Breakfast/Debate on Nuclear Law

Desayuno/Debate sobe Derecho Nuclear

INLA España

13.10.2025 - MADRID

INLA
INTERNATIONAL NUCLEAR LAW ASSOCIATION

MODERATORS:

- **Evelyne Ameye**
  President INLA España
- **Octavio Canseco**
  Secretary INLA España
- **Prof. Mariano Bacigalupo**
- **Jim Stewart**

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AGENDA:

- 1. 10:00 **Jim Stewart:** Nuclear waste and the principles of exclusion and exemption (and clearance)
- 2. 10:20 **Octavio Canseco:** The consent-based approach for the designation of the Decentralised Temporary Storage
- 3. 10:40 **Colin Austin/Mark Flynn:** Energy Solutions approach to waste reduction
- 4. 11:00 **Jorge Molinero:** Deep Geological Repositories for final disposal of spent fuel: a worldwide consensus
- 5. 11:20 **Zemfira Knott:** The changing nuclear landscape.
- 6. 11:40 **Ian Truman:** Proportionate regulatory control with respect to decommissioning in the UK
- **12:00 – 12:30 COFFEE BREAK**
- 7. 12:30 **Patrycja Nowakowska:** CSC - An opportunity or unnecessary burden? A case study based on Poland
- 8. 12:50 **Jakub Handrlica:** Microreactors for the moon
- 9. 13:10 **Łukasz Młynarkiewicz:** Streamlining Nuclear New Build: A Reliance-Based Regulatory Framework for Advanced Nuclear Technologies in the EU
- 10.13:30 **Máté Kukovecz (European Commission):** Evaluation of the Directive of Radioactive Waste and Spent Fuel (2011/70/Euratom) and of the Directive on Shipments of Radioactive Waste and Spent Fuel (2006/117/Euratom).
-

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Exclusion, exemption and Clearance

Jim Stewart

Waste profile

COM(2019) 632 final

Inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects

Spain			
	Total RAW Volume, m3		
Category	**2016**	**2030**	**2050**
VLLW	21107	45000	110800
LLW	39034	56000	90400
ILW	201	400	800
HLW	12	12	12

The categories of radioactive waste used for data aggregation are as follows:

- **Very Low Level Waste** (VLLW): waste that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near-surface, landfill-type facilities with limited regulatory control.
- **Low Level Waste** (LLW)**:** waste that is above clearance levels, but with limited amounts of long-lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities.
- **Intermediate Level Waste** (ILW): waste that, because of its content, particularly of long-lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its storage and disposal.
- **High Level Waste** (HLW): waste with levels of activity concentration high enough to generate significant quantities of heat by the radioactive decay process or waste with large amounts of long-lived radionuclides that need to be considered in the design of a disposal facility for such waste.

Exempt waste with concentrations of radionuclides small enough not to require provisions for radiation protection. Such material can be cleared from regulatory control and does not require any further consideration from a regulatory control perspective.
… not require future long-term management or disposal as radioactive waste due to …the exemption or clearance from regulatory control.

Definitions - waste

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

"radioactive waste" means radioactive material in gaseous, liquid or solid form for which no further use is foreseen by the Contracting Party or by a natural or legal person whose decision is accepted by the Contracting Party, and which is controlled as radioactive waste by a regulatory body under the legislative and regulatory framework of the Contracting Party

COUNCIL DIRECTIVE 2006/117/EURATOM

'radioactive waste' means radioactive material in gaseous, liquid or solid form for which no further use is foreseen by the countries of origin and destination, or by a natural or legal person whose decision is accepted by these countries, and which is controlled as radioactive waste by a regulatory body under the legislative and regulatory framework of the countries of origin and destination;

Definitions – radioactive material

IAEA Safety Glossary

radioactive material

Material designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.

radioactive waste

For legal and regulatory purposes, material for which no further use is foreseen that contains, or is contaminated with, radionuclides at activity concentrations greater than clearance levels as established by the regulatory body.

Definitions – exclusion, exemption and clearance

IAEA glossary

exemption level.

A value, established by a regulatory body and expressed in terms of activity concentration, total activity, dose rate or radiation energy, at or below which a source of radiation need not be subject to some or all aspects of regulatory control.

clearance level.

A value, established by a regulatory body and expressed in terms of activity concentration, at or below which regulatory control may be removed from a source of radiation within a notified or authorized practice.

exclusion

The deliberate excluding of a particular type of exposure from the scope of an instrument of regulatory control on the grounds that it is not considered amenable to control through the regulatory instrument in question.

IAEA GSR Part 3
International Basic Safety Standards

exemption

The determination by a regulatory body that a source or practice need not be subject to some or all aspects of regulatory control on the basis that the exposure and the potential exposure due to the source or practice are too small to warrant the application of those aspects or that this is the optimum option for protection irrespective of the actual level of the doses or risks.

A practice or a source within a practice may be exempted without further consideration from some or all of the requirements … provided that under all reasonably foreseeable circumstances :

- the effective dose expected to be incurred by any individual … is of the order of 10 μSv or less in a year.
- To take into account low probability scenarios, a different criterion could be used, namely that the effective dose expected to be incurred by any individual for such low probability scenarios does not exceed 1 mSv in a year.

The following sources within justified practices are automatically exempted without further consideration

(a) Material in a moderate amount … does not exceed the applicable exemption level given in Table I.1

(b) Material in bulk amount …does not exceed the relevant value given in Table I.2

The exemption values involving a moderate amount of material apply to practices involving small scale usage of activity where the quantities involved are at the most of the order of a tonne. The regulatory body will need to establish the amounts for which the concentration values may be applied.

The exemption levels in Table I.1 and the exemption and clearance levels in Table I.2 were derived using a conservative model based on

- the criteria …
- and a series of limiting (bounding) scenarios for use and disposal …

Exemptions may be granted subject to conditions specified by the regulatory body, such as

- Conditions relating to the physical or chemical form of the radioactive material, and
- To its use or the means of its disposal.

The general criteria for clearance are that:

(a) Radiation risks arising from the cleared material are sufficiently low as not to warrant regulatory control, and there is no appreciable likelihood of occurrence for scenarios that could lead to a failure to meet the general criterion for clearance; or

(b) Continued regulatory control of the material would yield no net benefit, in that no reasonable control measures would achieve a worthwhile return in terms of reduction of individual doses or reduction of health risks.

Radioactive material within a notified practice or an authorized practice may be cleared without further consideration provided that:

- The activity concentration of an individual radionuclide of artificial origin in solid form does not exceed the relevant level given in Table I.2;

Clearance may be granted by the regulatory body for specific situations…with account taken of the physical or chemical form of the radioactive material, and its use or the means of its disposal.

The exemption levels set out in Table I.1 and the exemption and clearance levels set out in Table I.2 were derived using a conservative model

Exclusion – IAEA BSS

Exposures deemed to be not amenable to control are excluded from the scope of these Standards.

It is generally accepted, for example, that it is not feasible to control 40K in the body or cosmic radiation at the surface of the Earth

EURATOM BSS

Article 3

Exclusion from the scope

This Directive shall not apply to:

(a) exposure to the natural level of radiation, such as radionuclides contained in the human body and cosmic radiation prevailing at ground level;

(b) exposure of members of the public or workers other than air or spacecrew to cosmic radiation in flight or in space;

(c) aboveground exposure to radionuclides present in the undisturbed earth's crust.

1. Exemption

Practices may be exempted from notification either

- directly, on the basis of compliance with exemption levels … laid down in section 2, or
- on the basis of higher values that, for specific applications, are established by the competent authority, satisfying the general exemption and clearance criteria set out in section 3.

2. Exemption and clearance levels

…

(b) The exempt activity concentration values … are laid down in Table A, Part 1,…

(c) The concentration values in Table A, Part 1, … also apply to the clearance of solid materials for reuse, recycling, conventional disposal or incineration.

Higher values may be defined for specific materials or specific pathways, taking Community guidance into account, including, where appropriate, additional requirements, in terms of surface activity or monitoring requirements.

3. General exemption and clearance criteria

(a) The general criteria for the exemption of practices from notification or authorisation or for the clearance of materials from authorised practices are as follows:

- (i) the radiological risks to individuals caused by the practice are sufficiently low, as to be of no regulatory concern; and
- (ii) the type of practice has been determined to be justified; and
- (iii) the practice is inherently safe.

(b) Practices involving small amounts of radioactive substances or low activity concentrations, comparable to the exemption values laid down in Table A or Table B are deemed to fulfil criterion (iii).

(c) Practices involving amounts of radioactive substances or activity concentrations below the exemption values laid down in Table A, Part 1, or Table B, are deemed to comply with criterion (i) without further consideration. ….

(d) In the case of moderate amounts of material, as specified by Member States for specific types of practice, the activity concentration values laid down in Table B, column 2, may be used instead of the values laid down in Table A, Part 1, for the purpose of exemption from authorisation.

(e) For the purpose of …clearance, where amounts of radioactive substances or activity concentrations do not comply with the values laid down in Table A or Table B, an assessment shall be made …

There is a benefit in having the same activity concentration values both for

- **the exemption of practices from regulatory control and**
- **for the clearance of materials from authorised practices.**

After a comprehensive review, it has been concluded that the values recommended in IAEA publication Application of the Concepts of Exclusion, Exemption and Clearance can be used both as default exemption values…

Member States should be able to grant specific exemption from authorisation for certain practices involving activities above the exemption values.

Specific clearance levels, as well as corresponding Community guidance, remain important tools for the management of large volumes of materials arising from the dismantling of authorised facilities.

Exemption and clearance data

IAEA BSS – EURATOM BSS

Both incorporate numbers from RS-G-1.7 by direct reference

Conclusion

	IAEA			EURATOM	
Nuclide	Moderate amount	Large amount		Moderate amount	Large amount
Co-60	10	0.1		10	0.1
Sr-90	100	1		100	1
Cs-137	10	0.1		10	0.1

IAEA GSG-7 Occupational Radiation Protection

The government or the regulatory body is required to determine which practices or sources within practices are to be exempted from some or all of the requirements

Exemption or clearance is the appropriate regulatory option if the radiation risks are too low to warrant regulatory control or if the imposition (or retention) of regulatory control would yield no net benefit

The general criterion for exemption or clearance without further consideration is an effective dose of the order of

- 10 μSv or less in a year (or 1 mSv or less in a year in the case of low probability scenarios).
- 1 mSv or less in a year for exemption of bulk material containing radionuclides of natural origin
- 1 Bq/g or 10 Bq/g for clearance of certain natural radionuclides
  - The 10 μSv criterion is one or two orders of magnitude below the normal variations in exposure to natural background radiation.

IAEA GSG-17
Application of the Concept of Exemption

Reason for development

It is recognized that the values for exemption and clearance currently defined for artificial radionuclides are unnecessarily restrictive in that the exposure scenarios used in their derivation are highly conservative. It is not intended that the revision of RS-G-1.7 will include the derivation of new values for exemption, but rather provide guidance on how to avoid additional layers of conservativism in other steps of the process.

IAEA GSG-18
Application of the Concept of Clearance

Reason for development

The information in Safety Guide RS-G-1.7 regarding the application of the clearance concept is still relevant, however it has been noted by the Member States that the guidance should be expanded to provide more details on the clearance process; establishment of national regulations; planning, organization and implementation; technical and safety implications; and resources needed to implement the clearance process.

The calculation scenarios and models described in the Safety Report 44 are still valid and therefore there is no need to repeat this information in the revised guidance.

