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Automating Compliance

Integrating information on Legal Requirements in Advanced Plant Information Systems for Nuclear Decommissioning and Life-cycle Management

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Advanced Plant Information Management Methods

The scope and duration of decommissioning activities demand an integrated management system (IAEA SSG-47 art. 4.1)

- Safety management / compliance
- Project management
  - Work breakdown
  - Scheduling
  - Cost control
- Information sharing (regulators and contractors)
- Training

Integrated systems may provide 3D models based on physical attributes of the environment, and real time adaption and presentation of relevant meta information to calculated changes

Aim of the presentation is to address the opportunities and challenges of including information on contractual and regulatory requirements in adaptive plant information systems

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Standard information management

Standard approach

- Analyse legal instruments
- Develop new documents with detailed requirements
  - Operating procedures
  - Safety guidelines
  - Checklists and forms
- Upload documents to information management system
- Instruct workers to comply with procedures described in information management system

The information management system consists of a static collection of extensive documentation

The system does not detect the relevance or significance of any given procedure or requirement

Human error = non-compliance

Input

- Legal instruments
- Operating procedures
- Safety guidelines
- Checklists
- Risk assessments
- Contracts

Output

- Legal instruments
- Operating procedures
- Safety guidelines
- Checklists
- Risk assessments
- Contracts

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Adaptive plant information system

Operation → Transition period → Decommissioning

Identification
- Facilities
- Tally - Inventory
- Characterization
- Waste routes (WAC)
- Transport
- End-state
- Costs
- Internal resources
- Contractors (T&C)
- Procedures
- Safety standards
- Regulations
- Licenses

Adaptive information system
- Database
- 3D model / BIM
- Education/training modules
- Task simulation
- Safety cases
- Resource management
- Project management
- Document management

Adaptive output
- Work breakdown structure
- Schedule
- Staffing
- Budget
- Deviation alerts

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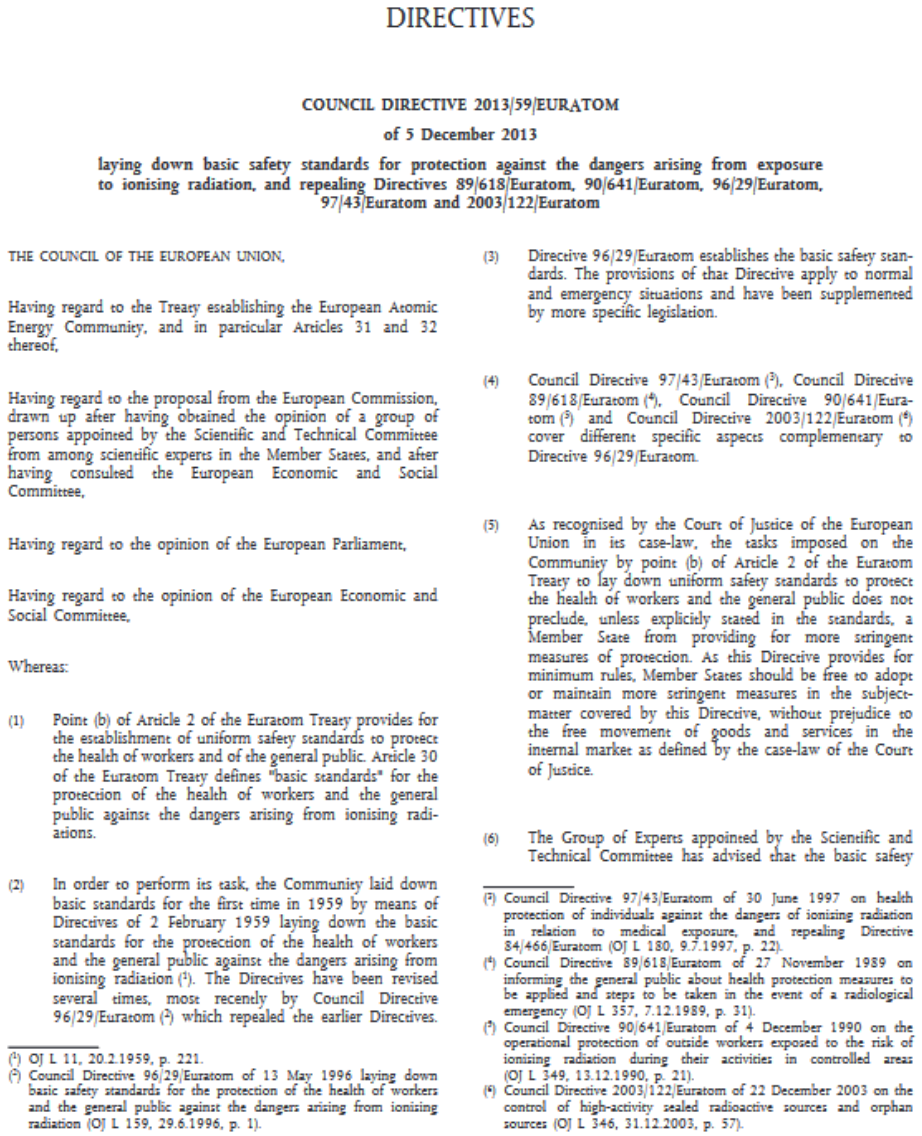
Legal input - Format

