

TRANSPORT OF RADIOACTIVE MATERIAL IN SPAIN

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Area of Transport and Nuclear Fuel Fabrication
Nuclear Safety Council (CSN)

2 | Where is Spain ?



3 | Nuclear and Radioactive Facilities in Spain

361 Medical radioactive facilities
839 Industrial radioactive facilities
188 Research radioactive facilities



4 | Regulatory Framework - Transport

International Maritime
Dangerous Goods Code

IMDG Code

Technical Instructions for the
safe transport of dangerous
goods by air of the
International Civil Aviation
Organization (ICAO)

ADR

European Agreement concerning
the international carriage of
dangerous goods by road

IAEA Safety Standards
for protecting people and the environment

Regulations for the
Safe Transport of
Radioactive Material
2009 Edition

Safety Requirements
No. TS-R-1

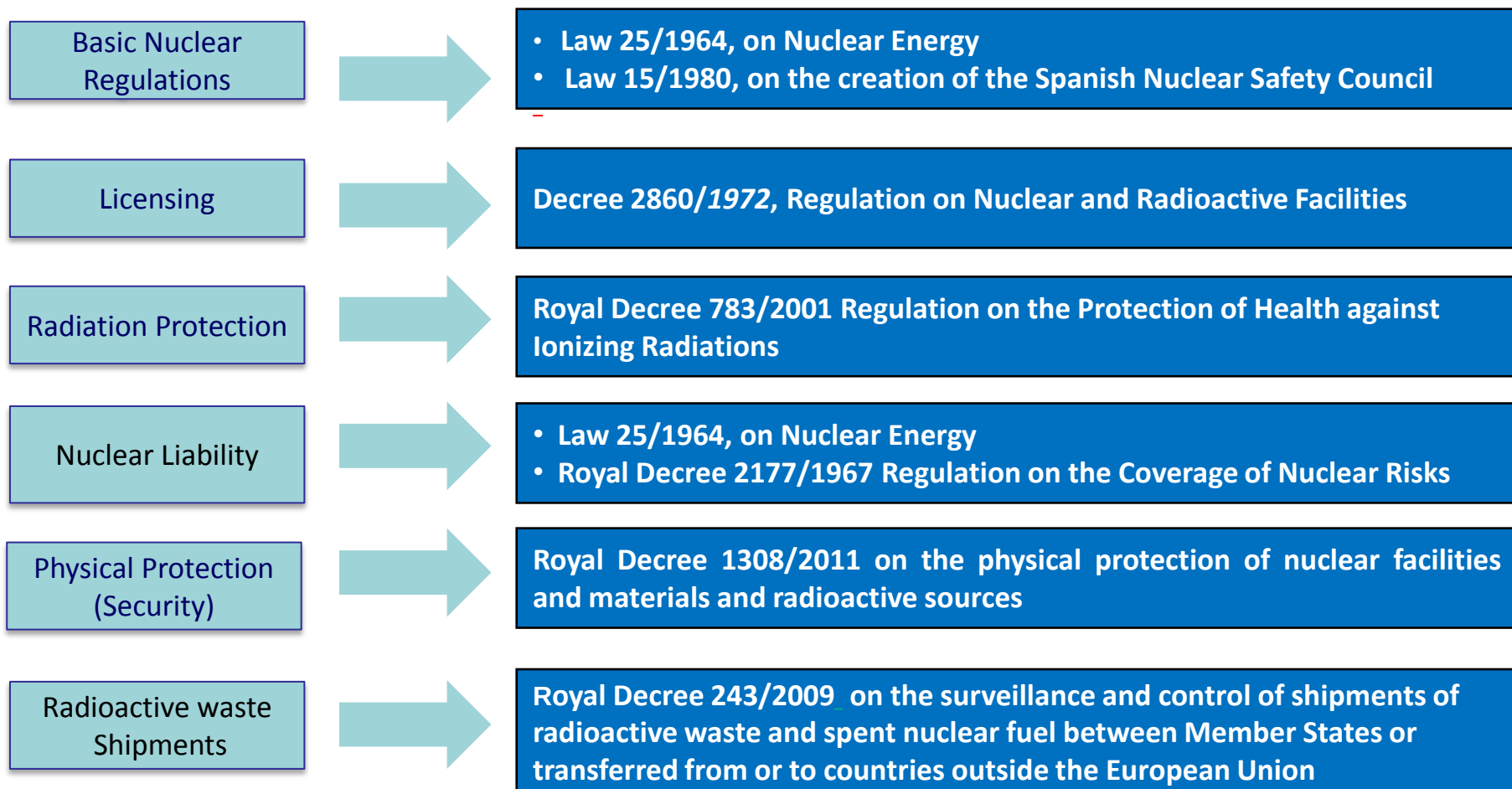


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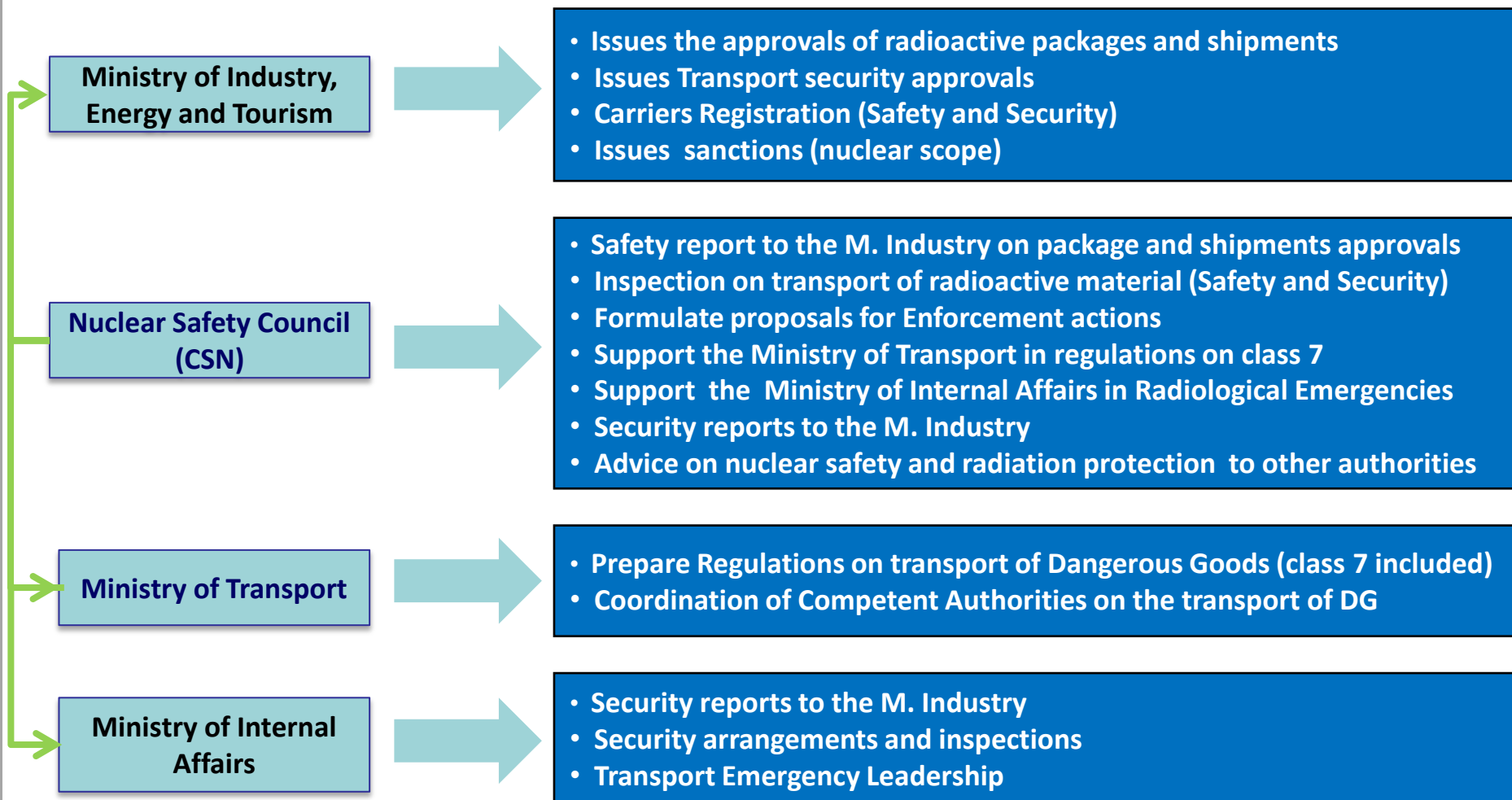
Regulation on the
international transport of
dangerous goods by rail