IAEA GSG-17
Application of the Concept of Exemption

Excluded exposures are exposures for which control measures are not required, regardless of the magnitude of such exposures. Therefore, sources leading to such exposures are excluded from regulatory control and are outside the scope of the requirements …

IAEA GSG-17
Application of the Concept of Exemption

exemption can be applied either without further consideration (generic exemption…) or through the imposition of specific conditions by the regulatory body (specific exemption…).

The regulatory body should establish a framework for exemption …

the regulatory body should provide the criteria for generic exemption and additional information relevant to specific exemptions.

IAEA GSG-17
Application of the Concept of Exemption

A practice or a source within a practice may be exempted without further consideration … provided that … the effective dose expected … is of the order of 10 μSv or less in a year.

The phrase “of the order of 10 μSv or less in a year” is intended to be considered a trivial dose. *This is intended to cover the range 10–100 μSv in a year*

Very simplified technical data

RP 65 – European Commission – 1993

SRS 44 – IAEA – 2005

Built in pessimisms?

			Comes from	Limiting model	Exact limit	Rounding pesimism
Co-60	Moderate amount	10	RP-65	EXT(W)	6.64	151%
	Large amount	0.1	SRS 44	RH	0.0309	324%
Sr-90	Moderate amount	100	RP-65	EXT(W)	158	63%
	Large amount	1	SRS 44	RL-C	0.5470	183%
Cs-137	Moderate amount	10	RP-65	EXT(W)	29.5	34%
	Large amount	0.1	SRS 44	RH	0.1190	84%

Political issues

A common level is very beneficial

We have agreement on existing values – dare we open pandora's box?

Who sets levels, government, regulator, international body?

Questions

How do we ensure due diligence in asserting application of technical data that is incorporated into legislation?

Technical reviews (EC, IAEA, NEA)

Regulatory text (EC, IAEA)

How can INLA assist in developing and supporting an effective process.

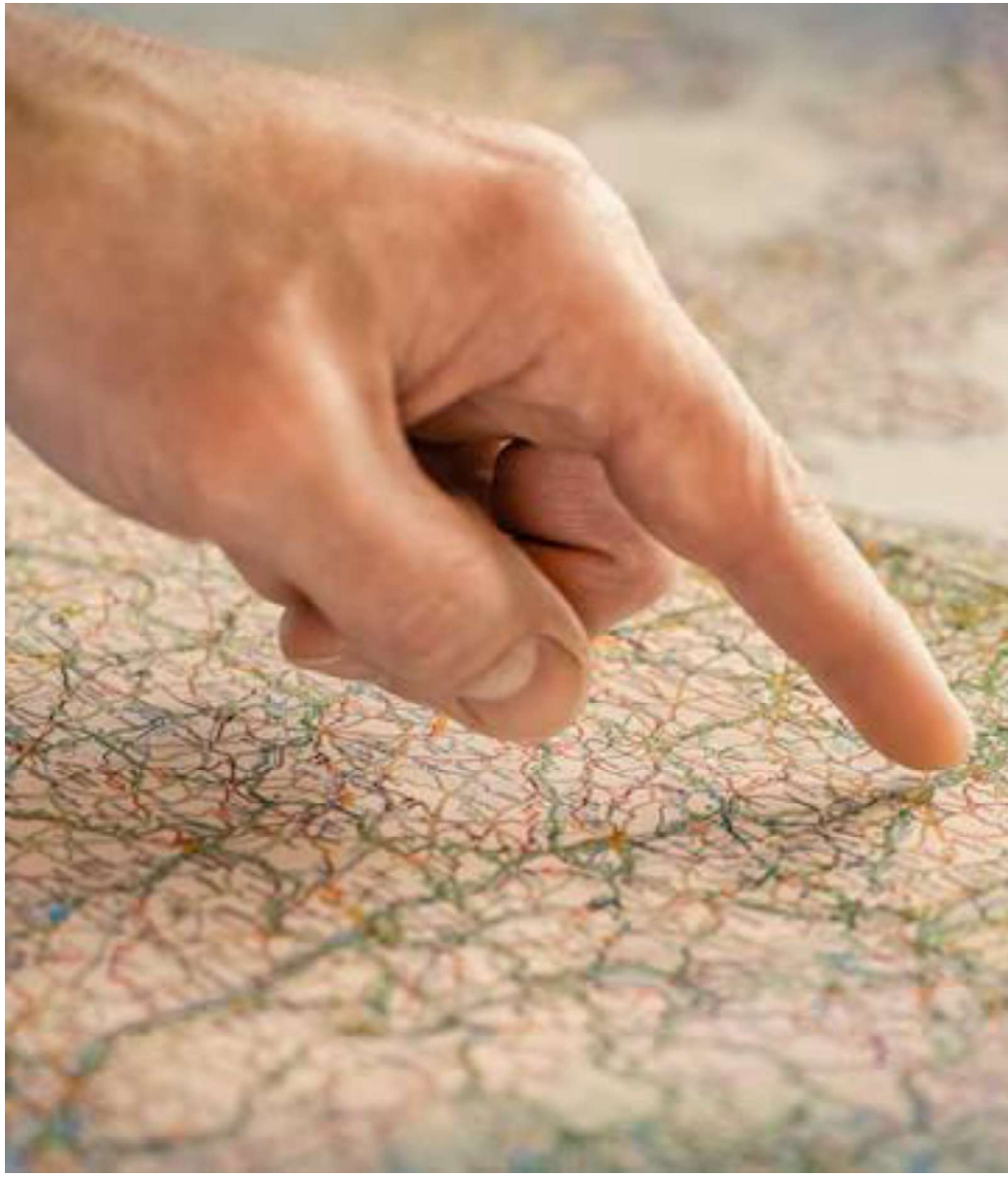
Are there any liabilities for failure to act?

Clifford Chance

La designación del ATD con celda caliente en el VII PGRR: posibles problemas

The designation of the Decentralised Temporary Storage with a hot cell under the 7th Radioactive Waste Plan: possible problems

Octavio Canseco | INLA-Spain, 13 Octubre 2025



Clifford Chance

VII PGRR: descarta ATC por no alcanzarse el "necesario grado de consenso social, politico e institucional"

7th Radioactive Waste Plan: *drops a Centralised Temporary Storage due to not reaching the "required degree of social, political and institutional consensus"*

Clifford Chance

Opción elegida de mantener 7 ATDs: *¿statu quo*?
NO: sólo una celda caliente (operativa en 2031)

Chosen option of 7 Decentralised Temporary Storages: ¿a status quo?
NO: *only one is to be equipped with a hot cell (to be operative in 2031), which shall serve also the 6 remaining Decentralised Temporary Storages*

Clifford Chance

Debe seleccionarse una ubicación: opciones…

(a) Voluntariedad (concurso)

(b) Unilateralidad (imposición)

So a location must still be selected: the options are…

(a) Voluntariness (contest between interested locations)

(b) Unilaterality (imposition of the location by the Government)

Clifford Chance

Opción A: Voluntariedad

- Ventajas: consenso

- Problema: tiempos (bases, adjudicación, ¿impugnaciones?... ATC: 5 años, 8 para ser firme)

Option A: Voluntariness

(a) Advantages: consent-based approach

(b) Problem: timings (assessment criteria, awarding process, possible challenges...)

Clifford Chance

Opción B: Unilateralidad

- Ventajas: rapidez; base jurídica (LEN, STC 14/04…)

- Problema: contradicción con descarte del ATC (¿actos propios? ¿arbitrariedad? ¿desigualdad de trato?), e igualmente impugnaciones (pro y contra)

Option B: Unilaterality

(a) Advantages: swiftness, and existence of legal grounds

(b) Problem: contradiction, and possible challenges anyway

Clifford Chance

Estado actual: 1er ATD (Garoña), ¿descartado?
- I.I.A. (BOE 07/V/25): recuperabilidad "no a nivel de combustible" = No celda caliente
- Falta de motivación = falta de transparencia

Current status: first Decentralised Storage, not selected?
- Environ. Impact Report (2025) does not contemplate a hot cell
- Lack of motivation = lack of transparency

Clifford Chance

¿Qué criterios se van a tener en cuenta?

- ¿Postulación pasada al ATC? (Ascó)
- ¿Rechazo de permanencia de ATD? (Almaraz)

What is the criteria that will be considered for designating the location of the sole hot cell?

- Application for hosting Centralised Storage in the past? (Ascó)

- Refusal to host a Decentralised Storage? (Almaraz)

Clifford Chance

Algunas cuestiones para el debate:

- ¿Opción A u Opción B?
- ¿Qué criterios primarán en Opción B?

Some issues for debate:

- Option A or Option B?

- Which criteria will prevail in Option B?

Clifford Chance

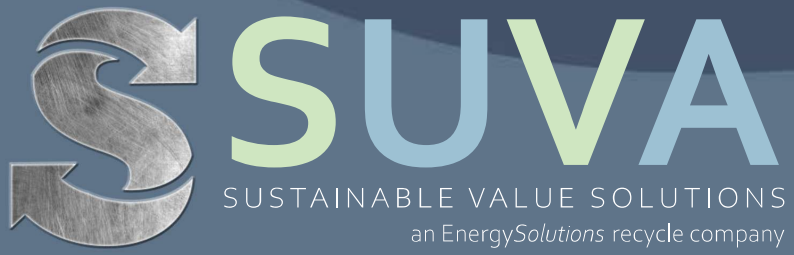
Gracias

Thank you

Clifford Chance, Paseo de la Castellana 110, 28046 Madrid, Spain

cliffordchance.com

EnergySolutions Approach to Waste Reduction



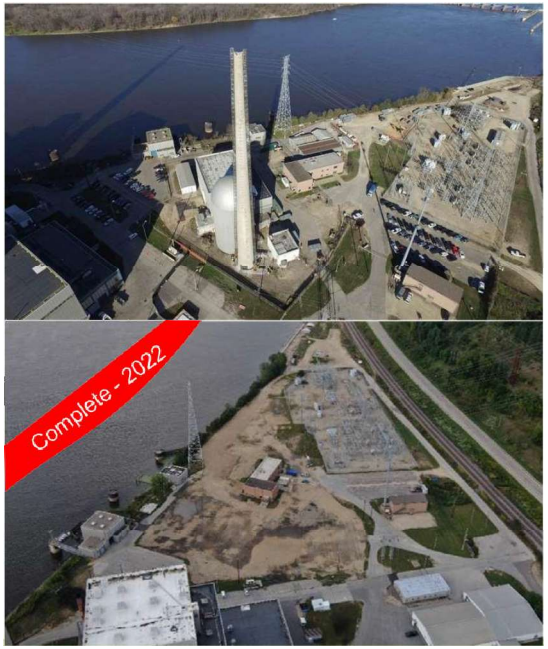
Colin R. Austin & Mark P. Flynnn

October 13th, 2025

US Decommissioning Experience

SEFOR

La Crosse

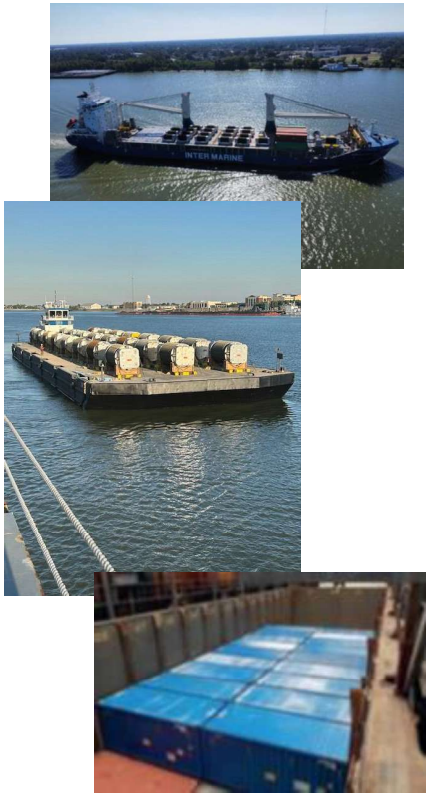


ZION

Transferability?