- A key challenge for adding a legal dimension to adaptive information management systems is to reduce legal standards and requirements into functional requirements that may be organised in a database with relevant triggers/tags

- The original format of legal information does not lend itself easily to structured information management
  - Legal writing is more systematic than standard prose
  - However, regulations, licenses and guidelines are still drafted in a relatively holistic manner



DIRECTIVES

COUNCIL DIRECTIVE 2013/59/EURATOM

of 5 December 2013

laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Articles 31 and 32 thereof,

Having regard to the proposal from the European Commission, drawn up after having obtained the opinion of a group of persons appointed by the Scientific and Technical Committee from among scientific experts in the Member States, and after having consulted the European Economic and Social Committee,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the European Economic and Social Committee,

Whereas:

(1) Point (b) of Article 2 of the Euratom Treaty provides for the establishment of uniform safety standards to protect the health of workers and of the general public. Article 30 of the Euratom Treaty defines "basic standards" for the protection of the health of workers and the general public against the dangers arising from ionising radiations.

(2) In order to perform its task, the Community laid down basic standards for the first time in 1959 by means of Directives of 2 February 1959 laying down the basic standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation [1]. The Directives have been revised several times, most recently by Council Directive 96/29/Euratom [2] which repealed the earlier Directives.

(3) Directive 96/29/Euratom establishes the basic safety standards. The provisions of that Directive apply to normal and emergency situations and have been supplemented by more specific legislation.

(4) Council Directive 97/43/Euratom [3], Council Directive 89/618/Euratom [4], Council Directive 90/641/Euratom [5] and Council Directive 2003/122/Euratom [6] cover different specific aspects complementary to Directive 96/29/Euratom.

(5) As recognised by the Court of Justice of the European Union in its case-law, the tasks imposed on the Community by point (b) of Article 2 of the Euratom Treaty to lay down uniform safety standards to protect the health of workers and the general public does not preclude, unless explicitly stated in the standards, a Member State from providing for more stringent measures of protection. As this Directive provides for minimum rules, Member States should be free to adopt or maintain more stringent measures in the subject-matter covered by this Directive, without prejudice to the free movement of goods and services in the internal market as defined by the case-law of the Court of Justice.

(6) The Group of Experts appointed by the Scientific and Technical Committee has advised that the basic safety

[1] OJ L 11, 20.2.1959, p. 221.
[2] Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation (OJ L 159, 29.6.1996, p. 1).
[3] Council Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 84/466/Euratom (OJ L 180, 9.7.1997, p. 22).
[4] Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency (OJ L 357, 7.12.1989, p. 31).
[5] Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionising radiation during their activities in controlled areas (OJ L 349, 13.12.1990, p. 21).
[6] Council Directive 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources (OJ L 346, 31.12.2003, p. 57).