ICAO TI

5 | Regulatory Framework – Additional Applicable Regulations



6 | Competent Authorities in Transport



7 | Consejo de Seguridad Nuclear (CSN) / Nuclear Safety Council

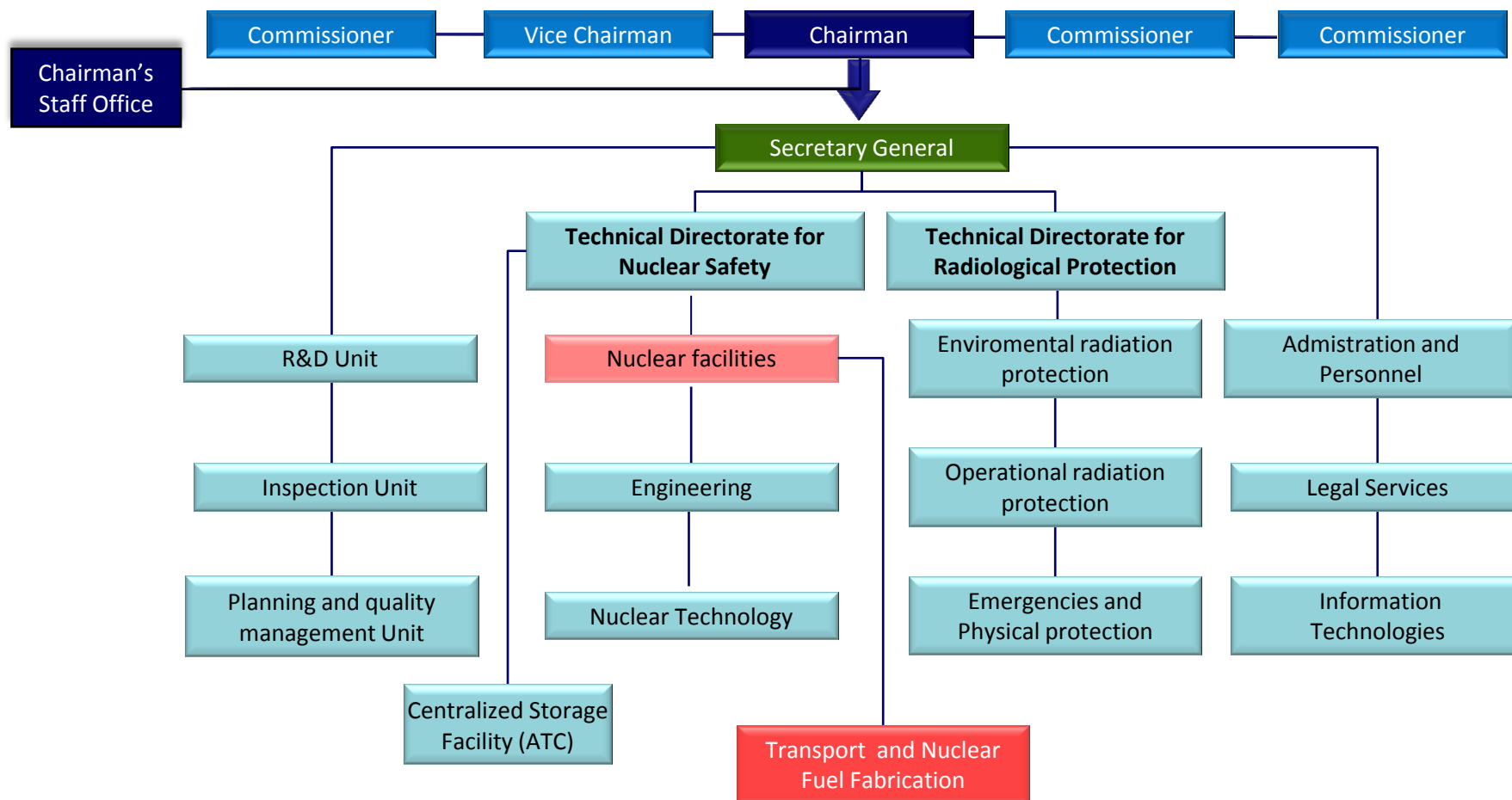
- CSN was created by Law 15/1980
- Sole competent authority in nuclear safety and radiological protection matters.
- Independent from the Government.
- Assets and legal status of its own, financed fundamentally by fees.
- Accountable only to Parliament