International Metal Recycle

Large Components



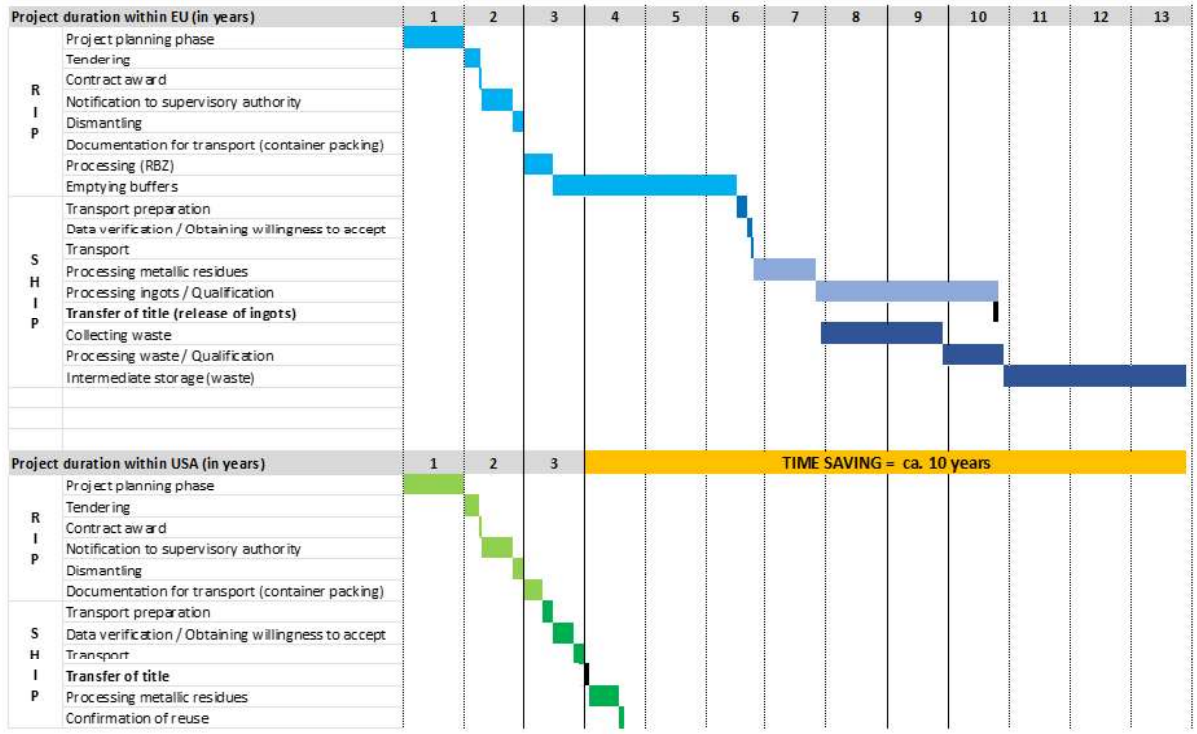
International Transport

Metal Components

Paradigm Shift in Performance

International D&D Resemble US D&D

Temporal comparison



ENERGYSOLUTIONS GNS Preussen Elektra

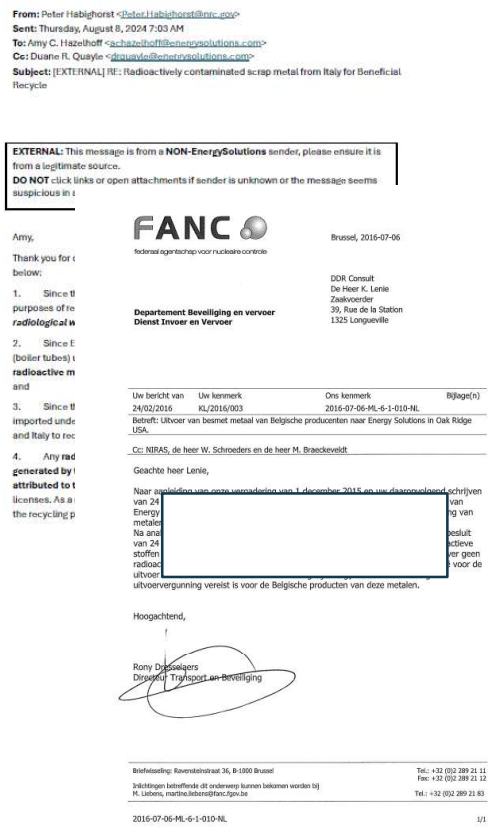
Regulation Makes it Possible!

Regulatory Authorizations

- US Federal Regulations 10CFR110
- IAEA Joint Convention on the Safety of Spent Fuel Management / Safety of Radioactive Waste Management
- Euratom Directives – 2006/117/Euratom & 2011/70/Euratom
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes – NOT APPLICABLE

Essentially - Based on Moral Obligation

Authorizations Validated



From: Peter Habighorst <Peter.Habighorst@nrc.gov>
Sent: Thursday, August 8, 2024 7:03 AM
To: Amy C. Hazelhoff <achazelhoff@energysolutions.com>
Cc: Duane R. Quayle <drquayle@energysolutions.com>
Subject: [EXTERNAL] RE: Radioactively contaminated scrap metal from Italy for Beneficial Recycle

EXTERNAL: This message is from a **NON-EnergySolutions** sender, please ensure it is from a legitimate source.
DO NOT click links or open attachments if sender is unknown or the message seems suspicious in a

Amy,

Thank you for
below:

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FANC
federaal agentschap voor nucleaire controle

Brussel, 2016-07-06

DDR Consult
De Heer K. Lenie
Zaakvoerder
39, Rue de la Station
1325 Longueville

Departement Beveiliging en vervoer
Dienst Invoer en Vervoer

Uw bericht van	Uw kenmerk	Ons kenmerk	Bijlage(n)
24/02/2016	KL/2016/003	2016-07-06-ML-6-1-010-NL	

Betreft: Uitvoer van besmet metaal van Belgische producenten naar Energy Solutions in Oak Ridge USA.

Cc: NIRAS, de heer W. Schroeders en de heer M. Braeckeveldt

Geachte heer Lenie,

Naar aanleiding van onze vergadering van 1 december 2015 en uw daaropvolgend schrijven van 24 van Energy van metalen Na ana esluit van 24 ctieve stoffen er geen radioac voor de uitvoer uitvoervergunning vereist is voor de Belgische producten van deze metalen.

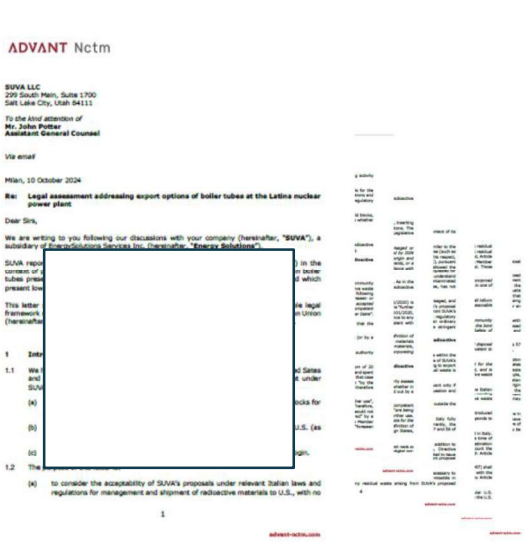
Hoogachtend,

Rony Dresselaers
Directeur Transport en Beveiliging

Briefwisseling: Ravensteinstraat 36, B-1000 Brussel
Tel.: +32 (0)2 289 21 11
Fax: +32 (0)2 289 21 12

Inlichtingen betreffende dit onderwerp kunnen bekomen worden bij
M. Liebens, martine.liebens@fanc.fgov.be
Tel.: +32 (0)2 289 21 83

2016-07-06-ML-6-1-010-NL 1/1



ADVANT Nctm

SUVA LLC
299 South Main, Suite 1700
Salt Lake City, Utah 84111

To the kind attention of
Mr. John Potter
Assistant General Counsel

Via email

Milan, 10 October 2024

Re: Legal assessment addressing export options of boiler tubes at the Latina nuclear power plant

Dear Sirs,

We are writing to you following our discussions with your company (hereinafter, "**SUVA**"), a subsidiary of

SUVA repo
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This letter
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1.1 We

(a)

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(a) to consider the acceptability of SUVA's proposals under relevant Italian laws and regulations for management and shipment of radioactive materials to U.S., with no

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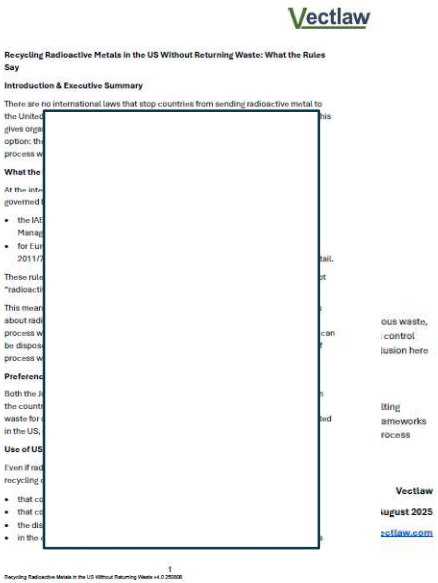
advant-nctm.com



Vectlaw

Recycling Radioactive Metals in the US Without Returning Waste: What the Rules Say

Introduction & Executive Summary

There are no international laws that stop countries from sending radioactive metal to the United gives orga option: th process w

What the

At the inte governed

- the IA Manag
- for Eur 2011/7

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Vectlaw
ugust 2025
ectlaw.com

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Recycling Radioactive Metals in the US Without Returning Waste v4.0.250806

New System in Law in JPN

*Exemptional clause to export Radioactive Waste

<Quote>
The item must be one listed in the middle column of Item 21 of Appendix Table 2 of the Export Trade Control Order (Cabinet Order No. 378 of 1949) and meet the following conditions:
It is recognized that, in Japan, appropriate and reasonable treatment is difficult, and it falls under one of the following:

a. Heat exchangers (feedwater heaters) (Meaning the items set forth in 4.(1) under the column "Reactor cooling system facilities" for "Boiling water type power reactor facilities (excluding those pertaining to steam turbines)" in Appendix Table 2 of the Regulation on Installation, Operation, etc. of Commercial Power Reactors (Ordinance of the Ministry of International Trade and Industry No. 77 of 1978; hereinafter "Commercial Reactor Regulation"), and items equivalent thereto.)

b. Steam generators (Meaning the items set forth in 4.(1) under the column "Reactor cooling system facilities" for "Pressurized water type power reactor facilities (excluding those pertaining to steam turbines)" in Appendix Table 2 of the Commercial Reactor Regulation, and items equivalent thereto.)

