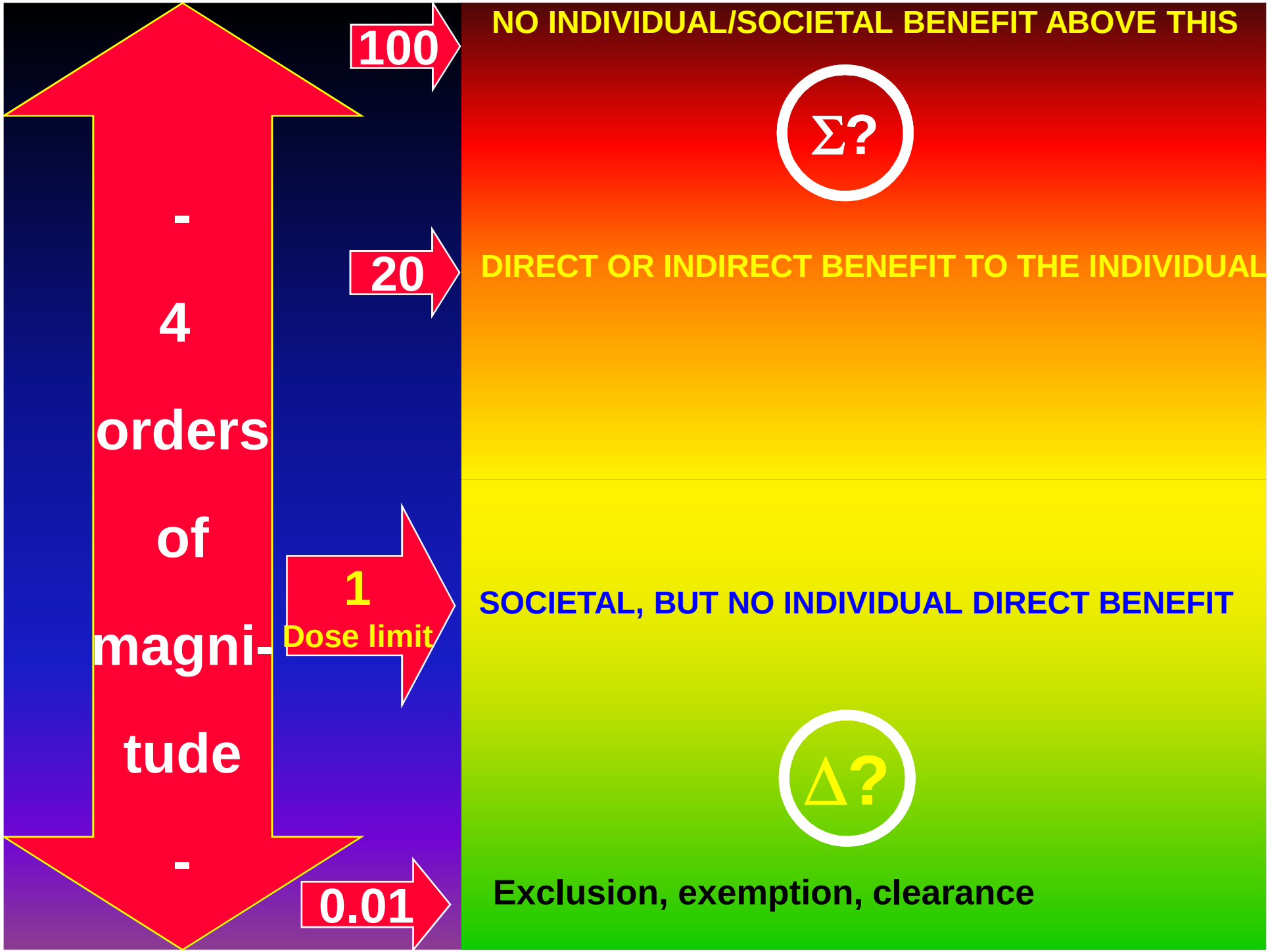
Vote Result

Blog | Books | Latest | Culture

- Manipulative Extraterrestrials control Earth suggests Dr. Michael Salla
- Humanized face of aliens control Earth suggests Dr. Michael Salla
- Perpetuated War and Canada's First Nations
- Toronto Housing Project linked to


Would I be one of the 500,000?