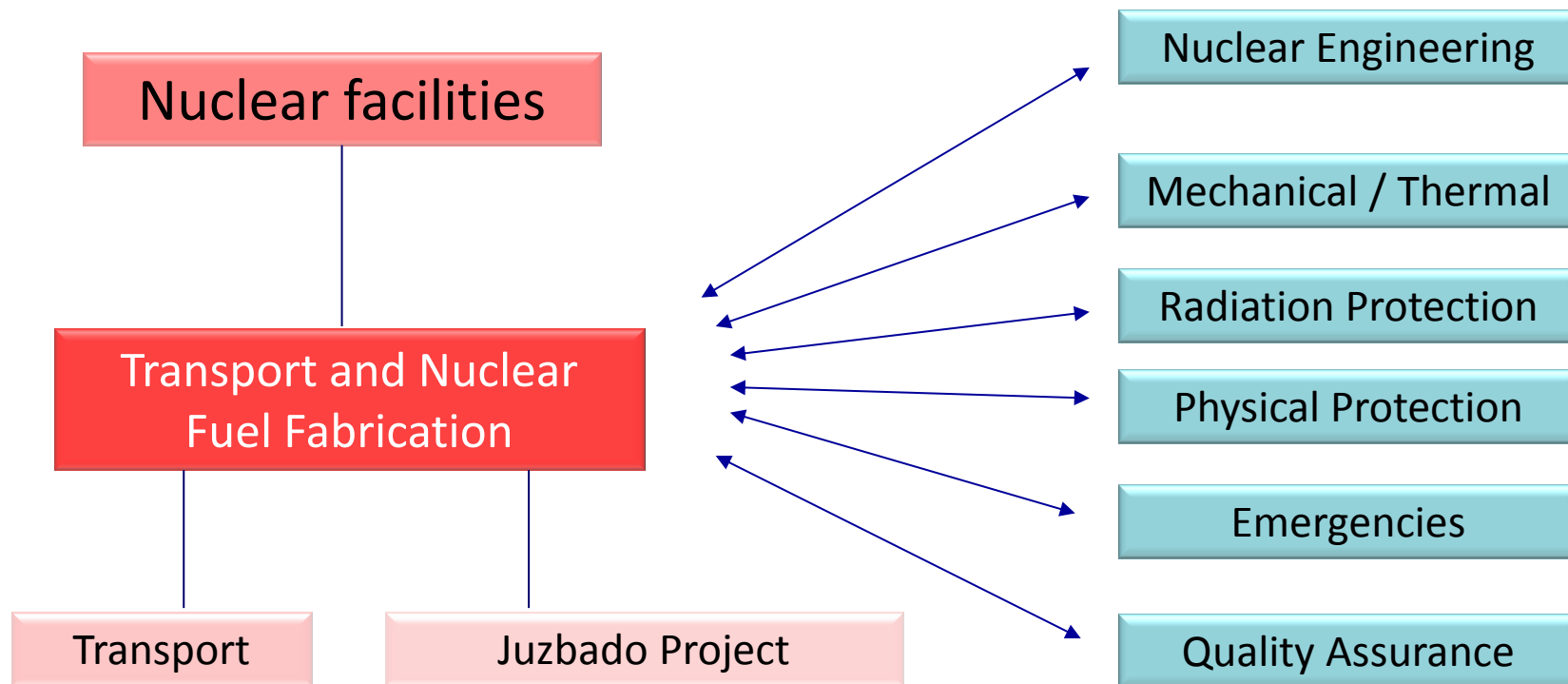
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Nuclear Safety Council (CSN) - Organization