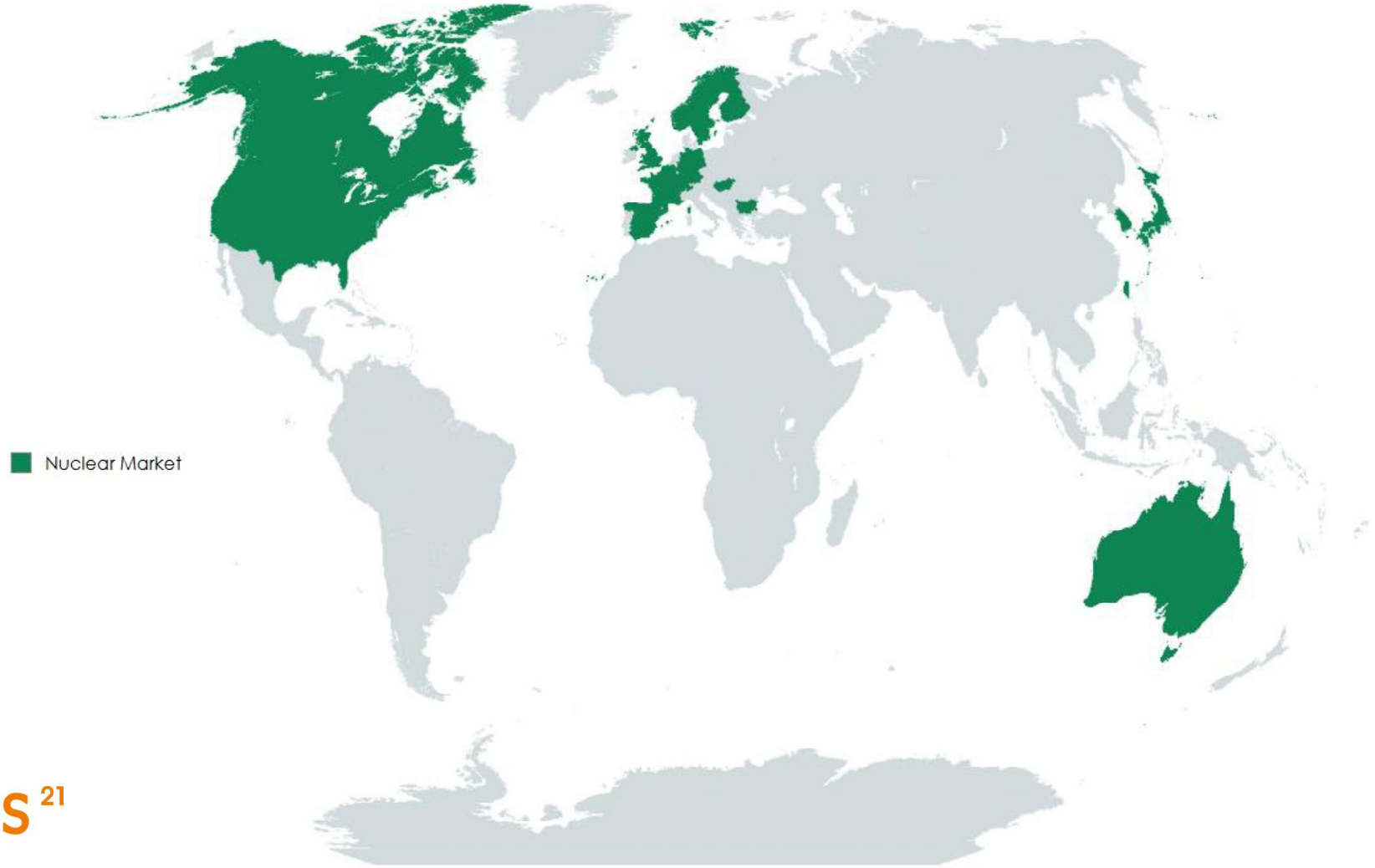
c. Transport and storage containers for spent fuel (Meaning the items set forth in 1.(3) and 3.(7) for "Boiling water type power reactor facilities" and in 1.(3) and 3.(5) for "Pressurized water type power reactor facilities" under the column "Facilities for handling and storage of nuclear fuel material" in Appendix Table 2 of the Commercial Reactor Regulation, and items equivalent thereto.)

2

AMPHOS 21
an RSK company

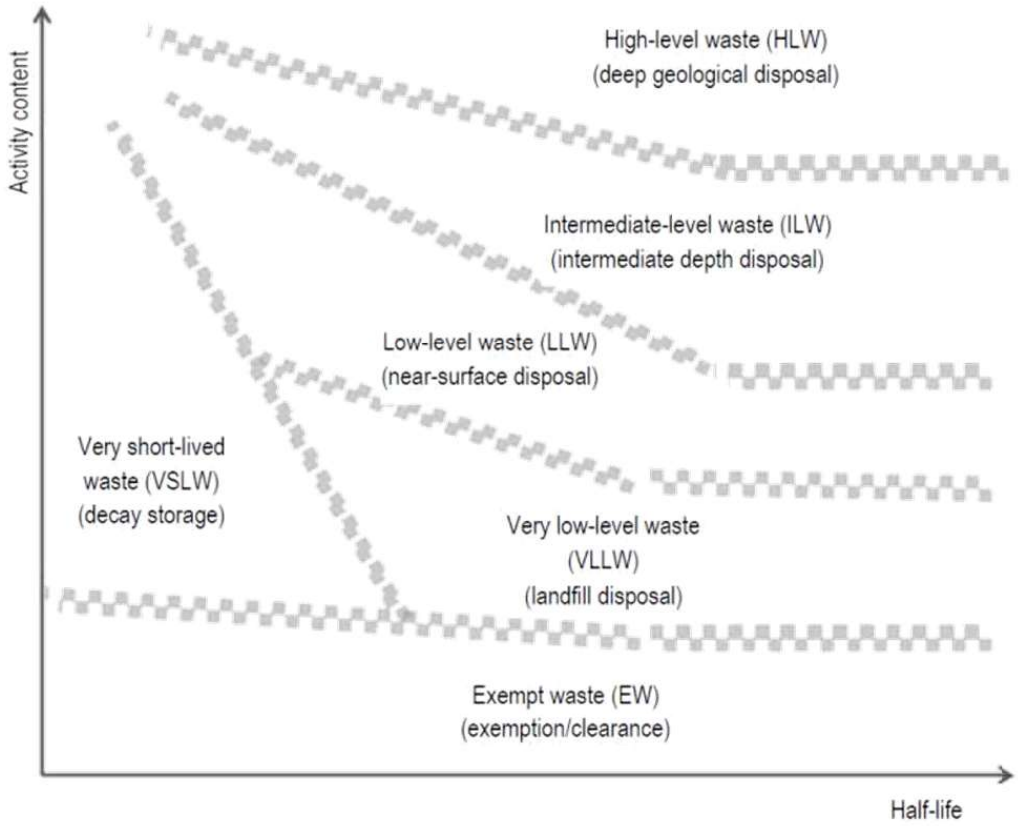
Radwaste Management

Where we work in Nuclear



AMPHOS 21
an RSK company

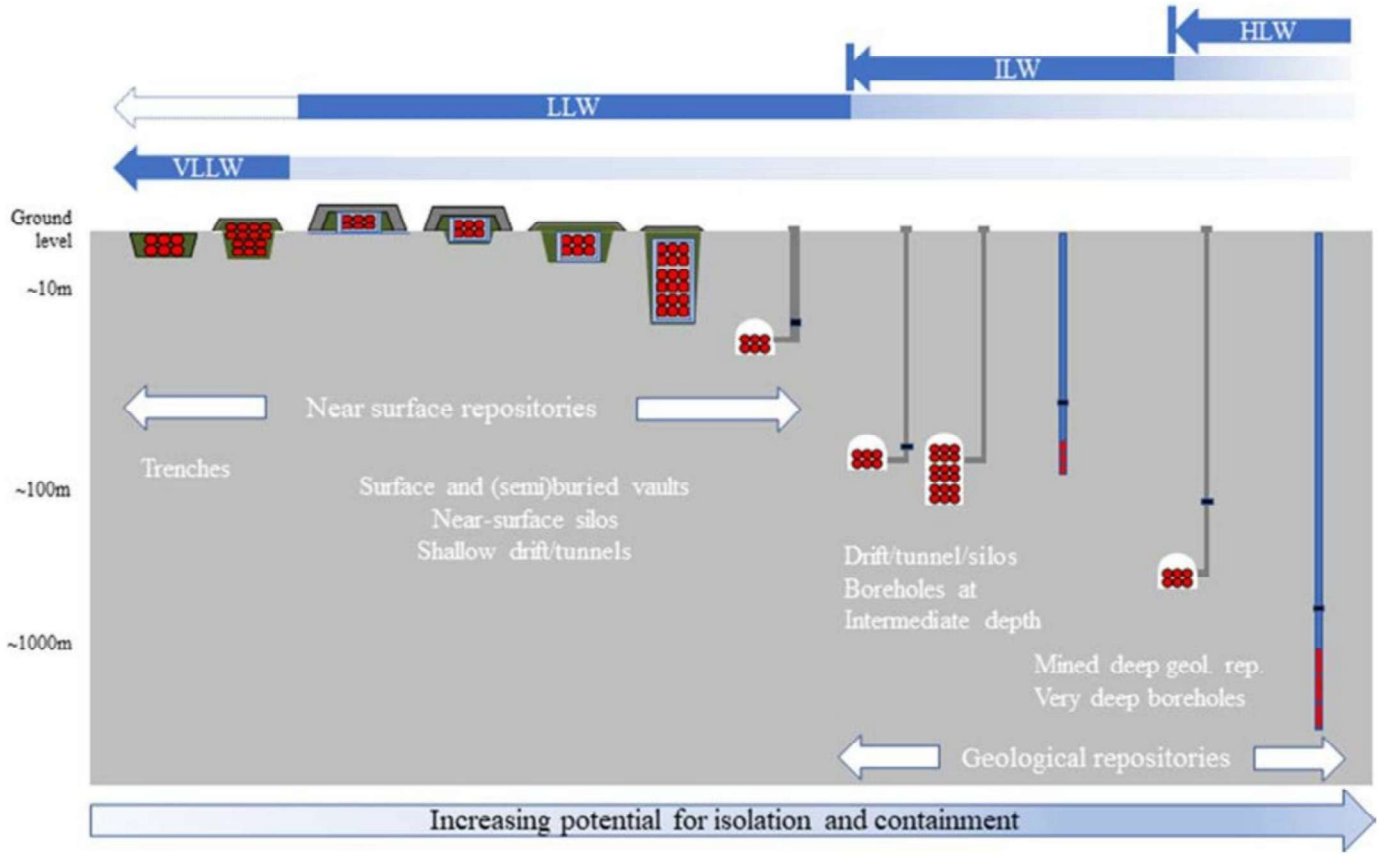
Radioactive waste



Source (IAEA)

AMPHOS 21
an RSK company

Radioactive waste



Source (IAEA)

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CIRES, Industrial facility for grouping, sorting and disposal. Andra, France.

Engineering barriers and radwaste evolution (degradation, interactions…)

Geochemical modelling

Environmental safety assessment

AMPHOS 21
an RSK company

ANDRA
Agence nationale pour la gestion des déchets radioactifs

El Cabril radioactive waste disposal. ENRESA

R&D for cover engineering of radioactive waste repository in Spain, material testing

Hydrogeological modelling, advanced numerical simulations

Long term evolution of waste (i.e. cellulose degradation)

Monitoring systems design, installation and control

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an RSK company

GOBIERNO DE ESPAÑA
VICEPRESIDENCIA TERCERA DEL GOBIERNO
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

enresa

Cigeo, Industrial Centre for Geological Disposal. Andra, France.

R&D for bentonite plugs and sealing components

Engineering barriers and radwaste evolution (degradation, interactions…)

Colloid transport and criticality issues in cells

THMC modelling, advanced numerical simulations…

AMPHOS 21
an RSK company

ANDRA
Agence nationale pour la gestion des déchets radioactifs

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www.amphos21.com

www.rskgroup.com

30 years and beyond 1994-2024

Northcourt
Nuclear Risk Specialists

An Optio company

The Changing Nuclear Landscape
13 October 2025

Zemfira Knott
Director

Who we are

Northcourt is an international insurance and reinsurance Managing General Agent sponsored by Lloyd's and the company market.

