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Safety regulation in a contradictory industrial and socio-political environment

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1 | Nuclear & Radiological Protection in Spain

- 7 REACTORS in operation (5 sites)
- 1 FUEL MANUFACTURING PLANT
- 2 NPP: 1 NPP UNDER DEFERRED DISMANTLING + 1 NPP UNDER DECOMMISSIONING
- 1 NPP HAS CEASED OPERATION (Garona)
- 1 Low Level WASTE DISPOSAL facility
- 1 High Level Waste CENTRALIZED TEMPORARY STORAGE facility being licensed

Environmental control & monitoring (43 automatic stations)

- 840 Commercial and Industrial Radioactive Installations
- 188 Research and educational RI (Ciemat, ALBA, etc)
- 360 Medicine RI (Ciclotron, PET, Linear acc., etc)
- 34.592 X Rays
- 105.693 Exposed workers

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2 | Spanish CSN

- NPPs require **license renewal** every ten years
- CSN uses the **standards** from the technology country of origin (USA, Germany)
- However we introduce a **conditioned application of new standards**: introduction of new requirements for most relevant issues (exceeding the basic parameters of applicability to the NPP according to its design, type or date of construction). Its application depends on the previous analysis by the licensee and on approval by the CSN.
- Life extension**: Regulator imposes technical requirements after an Aging Management Review. However the final decision is a political one (co decision)

Regulatory Body (CSN):

- Independent from Government. Reports to the Spanish Parliament
- Financed by licensees' fees
- Board composed by 5 members
- CSN Board adopts around **450 decisions** per year
- Staff: 454 People, 66% with higher university degree
- Around 2.100 **inspections** per year. Resident inspectors (2 at each plant) + Specific inspection programmes

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3 | Squaring the circle?

- Routine oversight v. extreme events?
- Regulatory burden v. adding regulation from lessons learned?
- Peer review pressure v. independence?
- Transparency v. security?
- Public pressure v. industry interests?
- ...

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4 | OVERREGULATION? How licensees see the Regulator

Source: Seguridad Nuclear.com/66

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5 | EXAMPLE OF CONTRADICTION International commitments of a regulator

- Conventions:
 - ✓ Convention on Nuclear Safety
 - ✓ Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
 - ✓ Convention on Physical Protection of Nuclear Material (CPPNM) and Amendment
 - ✓ Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency
 - ✓ Convention on Early Notification of a Nuclear Accident
 - ✓ Convention for the Protection of the marine Environment of the North-East Atlantic (OSPAR Convention). CSN is member of the Convention Committee on Radioactive Substances
- International standards:
 - ✓ IAEA Safety Standards
 - ✓ ICRP
 - ✓ ...
- Other international organizations and forums:
 - ✓ ENSREG
 - ✓ WENRA
 - ✓ INRA
 - ✓ HERCA
 - ✓ NEA
 - ✓ FORO IBEROAMERICANO
 - ✓ ...

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6 | European Regulation & WENRA

Membership

- 17 Members
- 9 Observers

137 NPP in operation

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7 | European Regulation & WENRA

WENRA Reference Levels

- Complete set of 284 Reactor Safety Reference Levels (SRL) published in 2006
- Revised set of 295 SRL based on stakeholder comments published in 2008
 - Implementation >80% in 14 countries, 100% in 8 countries
- Revision of SRL based on lessons from Fukushima started in 2012

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8 | European Regulation & WENRA

WENRA New Reference Levels

346 Safety Reference Levels

Safety Management	A	Safety Policy
	B	Operating Organization
	C	Management System
	D	Training and Authorization of NPP staff
Design	E	Design Basis Envelope for Existing Reactors
	F	Design Extension of Existing Reactors
	G	Safety Classification of Structures, Systems and Components
Operation	H	Operational Limits and Conditions
	I	Ageing Management
	J	System for Investigation of Events and Operational Experience Feedback
	K	Maintenance, In-service Inspection and Functional Testing
Safety verification	LM	Emergency Operating Procedures and Severe Accident Management Guidelines
	N	Contents and updating of Safety Analysis Report
	D	Probabilistic Safety Analysis
	P	Periodic Safety Reviews
	Q	Plant Modifications
Emergency preparedness	R	On-site Emergency Preparedness
	S	Protection against Internal Fires
	T	Natural hazards (new issue after Fukushima)

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9 | CAN WE SPEAK OF REGULATORY EFFICIENCY

- Safety and overregulation are often accused of being an important obstacle to the deployment of the nuclear industry. Is this the case?
- TMI, Chernobyl, Fukushima. Not perceived risks, but real accidents:
 - TMI halted growth of nuclear energy in the US (with a little help from project delays and cost overruns)
 - Chernobyl did a similar thing in Europe
 - Fukushima?

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10 | FUTURE REGULATION: "BUSINESS AS USUAL" RESISTING CHANGE


- Regulation of increasingly old reactors. Lifetime extension, decommissioning, waste management,...
- Growing regulation associated with accidents in existing installations and growing public awareness of risks
- Licensees trying to avoid costs due to competing energy source prices. Growing resistance to backfits or new safety investments.

 THE POSSIBILITY OF REDUCTIONS IN THE REGULATORY BURDEN UNDER THIS SCENARIO IS EXTREMELY OPTIMISTIC

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11 | FUTURE REGULATION: "LEARNING FROM EXPERIENCE" AIMING FOR THE FUTURE

- Past regulatory practices can not be an obstacle for improvements in safety requirements and future regulation
- Talking about f. ex. "Fukushima lessons" means accepting that we have new information which obliges us to make things differently.

 If we aim for a really efficient regulation we have to be courageous enough to accept:

- Regulation needs to be revised in the light of half a century of successes and failures.
- Old reactors need to be upgraded accordingly or be replaced by new designs (nuclear or other)