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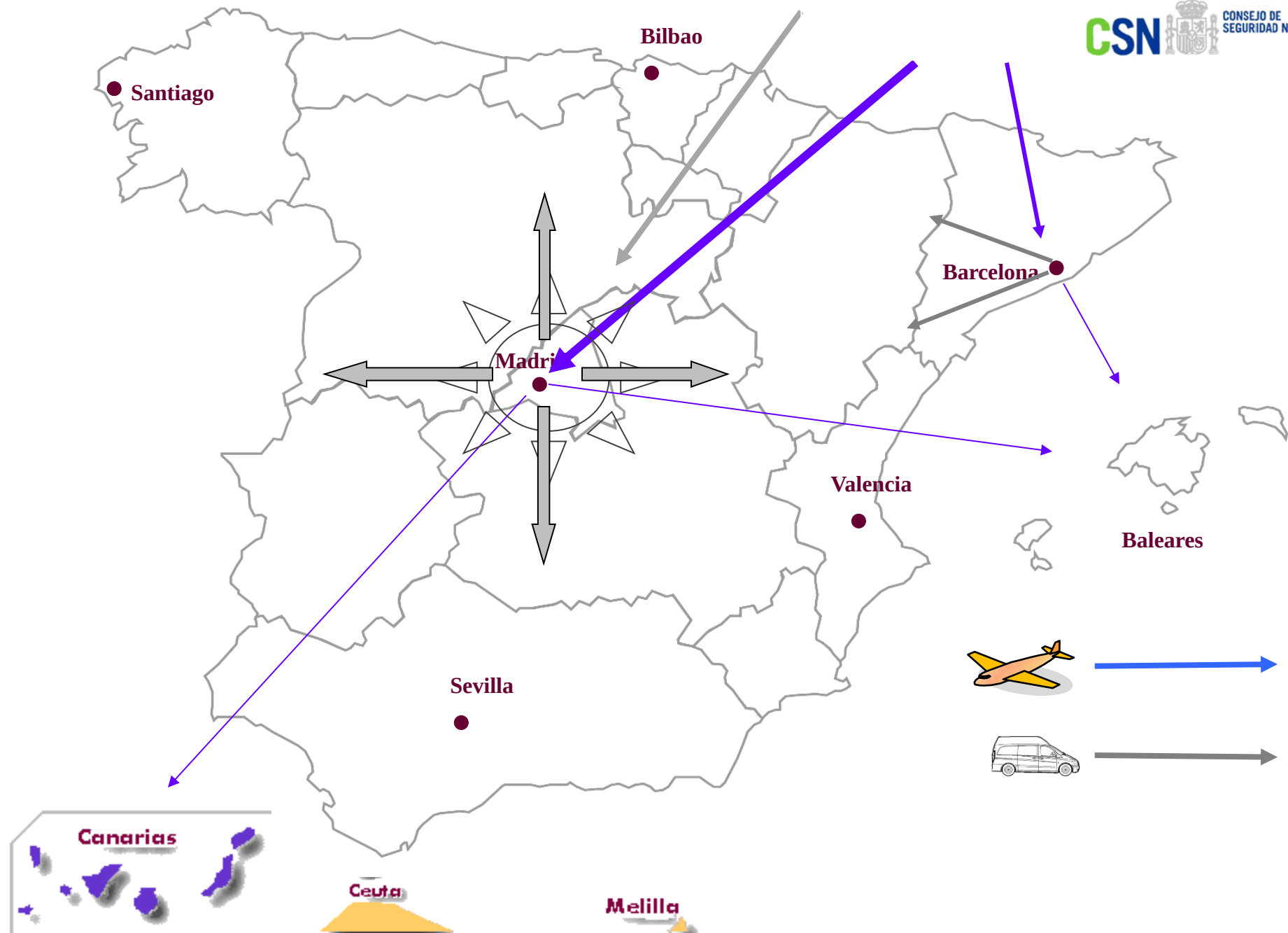
Transport Unit in the CSN