Northcourt can underwrite risks on a truly international basis wherever Lloyd's has a license to issue insurance or reinsurance policies.

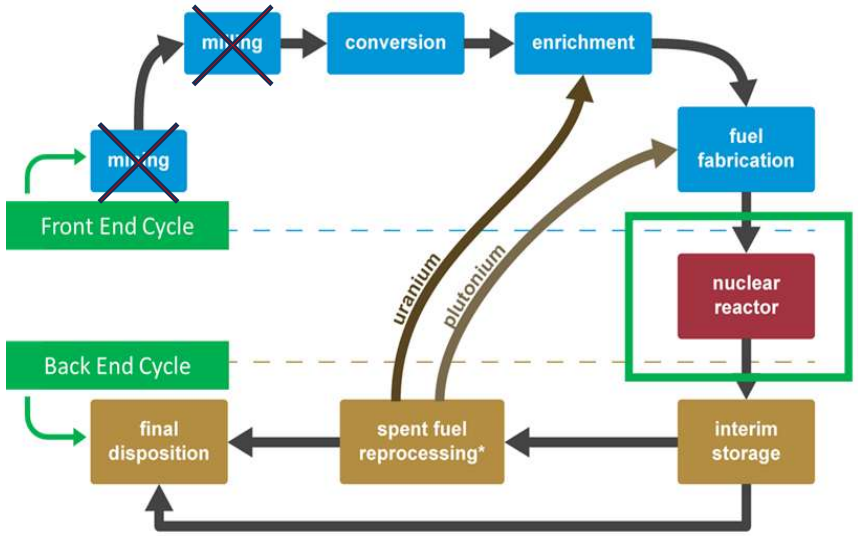
All of its panel of insurers are "A" security rated or above.

It has truly professional nuclear staff with over 100 years of collective experience.

Northcourt operates Nuclear Property Damage and Nuclear Third Party Liability Binders.

Northcourt is headquartered in Malta with a branch office in London.

What we do / our insureds



Nuclear utilities	Nuclear fuel fabricators
Governments	Enrichment facilities
Nuclear waste facilities	Nuclear research reactors
Investors in nuclear	Contractors
Suppliers	Regulators

The changing nuclear landscape

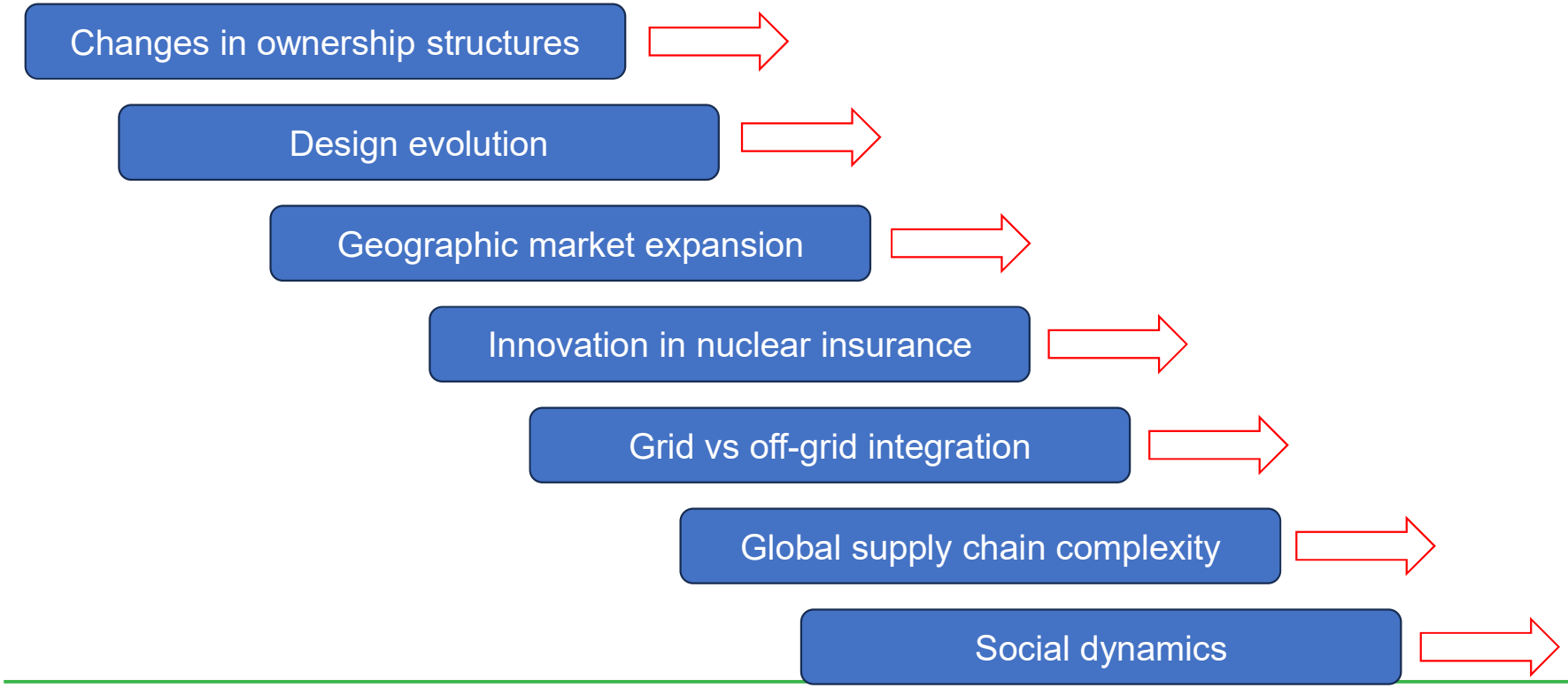
Energy transition - the energy trilemma challenge

A framework for policymakers to balance three main objectives:

- **Security of supply:** ensuring reliability of energy supplies
- **Affordability:** minimising the cost of energy to consumers
- **Sustainability:** decarbonising energy / net zero targets

Achieving progress in one area often comes at the expense of the other two, making it a very complex balancing act

Changing nuclear landscape – “before and after”



Challenges to overcome

- Financing and investor confidence
- Regulatory complexity
- Supply chain / Skills shortage
- Political commitment
- Cost overruns
- Fuel supply
- Waste storage

Summary

The nuclear industry is undergoing a major shift from its traditional model of large, centralised reactors towards a more flexible, innovative, and diversified future.

Historically defined by gigawatt-scale plants, complex construction timelines, and heavy state involvement, nuclear energy is now being reimagined through smaller, modular, and advanced designs that promise faster deployment, lower costs, and new applications beyond electricity generation.

This evolution is driven by a combination of factors:

- the urgency of decarbonisation
- heightened energy security concerns
- renewed geopolitical competition over energy independence
- technology leadership

In essence, nuclear energy is evolving from a legacy infrastructure model into a dynamic, technology-driven sector central to achieving net zero and ensuring long-term energy resilience.

INLA Spain

Proportionate Regulatory Control

Ian Truman
Partner

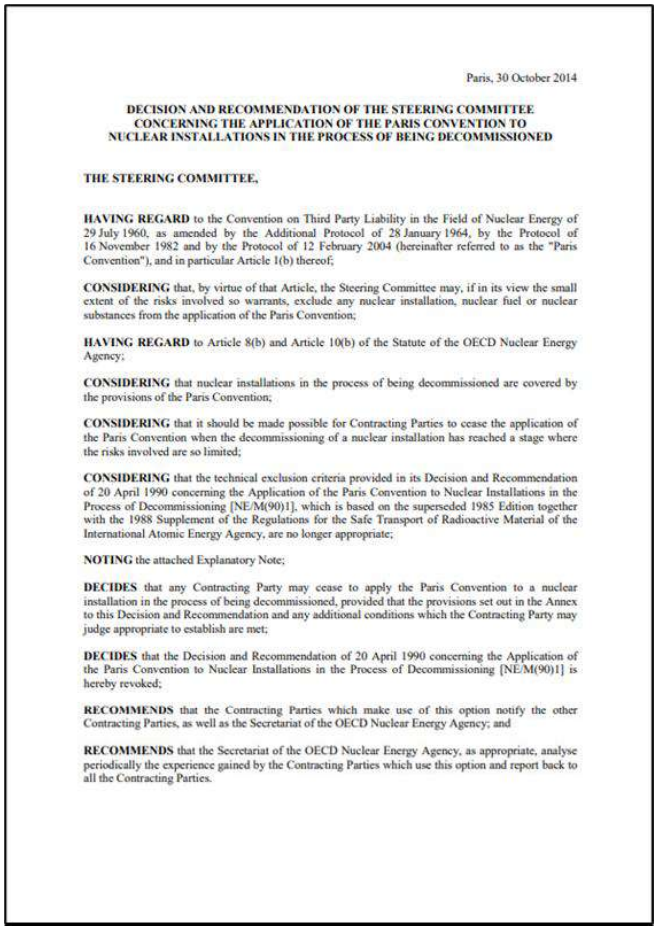
13 October 2025

Where are we now?

- Decommissioning sites remain subject to nuclear regulation (SSSL) until they are delicensed, relicensed or they become occupied by the Crown
- 'Delicensing' occurs when ONR gives notice in writing that in its opinion there has ceased to be any danger from ionising radiations from anything on the site (the '*no danger*' test)
- The operator does not need to prove the site is completely safe but must demonstrate that an additional risk of death to an individual of *less than one in a million per year*
- Considered broadly equivalent to exemption under the IBSS
- Onerous in practice
- Leaving nuclear sites that are fairly low risk subject to duplication of regulation by nuclear and environmental regulators

NEA Steering Committee Decision 2014

- Operations of the installation must have permanently ceased
- Any fuel, material in process, radioactive waste and radionuclide inventory must be removed or decayed to levels below the ‘exclusion criteria’ (activity and dose)
- The installation must remain under control and subject to the regulations of the competent national authority
- There must be containment and control of remaining radioactivity approved by the competent national authority



Paris, 30 October 2014

DECISION AND RECOMMENDATION OF THE STEERING COMMITTEE CONCERNING THE APPLICATION OF THE PARIS CONVENTION TO NUCLEAR INSTALLATIONS IN THE PROCESS OF BEING DECOMMISSIONED

THE STEERING COMMITTEE,

HAVING REGARD to the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004 (hereinafter referred to as the "Paris Convention"), and in particular Article 1(b) thereof;

CONSIDERING that, by virtue of that Article, the Steering Committee may, if in its view the small extent of the risks involved so warrants, exclude any nuclear installation, nuclear fuel or nuclear substances from the application of the Paris Convention;

HAVING REGARD to Article 8(b) and Article 10(b) of the Statute of the OECD Nuclear Energy Agency;

CONSIDERING that nuclear installations in the process of being decommissioned are covered by the provisions of the Paris Convention;

CONSIDERING that it should be made possible for Contracting Parties to cease the application of the Paris Convention when the decommissioning of a nuclear installation has reached a stage where the risks involved are so limited;

CONSIDERING that the technical exclusion criteria provided in its Decision and Recommendation of 20 April 1990 concerning the Application of the Paris Convention to Nuclear Installations in the Process of Decommissioning [NE/M(90)1], which is based on the superseded 1985 Edition together with the 1988 Supplement of the Regulations for the Safe Transport of Radioactive Material of the International Atomic Energy Agency, are no longer appropriate;

NOTING the attached Explanatory Note;

DECIDES that any Contracting Party may cease to apply the Paris Convention to a nuclear installation in the process of being decommissioned, provided that the provisions set out in the Annex to this Decision and Recommendation and any additional conditions which the Contracting Party may judge appropriate to establish are met;

DECIDES that the Decision and Recommendation of 20 April 1990 concerning the Application of the Paris Convention to Nuclear Installations in the Process of Decommissioning [NE/M(90)1] is hereby revoked;

RECOMMENDS that the Contracting Parties which make use of this option notify the other Contracting Parties, as well as the Secretariat of the OECD Nuclear Energy Agency; and

RECOMMENDS that the Secretariat of the OECD Nuclear Energy Agency, as appropriate, analyse periodically the experience gained by the Contracting Parties which use this option and report back to all the Contracting Parties.