Justification of severe countermeasures, such as evacuation


100
20
1
Dose limit
0.01
- 4 orders of magni-tude -
NO INDIVIDUAL/SOCIETAL BENEFIT ABOVE THIS
Σ?
DIRECT OR INDIRECT BENEFIT TO THE INDIVIDUAL
SOCIETAL, BUT NO INDIVIDUAL DIRECT BENEFIT
Δ?
Exclusion, exemption, clearance

Probably the big lesson of Fukushima

- **The confusing situation created by the ‘contamination’ of the habitat is responsible of the only serious health effect attributable to Fukushima:**

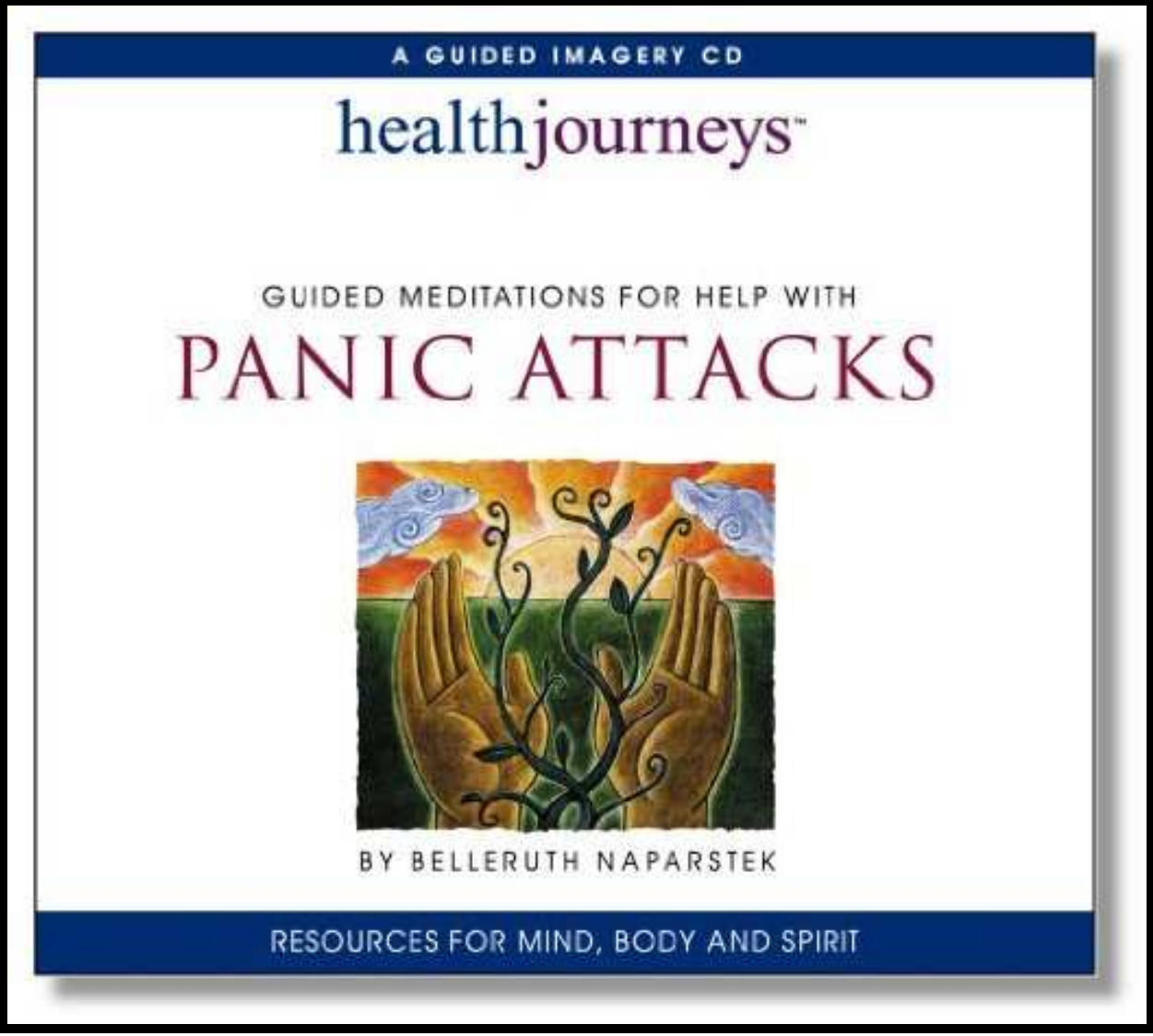
physiological consequences!