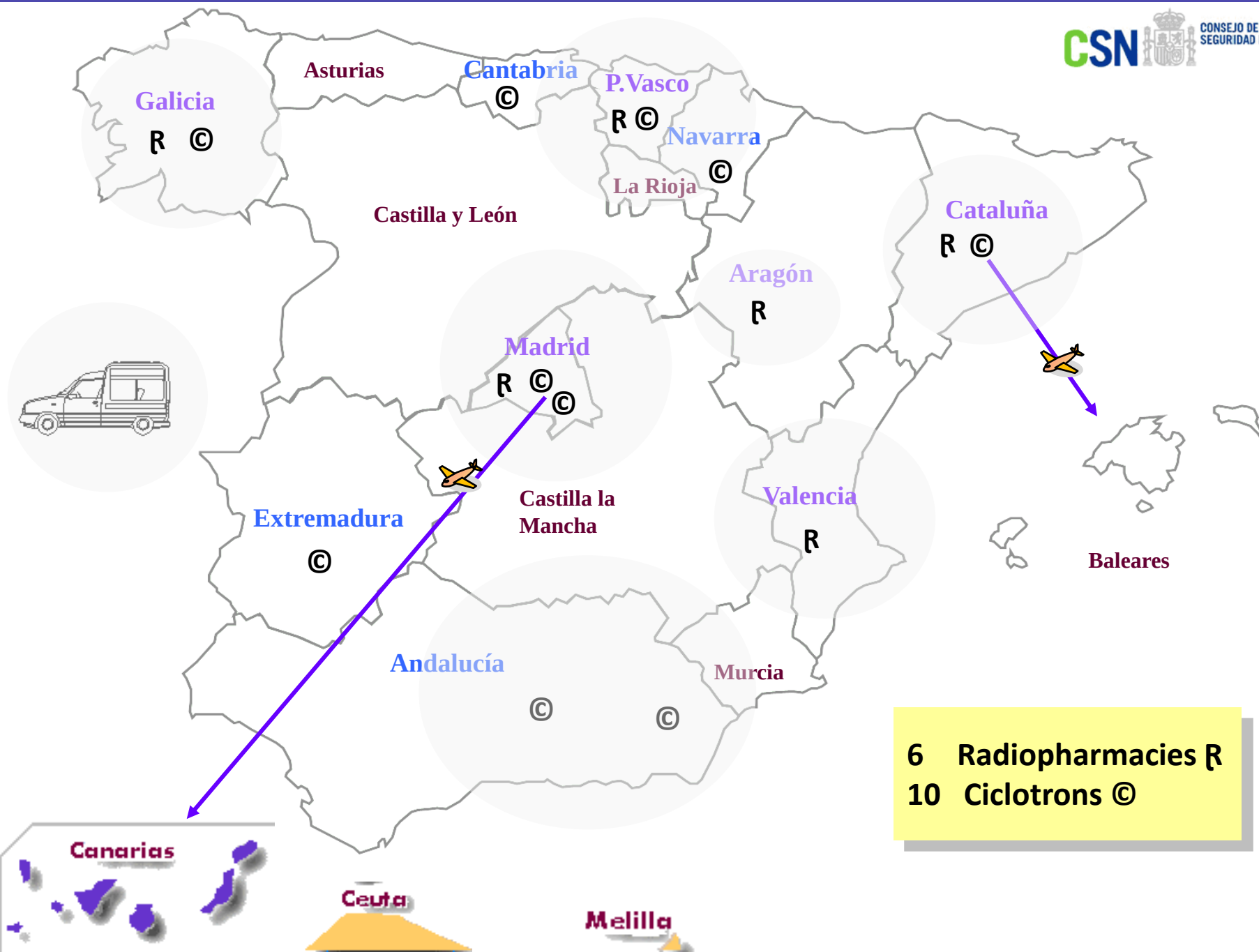
10 | Summary of transports in Spain

Type of Package	Radioactive material use	Consignments /year	Modes of transport
Excepted and Type A	o Medicine , Research, Industry	> 40.000	Air/road
	o Industry (Moisture Gauges)	> 90.000 packages	
Industrial	o Radioactive wastes	Hundreds	Road
	o Contaminated objects	~ 300	Road / Maritime
	o Uranium concentrates	~ 100	Road
Type B	o Industrial gammagraphy	~ 10	Maritime (Transits)
	o Teletherapy and Industrial irradiators	Hundreds	Road
Fissile	o Uranium Oxide	~ 5	Air / Road/Maritime
	o Fresh Fuel Assemblies	~ 70	Road/Maritime

11 Transport of Radiopharmaceuticals



12 Transport from Radiopharmacies and Ciclotrons (F-18)



6 Radiopharmacies R
10 Ciclotrons C

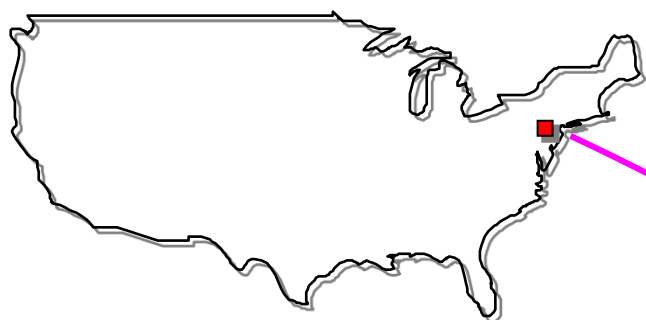
13 Transport in the Nuclear Fuel Cycle: Uranium Concentrates