UK position

- Specialist nuclear regulation considered excessive once nuclear hazards removed and focus shifts to land remediation and conventional health & safety
- Optimisation / sustainability concerns over removing all radioactive materials from a site and transporting them across the country to a disposal site
- Consensus between Government and Industry that a different approach was required
- The new approach was called ‘Proportionate Regulatory Control’ or PRC and aimed to make use of the 2014 Steering Committee Decision
- Development of PRC began in 2016 – legislation yet to come into force

PRC objectives

- Align UK legislation with international standards on nuclear third-party liability
- Ensure that nuclear sites are regulated by the most appropriate regulators during the final stages of nuclear decommissioning and clean-up
- Enable a sustainable approach to waste management

Benefits of PRC

- Allow ONR to concentrate on higher risk sites – especially important given the current and future demands on ONR resource
- Allow operators to work to a single set of land remediation standards
- Avoid unnecessary remedial work, reduce waste volumes (LLW and VLLW) and related costs of land remediation and safeguard capacity at existing disposal facilities

What does PRC look like

- An early delicensing route for ‘low-risk areas’ of existing nuclear sites potentially freeing them up for nuclear new build or a non-nuclear use etc
- Risk from residual radioactivity managed under the environmental permitting regime
- Operators can optimise site end-states on a case-by-case basis
- Cost savings from reduces land remediation, transport and waste disposal costs

How has it been done?

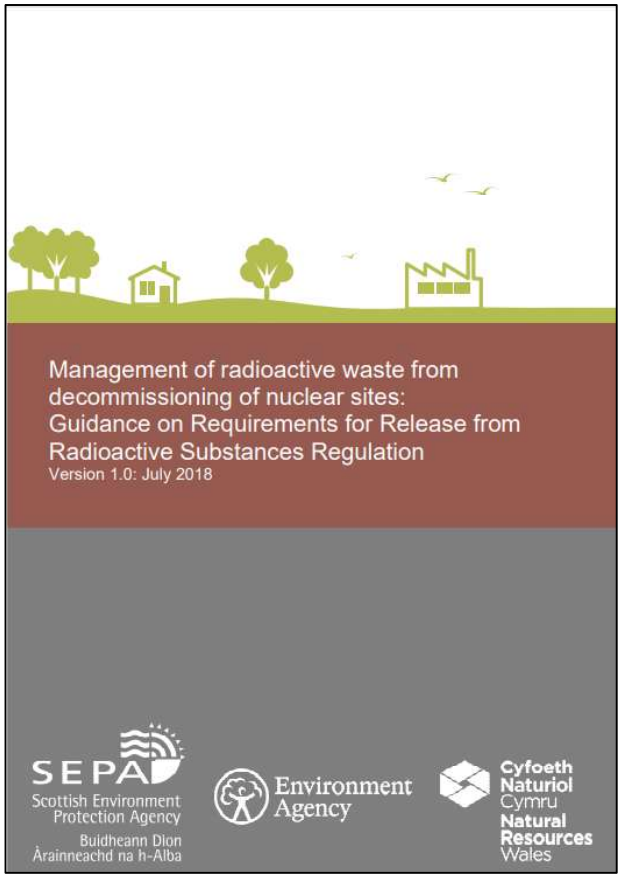
- Consultation in 2018
- Changes to licensing legislation adopted in 2023 but not yet in force
- Liability limits also drop from €1.2 billion to €160 million after de-fuelling

Regulation under an environmental permit / authorisation

- Radioactive substances regulation permit governs the disposal of radioactive waste
- Outside the nuclear liability regime
- Operator requires environmental safety case and is legally bound be permit/authorisation conditions
- Regulated by the environmental regulator

Surrender of environmental permit / authorisation

- Surrender in accordance with the Guidance on Requirements for Release from Radioactive Substances Regulation (GRR)
- Requires a Site-Wide Environmental Safety Case and a Waste Management Plan
- Multiple management options possible including:
  - Off-site disposal
  - Dedicated waste disposal facility
  - In-situ disposal with or without engineered barriers
  - Disposal to fill underground structures or voids
  - Screening bunds
  - In-situ contamination
- The 2018 GRR is under review



Example of progress

- Regulation reasonable and proportionate to the risk profile of the site
- Removal of 88 legacy regulatory requirements to boost efficiency, proportionality and deliver cost and time benefits
- Withdrawal of rules that no longer contribute to safety due to decreasing risk profiles at 10 decommissioning sites across England, Scotland and Wales
- Approvals and specifications withdrawn through formal variation of the Nuclear Site Licence

Ongoing / upcoming challenges

- Imminent transfer of 7 x Advanced Gas Cooled Reactors from EDF to Nuclear Restoration Services – starting with Hunterston B
- Merging of defence and civil decommissioning
- The regulation of groundwater
- Impacts of coastal erosion Regulation of non-radioactive hazardous wastes

Wider issues

- Constrained public spending
- Drive for innovation in decommissioning – saving time and cost
- Demand for land for new nuclear facilities: SMRs, fuel, defence
- Consultation to update environmental permitting regime
- Focus on avoiding a ‘nuclear premium’
- *‘enable innovation, while maintaining high standards of safety and security’* – ONR approach to enabling regulation
- Counter pressure to tighten enforcement

Key findings of the Interim Review

- Risk management and proportionality – application of ALARP
- Complexity of the regulatory and planning landscape – complexity and inconsistency
- Enabling delivery in planning regime – disproportionate and ineffective for SMRs/AMRs
- Capacity, capability, culture – scarcity of SQEP workforce
- International harmonisation
- Insufficient understanding of the cost of delays by regulators
- Recommendation that Government provides *a strategic steer to communicate a clear set of national priorities for regulators outlining economic, environmental and societal benefits of efficient large-scale delivery, driving the cultural changes needed to achieve it and upholding independent regulatory decision-making*

The Burges Salmon Guide to Nuclear Law

Please register your interest for a free copy here:

Burges Salmon Guide to Nuclear Law Edition 3

Questions?

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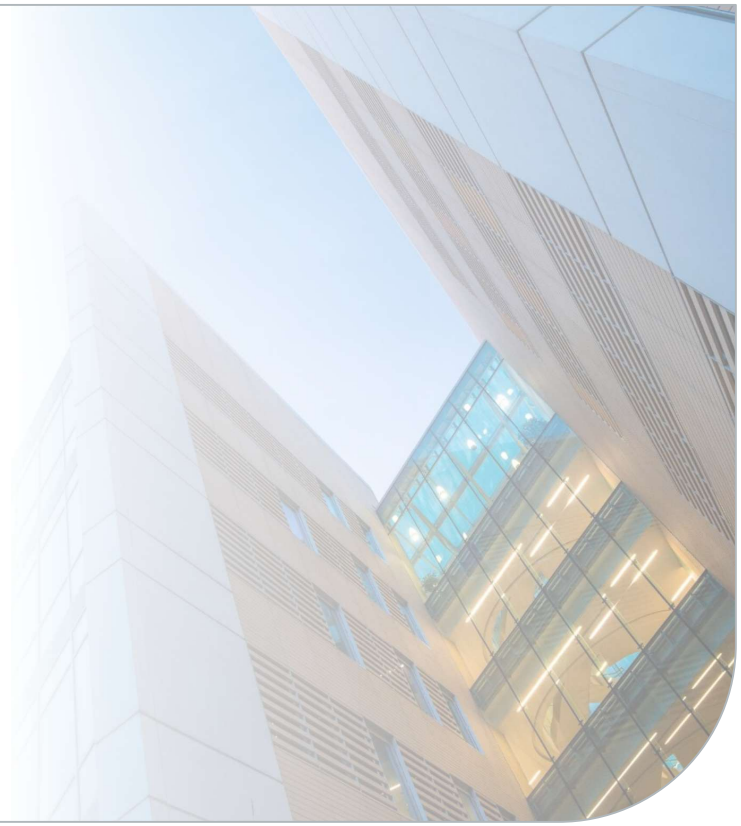

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CSC – AN OPPORTUNITY OR UNNECESSARY BURDEN?

A CASE STUDY BASED ON POLAND

Patrycja Nowakowska
counsel, attorney-at-law
Energy & Natural Resources Practice Expert

CURRENT NUCLEAR PROJECT IN POLAND

FIRST POLISH NPP

LARGE-SCALE NUCLEAR POWER PLANT IN CHOCZEWO

Investment led by Polskie Elektrownie Jądrowe (PEJ) in cooperation with the Westinghouse-Bechtel consortium.

The project is currently at the licensing preparation stage.

EPC (Engineering, Procurement, Construction) contract not yet singned, but in the phase of negotation.

FIRST POLISH SMR

BWRX-300 MODULAR REACTORS

Implemented by Orlen Synthos Green Energy (OSGE), joint venture of Orlen and Synthos.

Goal: Build two reactors by 2035 near partners industrial facilities (e.g. in Włocławek and Oświęcim).

ON THE CSC IN THE DRAFT UPDATE OF THE POLISH NUCLEAR POWER PROGRAM

The Polish Nuclear Power Program for the first time addresses the issue of nuclear risk insurance and legal framework concerning civil liability for nuclear damage.

Insurers and investors highlight the need for amendments to the Atomic Law regarding civil liability for nuclear damage, as well as Poland's accession to the CSC in order to regulate liability issues in relations with supplier states.

The Ministry announces an analysis of legal solutions and alternative financial security systems aimed at reducing the burden on the State Treasury.

The legal form and operating principles of a national insurance pool, if established, will be developed by entities from the Polish insurance market.

The government will prepare the necessary legislative changes.

POTENTIAL SELECTED EFFECTS OF ACCESSION TO THE CSC

- Accession to the same international legal instrument of which the technology supplier's state is a party may improve Poland's negotiating position in concluded contracts.
- Increased legal certainty for all entities involved in the investment. Polish law and the jurisdiction of Polish courts, as the state of the nuclear incident, would apply to resolving disputes arising from nuclear damage.
- Participation of the United States in covering damage resulting from a nuclear accident in a nuclear installation on Polish territory, if the damages exceeded the amount available from national resources.
- It may have a positive impact on accessing debt financing. In particular, the first Polish NPP is expected to secure financing from export credit agencies based in the United States and Canada. This factor may also be of significance to lenders.
- Accession to the CSC would primarily improve the situation of a technology supplier by excluding its liability.
- Increased financial burden for Poland. If the contribution were to be covered by operators, this would affect the operating costs of the nuclear power plant and would likely increase the insurance premium.
- The greater the installed nuclear capacity in Poland, the greater the financial burden for Poland.

THANK YOU FOR YOUR ATTENTION

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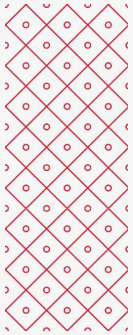

INLA SPAIN Nuclear Law Breakfast/Debate

Microreactors for the moon (and other celestial bodies)

A new race to the Moon!