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Legal input – Where to start? (Q&A)

- The underlying structure of legal information is generally based on logical conditional arguments (if-then)
- However, extensive work is required to reduce official legal texts to precise logical statements
- This raises some fundamental questions:
  - Is such precise logic necessary for the system?
  - What is the preferred and/or required format?
  - Can artificial intelligence assist the process?
  - Is it possible to prioritize legal information based on cost/benefit to the system

Norwegian regulation on radiation protection § 32

"The operator shall ensure that all exposure to radiation is kept as low as practically possible, and that the following dose limits are not exceeded:

(a) Effective dose for occupationally exposed employees shall not exceed 20 mSv per year"

An attempt at logic structure

1. If a task may be achieved by alternative operations then recommend alternative with the lowest risk of radiation exposure to affected workers
2. If the effective radiation dose of operation exceeds 20 mSv then recommend replanning of task
3. If the employee's effective radiation dose the preceding 12 months plus the effective radiation dose of operation exceeds 20 mSv then recommend replanning of task or replacement of employee

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Legal Input – Cost / Benefit

Discretionary assessments

- ALARA
- BAP
- Fit for purpose

Objective standards

- Deadlines
  - Notification to/from contractors
  - Notification/reports to authorities
  - Delivery milestones
- Measurable physical attributes
  - Waste acceptance criteria
  - Permitted radiation levels
  - Required shielding material
- Existence of documentation
  - Status of permit / license
  - Existence of necessary records
  - Status of contracts
  - Existence of change orders

IAEA Safety Standards Series No. SF-1

3.21. The safety measures that are applied to facilities and activities that give rise to radiation risks are considered optimized if they provide the highest level of safety that can reasonably be achieved throughout the lifetime of the facility or activity, without unduly limiting its utilization.

IAEA Specific Safety Guide No. SSG-47

8.17. *Decommissioning actions might involve the deliberate removal of SSCs that fulfilled specific safety functions during operation of the facility (e.g. confinement, shielding, ventilation and cooling). Such actions should be recorded and aligned with the ongoing decommissioning phases, work packages and tasks identified in the final decommissioning plan*

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Legal output

Drafting contracts:

Contractors may in tender submit correctly formatted data directly to interactive models

Key elements of the contracts may be defined by reference to the interactive models, e.g.:

- Scope of work - Tally
- Schedule
- Regulatory requirements

Change management:

- System automatically reports the effects of new information:
  - Inventory, radiation levels or other physical attributes
  - Technical execution
  - Regulatory requirements
  - Overall schedule
  - Costs
  - Receipt of deliverables (reports, milestones)
- New tasks / work package may be identified
- Proposed positive changes (project optimisation) may be used in IPD models
- Change order procedure in affected contracts may be triggered and recorded
- Procedure to obtain regulatory approval and update regulatory requirements may be triggered and recorded.

Change Procedure

(Ticket #7231)

Registered change in «Project Schedule» affects agreed schedule for the following contracts:

(1) IFE:31455 – Structure reinforcement
(2) IFE:31273 – Security
(3) IFE:31244 – Transport

Affected schedules must be updated and cost allocated.

Registered change in «Project Schedule» affects the following regulatory requirements:

(1) SSV:20229 – Final report decom alpha lab

Deviation must be approved by relevant authority and regulatory requirement updated.

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Negota in brief

- Advokatfirmaet Negota AS is a Halden based law firm established in 2010, with a branch office in Oslo
- Our clients consist of medium and large Norwegian and international businesses, and are largely based in the energy sectors (oil & gas, hydro, wind and nuclear).
- The firm offers specialised legal advice on commercial contracts, public procurement and regulatory issues (including nuclear law)
- In addition to traditional legal services, a number of our emloyees provide contract managemnent as an «in-house» consultant service to our clients
- We are the only Norwegian firm with a number of our employees being members of the International Nuclear Lawyers Association

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Les mer

09.01.2019