Maritime transits

14 Transport in the Nuclear Fuel Cycle: Uranium Oxide

100 % imported

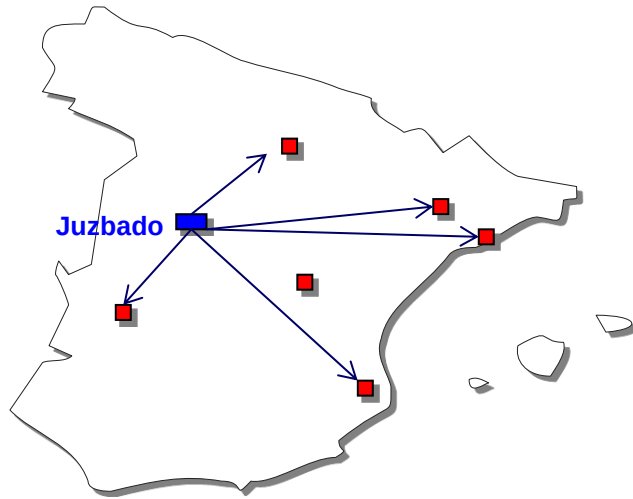


Maritime – road

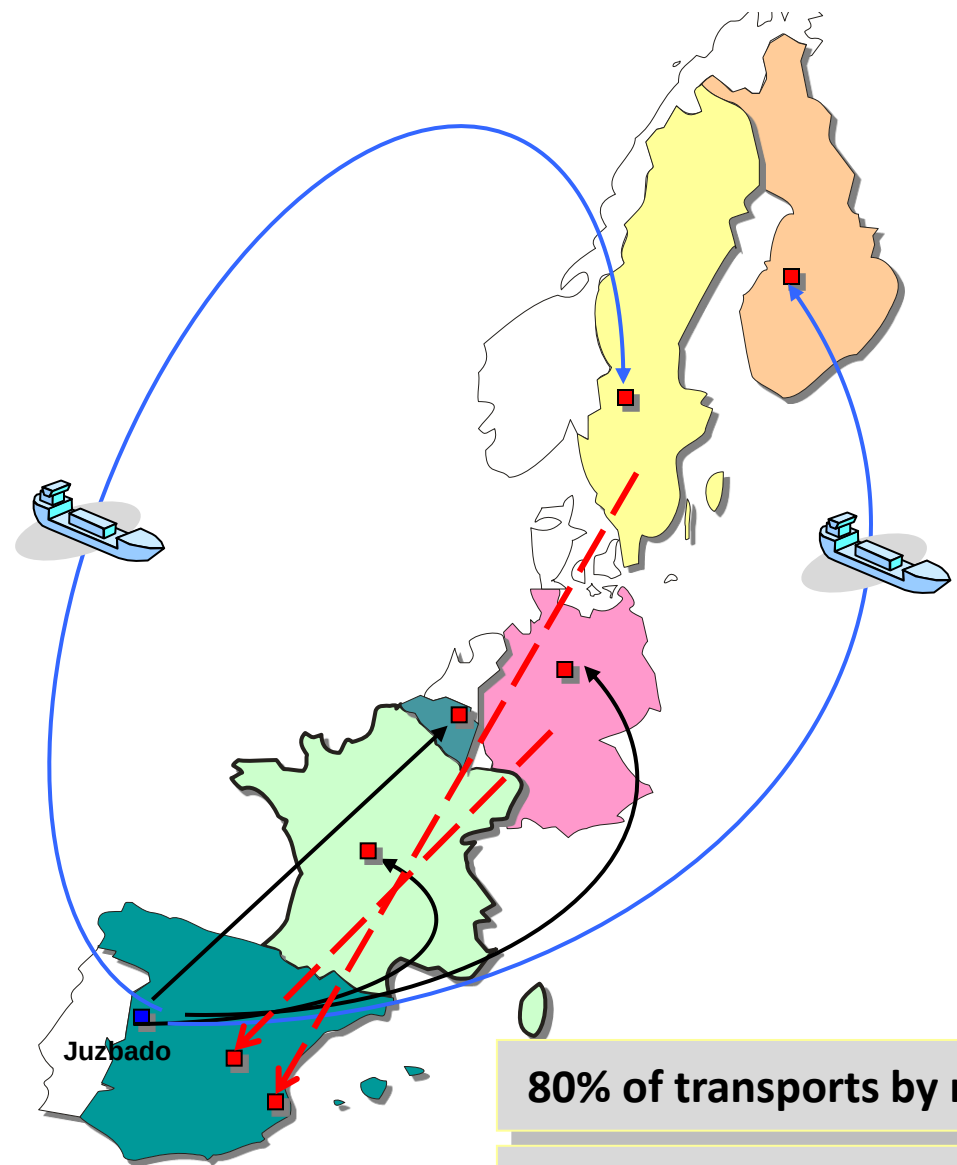
Juzbado



15 Transport in the Nuclear Fuel Cycle: Fresh Fuel Assemblies