United States of America

- In 2022, NASA awarded contracts to Lockheed Martin, Westinghouse and IX, a collaboration between Intuitive Machines and X-Energy.
- The first phase was completed in February 2024 with the submission of designs for a reactor that could sustain a habitable moon base for at least a decade.

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United Kingdom:

- In March 2024, the Space Agency also announced new funding of £ 2.9 ($3.6m) for the demonstration of a lunar modular nuclear reactor. After an initial study in 2022, the collaboration between UK industry and academics is being led by Rolls-Royce.
- The Rolls Royce micro-reactor programme is currently in the concept development phase. Testing is being done on prototype components and the aim is to have a demonstration model ready for lunar delivery by 2029.

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01

国际月球科研站的定义、组成和发展阶段

国际月球科研站的概念设计

国际月球科研站将在一个（或多个）位置的概念设计如图 1 所示。

图 1 国际月球科研站概念图

Russian Federation / China:

- In March 2024, the Russian space agency, Roscosmos, announced that it will build a lunar modular reactor together with the China National Space Administration by 2035 to power a joint Chinese – Russian moon base.

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Do we have legal rules for operating microreactors on celestial bodies?

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❑ *International Nuclear Law (= earth and sea)*

X

(Outer Space and celestial bodies=)

❑ *Principles Relevant to the Use of Nuclear Power Sources in Outer Space*

❑ *Safety Framework for Nuclear Power Source Applications in Outer Space (Safety Framework), which has been adopted jointly by the United Nations Committee on the Peaceful Uses of Outer Space Scientific and the IAEA*

Do we need a legal framework for nuclear power production on celestrial bodies?

Univerzita Karlova

- *Specifics of nuclear safety in Outer Space, remote surveillance and AI*
- *Nature and character of potential nuclear damages in Outer Space*
- *How to manage nuclear waste in Outer Space???*

Thank you for your kind attention!

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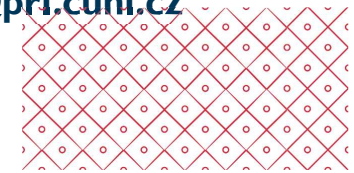
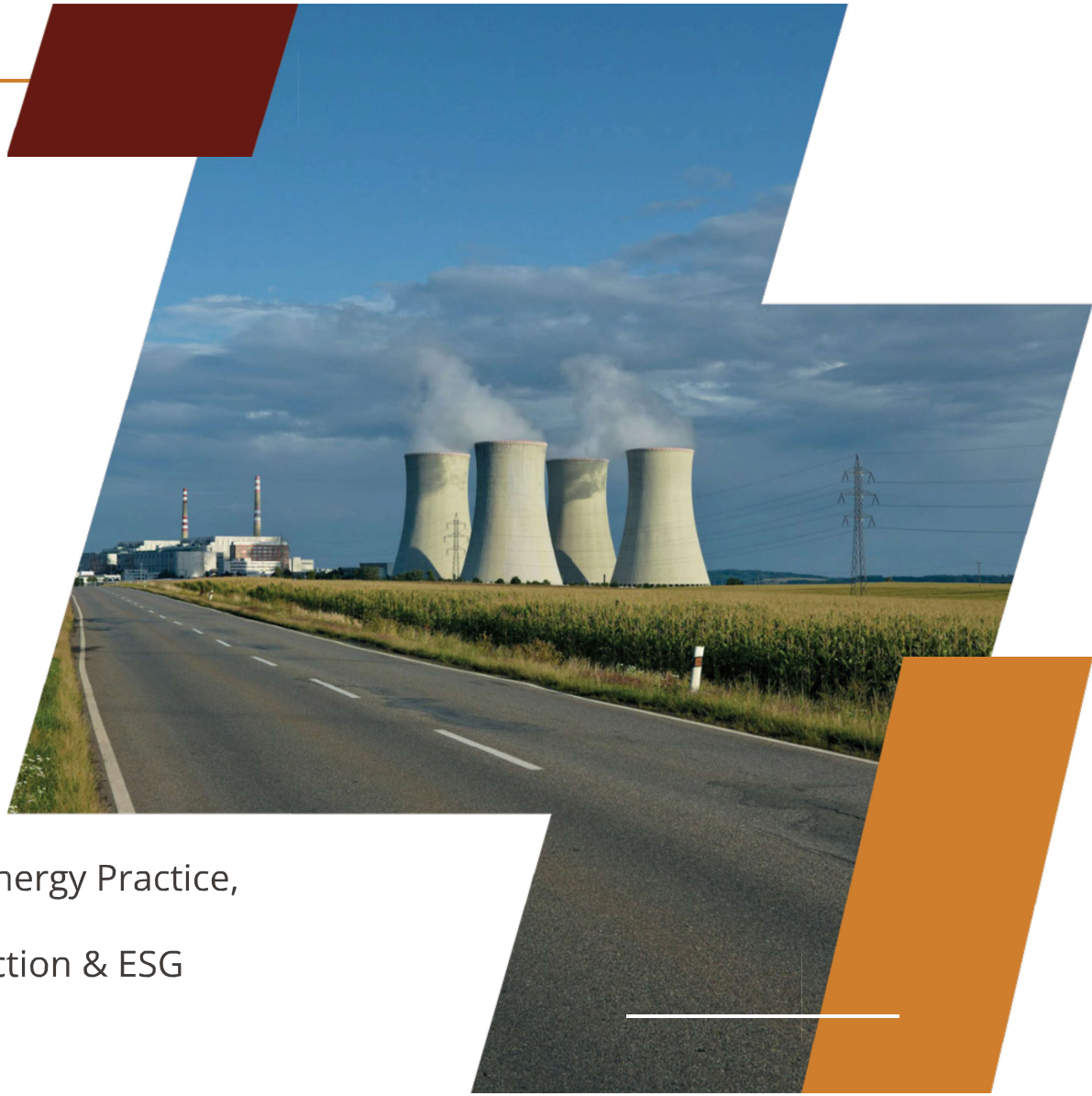


kochański & partners Business Law Firm

STREAMLINING NUCLEAR LICENSING WITH RELIANCE-BASED APPROACH



Łukasz Młynarkiewicz, PhD

Attorney-at-Law, Partner, Head of Nuclear Energy Practice,

Energy, Infrastructure, Environmental Protection & ESG Group of Practices

THE STRATEGIC IMPERATIVE – WHY NOW?

THE CHALLENGE: THE GLOBAL ENERGY TRANSITION, DECARBONIZATION, AND THE NEED FOR ENERGY SECURITY REQUIRE URGENT, LARGE-SCALE ACTION

THE SOLUTION: NUCLEAR ENERGY, INCLUDING SMALL MODULAR REACTORS (SMRS), IS A KEY, STABLE, AND ZERO-EMISSION COMPONENT OF THE FUTURE ENERGY MIX

THE PROBLEM: TRADITIONAL, ISOLATED NATIONAL LICENSING PROCESSES ARE A CRITICAL BOTTLENECK, CAUSING DELAYS AND COSTS

THE BOTTLENECK: FLAWS OF THE TRADITIONAL LICENSING MODEL

Duplication of Effort: The same or very similar reactor designs are repeatedly assessed from scratch by different countries.

Waste of Resources: Limited global pool of top-tier nuclear experts repeats the same, time-consuming analyses.

Barriers to Standardization: National regulatory differences force costly design modifications, undermining SMR benefits like economies of scale and serial production.

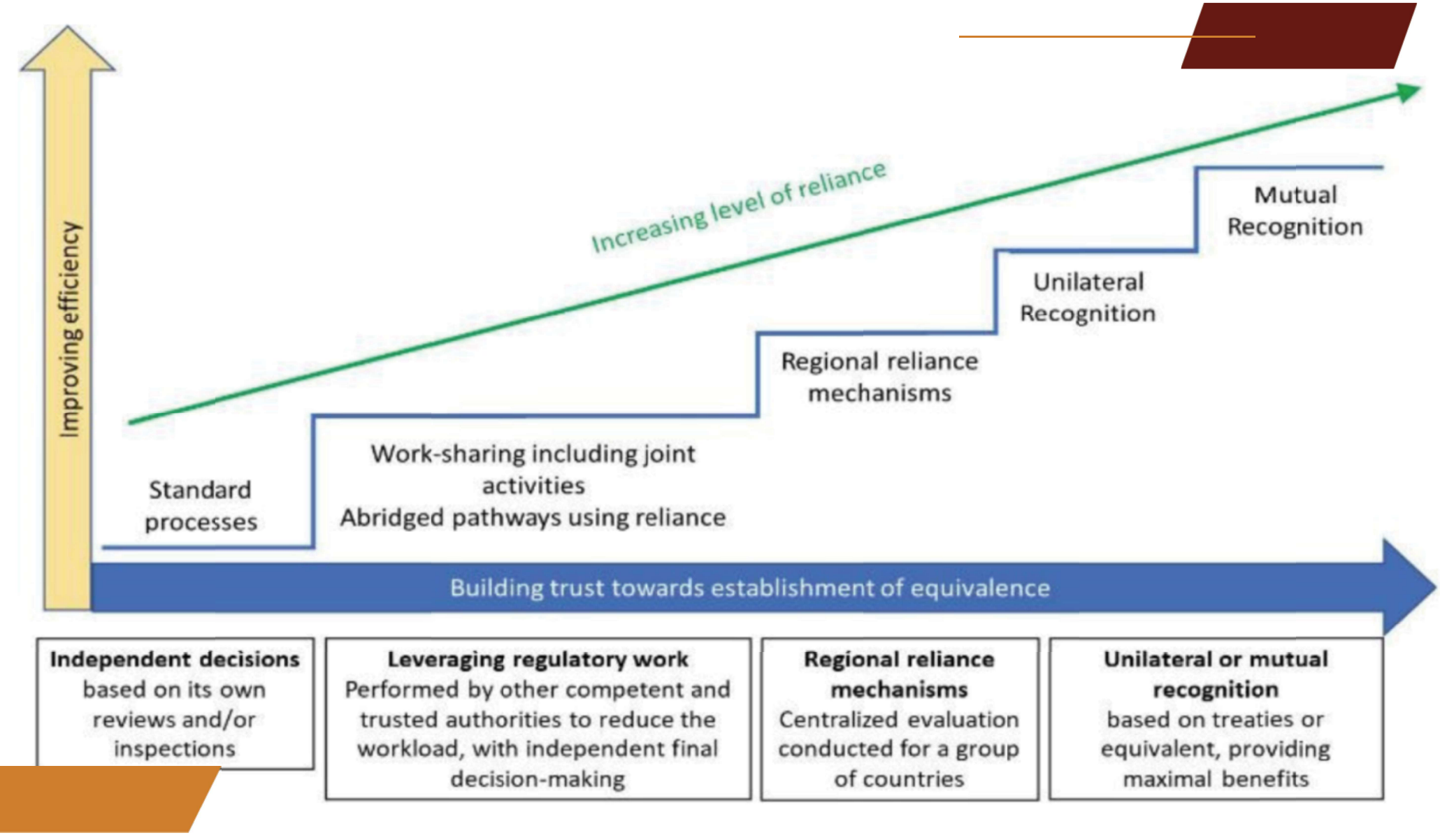
Conclusion: The current licensing model is inefficient and unsustainable in the era of globalized nuclear technology.