The psychological aftermath of Fukushima

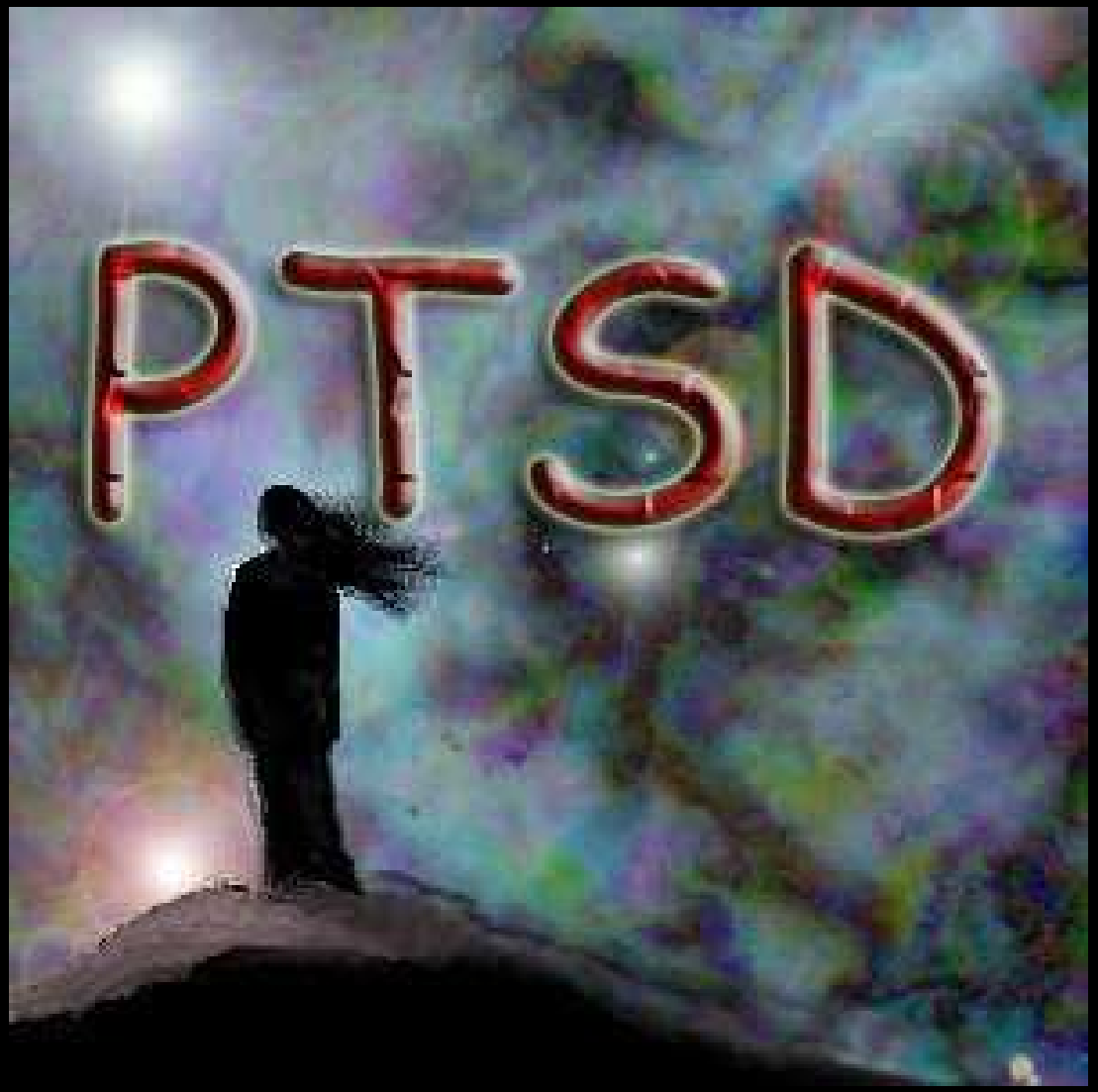
Depression

Grieving

Chronic anxiety



Post-traumatic Stress Disorder



Insomnia

Severe headaches

Smoking and alcoholism

Anger

Desperation

Parents' Anguish

Stigma

Stigma

Stigma

A mark of disgrace associated with being associated with '*contamination*'

- 汚名　：Polluted name
- 烙印　：Mark
- 恥　　：Shame
- 不名誉：Dishonour
- 不面目：Humiliation
- 被差別：Discrimination

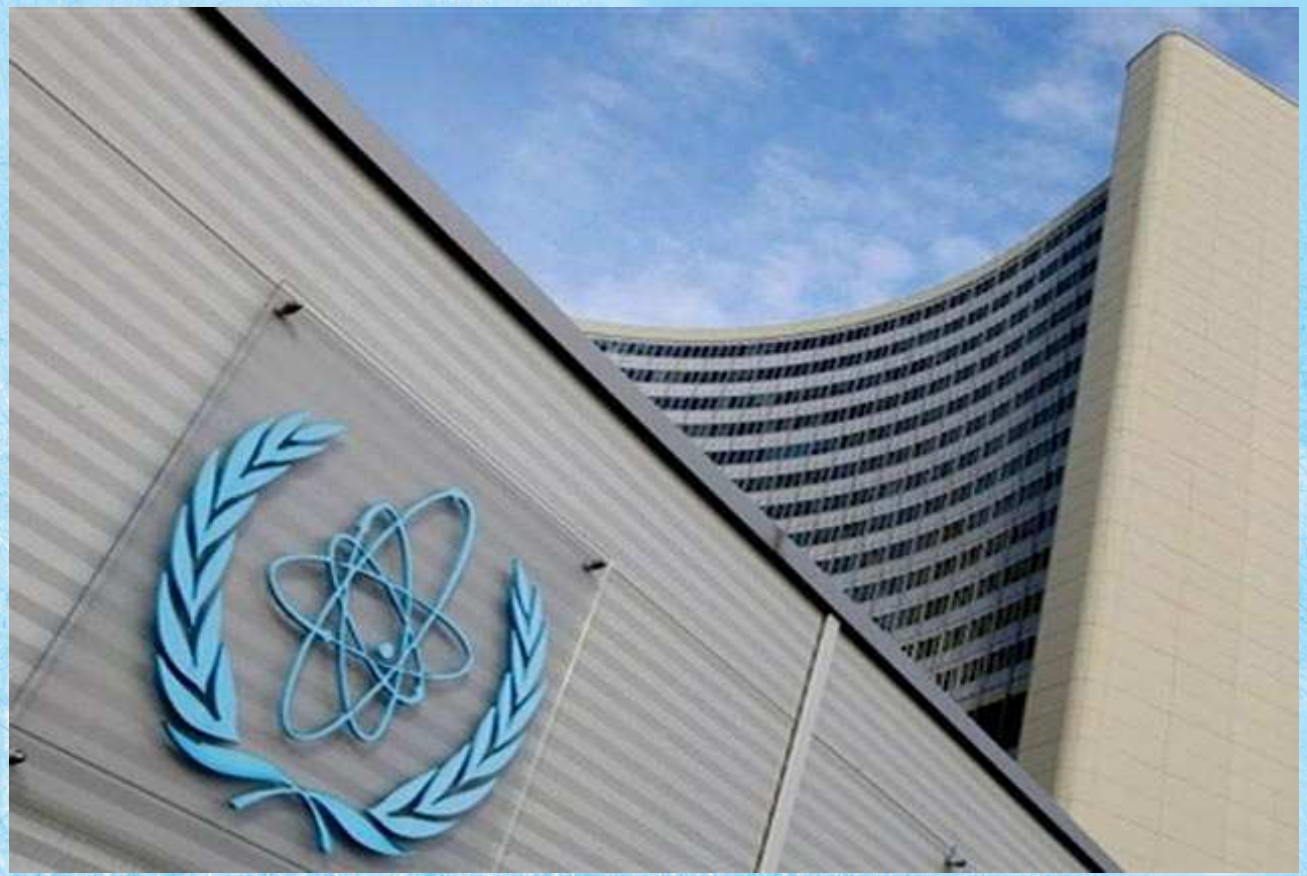
Outcome from Fukushima ‘contamination’

- Psychological effects caused by the experience of living in a ‘contaminated’ habitat are dominant.
- They are health effects in their own right.
- However, they are basically ignored.

4.
Epilogue

International Experts' Meeting on

Decommissioning and Remediation after a Nuclear Accident



The position of Argentina

The IAEA shall definitively:

- **establish *quantitative* safety standards for remediation.**
- **provide, at the request of States, for the application of these standards by means of *objective* and *quantitative* appraisals.**

The position of Argentina

The international safety regime (and the IAEA)