THE "NOT-NEW" PARADIGM: THE RELIANCE-BASED APPROACH

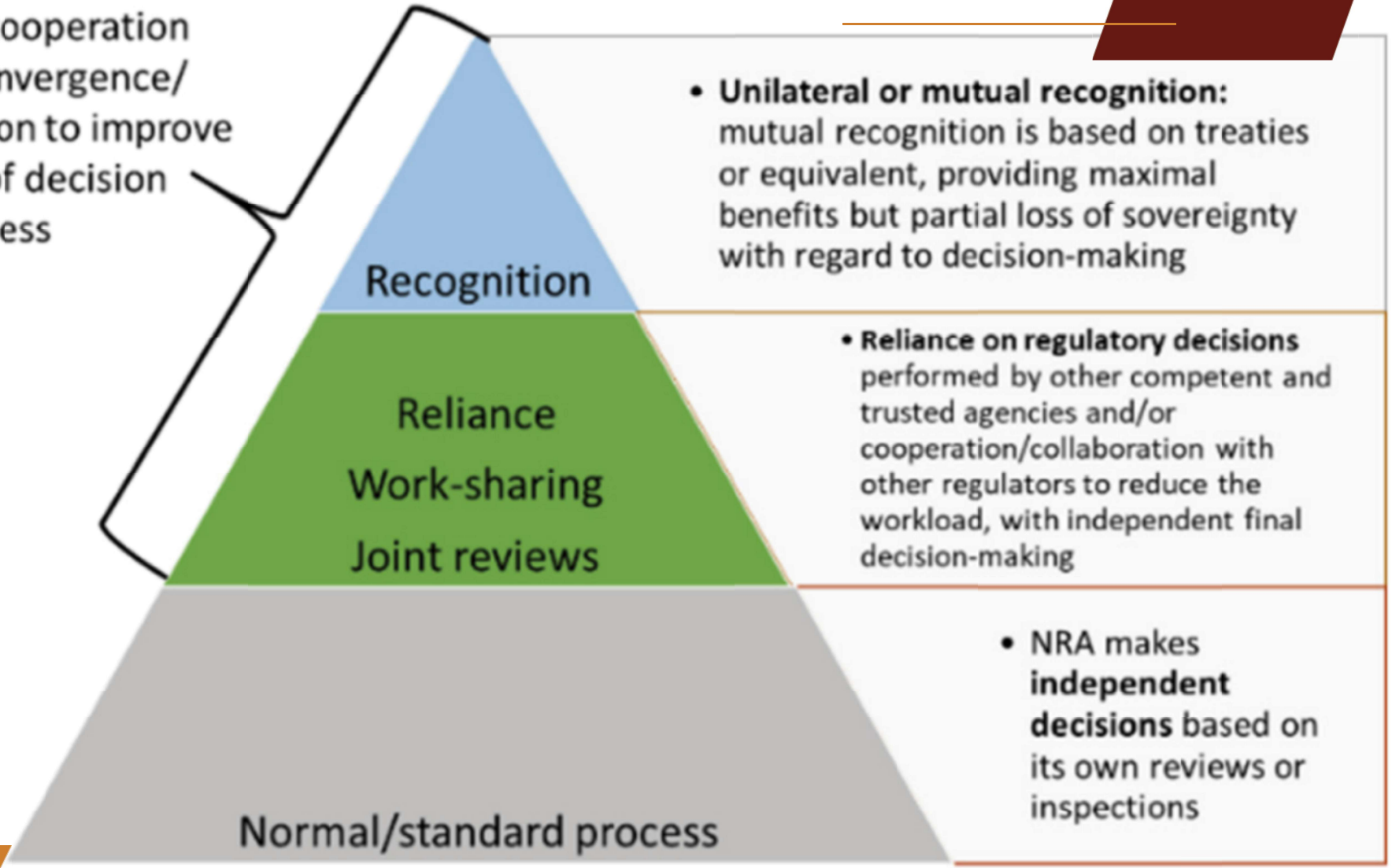
Definition (per WHO): The act whereby the regulatory authority in one jurisdiction may take into account and give significant weight to assessments performed by another regulatory authority or trusted institution, in reaching its own decision.

Key Principle: This is NOT outsourcing responsibility for safety; it is a smarter, more effective, and modern form of regulatory oversight.

Proof-of-Concept: A proven and effective model in other globally regulated, high-risk sectors, such as the pharmaceutical industry.


Improving efficiency
Increasing level of reliance
Standard processes
Work-sharing including joint activities
Abridged pathways using reliance
Regional reliance mechanisms
Unilateral Recognition
Mutual Recognition
Building trust towards establishment of equivalence
Independent decisions based on its own reviews and/or inspections
Leveraging regulatory work Performed by other competent and trusted authorities to reduce the workload, with independent final decision-making
Regional reliance mechanisms Centralized evaluation conducted for a group of countries
Unilateral or mutual recognition based on treaties or equivalent, providing maximal benefits

Regulatory cooperation based on convergence/ harmonization to improve the quality of decision making process



KEY CONCEPTS & PRINCIPLES

Spectrum of Cooperation

- **Harmonization:** Identical standards and procedures.
- **Convergence:** Gradual alignment of requirements over time.
- **Reliance:** Using another authority's work to inform one's own decision.
- **Recognition:** Routine acceptance of another authority's decision.

Fundamental Principles of Implementation

- **Sovereign Decision-Making:** The final decision and accountability always remain with the national regulator.
- **Transparency:** Clear, publicly available processes and criteria.
- **Legal Basis:** A clear mandate for the regulator in national law.
- **Competence:** The ability to critically assess a partner's work (the informed customer capability).

MODELS OF COOPERATION IN THE NUCLEAR SECTOR (PER IAEA NHSI)

IAEA NHSI Initiative

A global forum for regulators and industry to cooperate on harmonizing and standardizing SMRs

Three Main Cooperation Models

- **Leveraging:** A regulator uses the assessment of a reference regulator
- **Collaborative Review:** regulators conduct parallel, independent assessments with intensive cooperation
- **Joint Review:** A joint team of experts conducts one, common assessment against a common reference framework

Resource Efficiency Ranking

- **Joint Review**
- **Leveraging**
- **Collaborative Review**

A PRACTICAL ROADMAP: THE 6-STEP "LEVERAGING" PROCESS (IAEA)

1

Identify a relevant reference regulator

Select the regulator whose work is applicable and reliable for leveraging.

2

Understand divergences between regulatory systems

Analyze differences in rules, standards, and approaches between your system and the reference regulator.

3

Assess impact of divergences on leveraged information

Evaluate how these differences affect the validity and applicability of the referenced work.

4

Assess the quality of work by the reference regulator

Review the thoroughness, accuracy, and credibility of the referenced regulatory work.

5

Categorize information

Type 1: Needs further analysis before use**Type 2:** Can be directly used in your assessment

6

Document use of leveraged information

Record how the referenced work was incorporated in the final assessment report for transparency and accountability.

STRATEGIC PHASED IMPLEMENTATION ROADMAP

Phase 1: Building Foundations (Years 1-2)

- Amend national atomic/nuclear law to create a mandate for the National Regulatory Authority (NRA)
- Actively participate in NHSI, workshops, and staff exchanges to develop competencies
- Sign Memoranda of Cooperation (MoU) with key partner regulators to establish relationships

Phase 2: Piloting and Testing (Years 2-4)

- Select a pilot SMR project and conduct a Collaborative Review with a partner
- Analyze lessons learned and identify best practices from pilot activities

Phase 3: Scaling and Formalization (Years 4+)

- Expand the scope to other projects to broaden regulatory oversight
- Aim for participation in Joint Reviews to formalize collaborative regulatory processes

FORESEEN BARRIERS AND CHALLENGES

Legal & Sovereignty

- Lack of a clear legal basis in national atomic law
- Concerns about "losing sovereignty" and accountability for safety

Technical & Procedural

- Divergences in technical requirements and standards
- The problem of ensuring project "sameness"

Organizational & Resource

- The need to build new competencies within the NRA
- Potential internal resistance to change

Political & Social

- The need to secure strong and consistent political will
- Risk of negative public perception ("lowering safety standards")

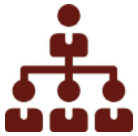
OVERCOMING BARRIERS: KEY RECOMMENDATIONS

1 Legal Actions

Amend national atomic law to grant the head of the NRA a flexible but clearly defined mandate to use reliance

2 Strategic Actions

- Actively engage in the IAEA NHSI initiative
- Select technologies with mature regulatory assessment in a reference country



3 Organizational Actions (for the NRA)

- Create a dedicated team for international cooperation
- Implement a competency-building program

4 Communication

Develop a proactive public communication strategy framing reliance as a means to achieve higher safety by leveraging global expertise

SUMMARY OF BENEFITS: WHY IT'S WORTH IT

Accelerated Timelines: Significantly shorten national licensing processes and speed up the achievement of energy policy goals

Resource Optimization: The National Regulatory Authority (NRA) focuses unique resources on nation-specific aspects like siting, grid integration, and construction oversight

Enhanced Quality and Safety: National assessments gain depth and comprehensiveness through the expertise of the world's best regulators, improving project verification

THANK YOU FOR YOUR ATTENTION

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QUESTIONS FOR DISCUSSION

1

How should countries, especially newcomers to nuclear power, decide between actively participating in **joint reviews** versus focusing on effectively **leveraging** others' assessments?

2

What specific changes in **national atomic law** are necessary to provide the **NRA** with flexibility while safeguarding sovereign decision-making?

3

What is the greatest, underappreciated **risk** of implementing a **reliance-based approach**, and how can it be proactively **mitigated**?

4

Given that full **international harmonization** is a long-term goal, how can **divergences** between national requirements and those of a reference regulator be **managed in practice**?

5

How can **national industry and investors** actively support the implementation of a **reliance-based approach**?

Evaluation of the Radioactive Waste Directive and the Shipment Directive

Necessity

- 19 years have passed since the entry into force of the Shipment Directive and 14 since the entry into force of the Radioactive Waste Directive
- The third Report from the Commission to the Council and the European Parliament on progress of implementation of Council Directive 2011/70/Euratom and inventory of radioactive waste and spent fuel present in the Community's territory and future prospects (COM(2024) 197 final called for an evaluation.

Third Report on the RWD - National programmes – status and key findings

- National programme are established, one third of them updated during the reporting period.
- No significant development in practice towards a shared solution for disposal despite Member State interest.
- Some national programmes detail activities only for a specific timeframe, mostly 5 to 10-years.
- Programmes' updates have mostly resulted in pushing milestones to a later time.

Third Report on the RWD - Conclusions I

- Radioactive waste and spent fuel were managed safely in the Member States in the reporting period
- National programmes are in place and established in a transparent and participative manner.
- The system of self-assessments and international peer reviews funtions generally well
- Increasing amounts of disposed waste

- **However, the rate of addressing key challenges remained generally slow, and few changes can be reported in relation to the previous report**

Third Report on the RWD -Conclusions II

- Main issues:
  - Several Member States still did not further define national policies for the long-term management of all their radioactive waste
  - The targets set in some national programmes are not sufficiently ambitious
  - Programms control and funding, incomprehensive assessment of costs.
  - The use of key performance indicators should be improved.
- The transposition and implementation of the Directive in the Member States have not to date fully achieved the Directive's objectives for all categories of radioactive waste.
- This calls for a more thorough evaluation of the Directive's effectiveness

Procedure

- The evaluation should gather robust evidence and implement systemic assessment of the Radioactive Waste Directive and the Shipment Directive.
- The implementation of the Directives is evaluated against their objectives in light of five criteria: effectiveness, efficiency, relevance, coherence, EU added value in accordance with the Better Regulation guidelines
- Stakeholder interviews, public consultation, call for evidence, input from different fora (like ENSREG WG2, Nuclear Backend Financial Aspects expert group)
- The planned adoption is in Q4 2026.