will fail in its objectives unless it is able to

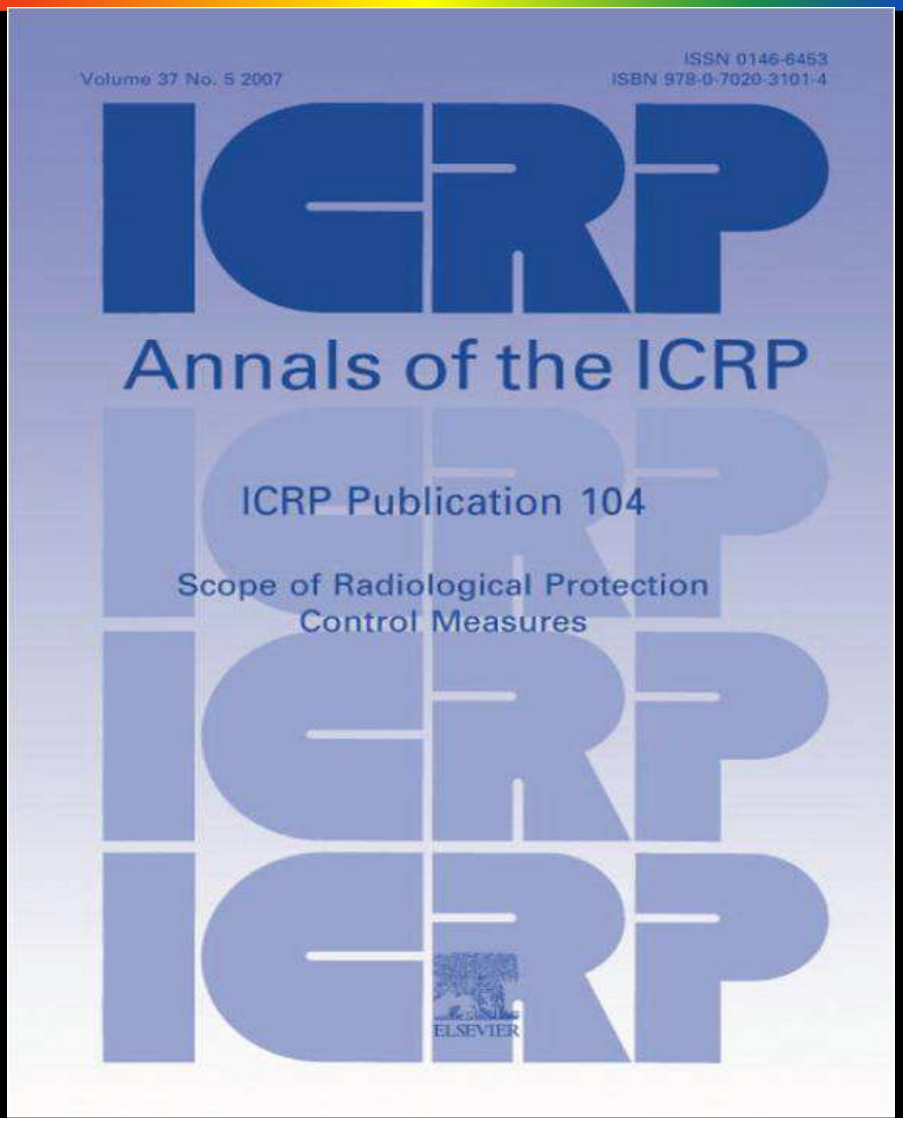
establish safe levels of ‘contamination’

(in land, rubble, consumer products, etc)

below which the situations may be considered

***harmless*, without any caveat.**

ICRP 104 may be helpful



Argentine position *vis-à-vis* the Action Plan

- The "Action Plan" should focus on the specific technical issues brought to light by Fukushima, **e.g. establishing universal remediation standards**, rather than on generic nuclear safety issues.

Argentine statement at both Ministerial Conferences

Argentina considers that the IAEA standards and its application should be

- quantitative,
- objective,
- measurable and comparable,

and that all qualifying subjectivism, either in the formulation of the standards or in their application, should be avoided.

Argentina's advise to both Ministerial Conferences

The Fukushima accident should

- **be analyzed with total transparency, technical accuracy, political serenity and deep retrospection.**
- **remain a challenge for nuclear power plant similarly located and/or designed, but should not be converted in a global nuclear safety problem.**
- **not be used as an argument for declaring nuclear power as inherently unsafe and much less to encourage early abandonment of nuclear renaissance.**

Let's start solving the concrete problems of remediation

A possible initial trigger

GC

GC(44)/RES/15

International Atomic Energy Agency

GENERAL CONFERE

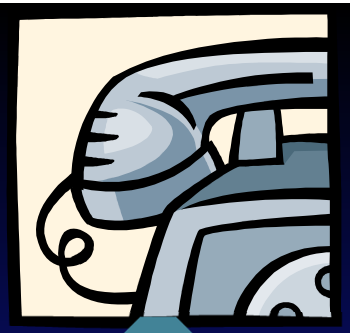
Forty-fourth regular session
Sub-item 14(b) of
(GC(44)/21)

ACTION PLAN

RADIOLOG A FOR LONG-LIVED RADIONUCLIDES IN COMM TIES (ESPECIALLY FOODSTUFFS AND WOOD)

Resolution adopted on 22 September 2000 at the tenth plenary meeting

Av. del Libertador 8250
Buenos Aires, Argentina



+541163231758

Thank you !

agonzalez@arn.gob.ar