~ 30 % of transports
towards Spanish NPP



80% of transports by road

20% Road - maritime

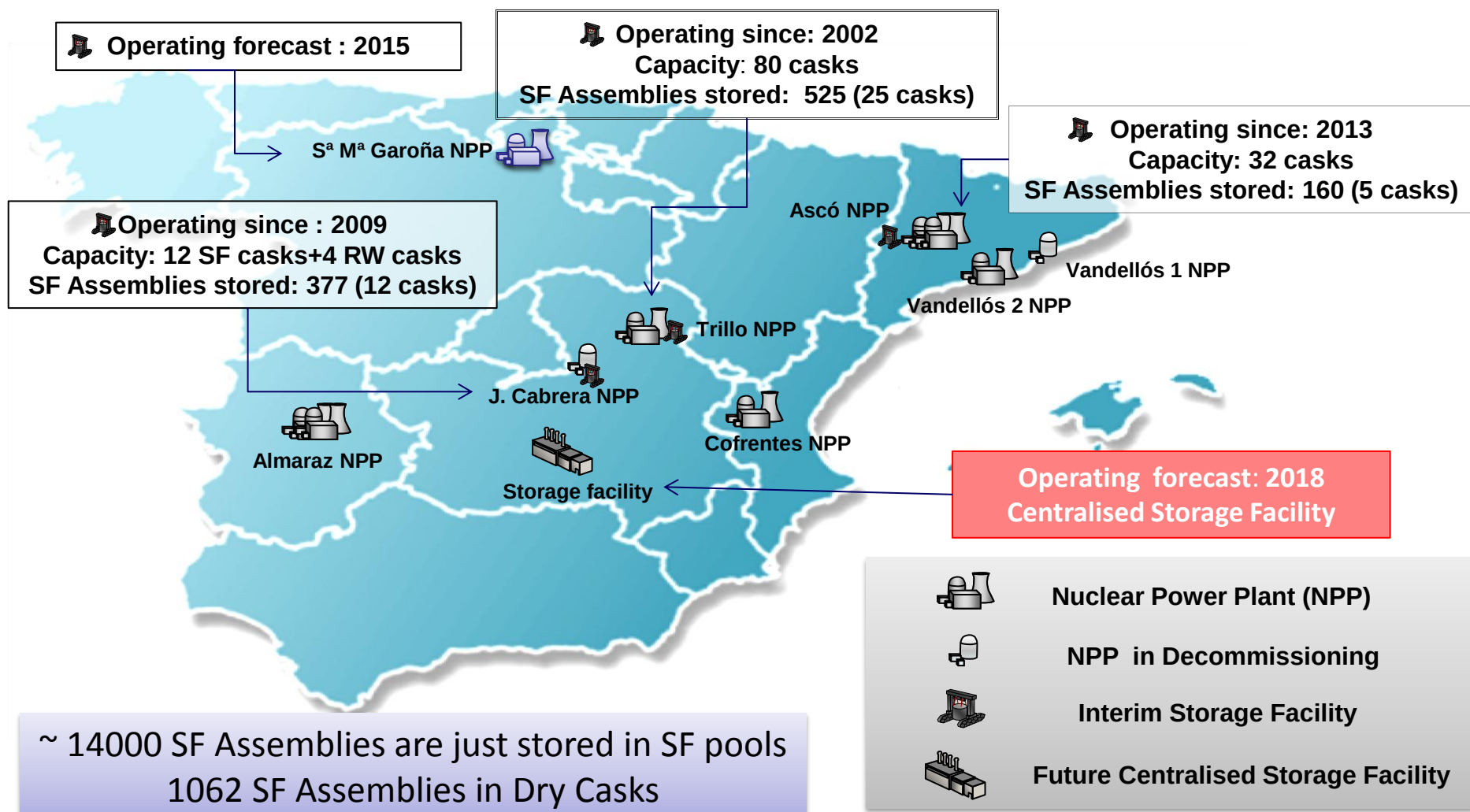
16 Transport in the Nuclear Fuel Cycle: Spent Fuel



At present only sporadic transports of irradiated rods for research projects



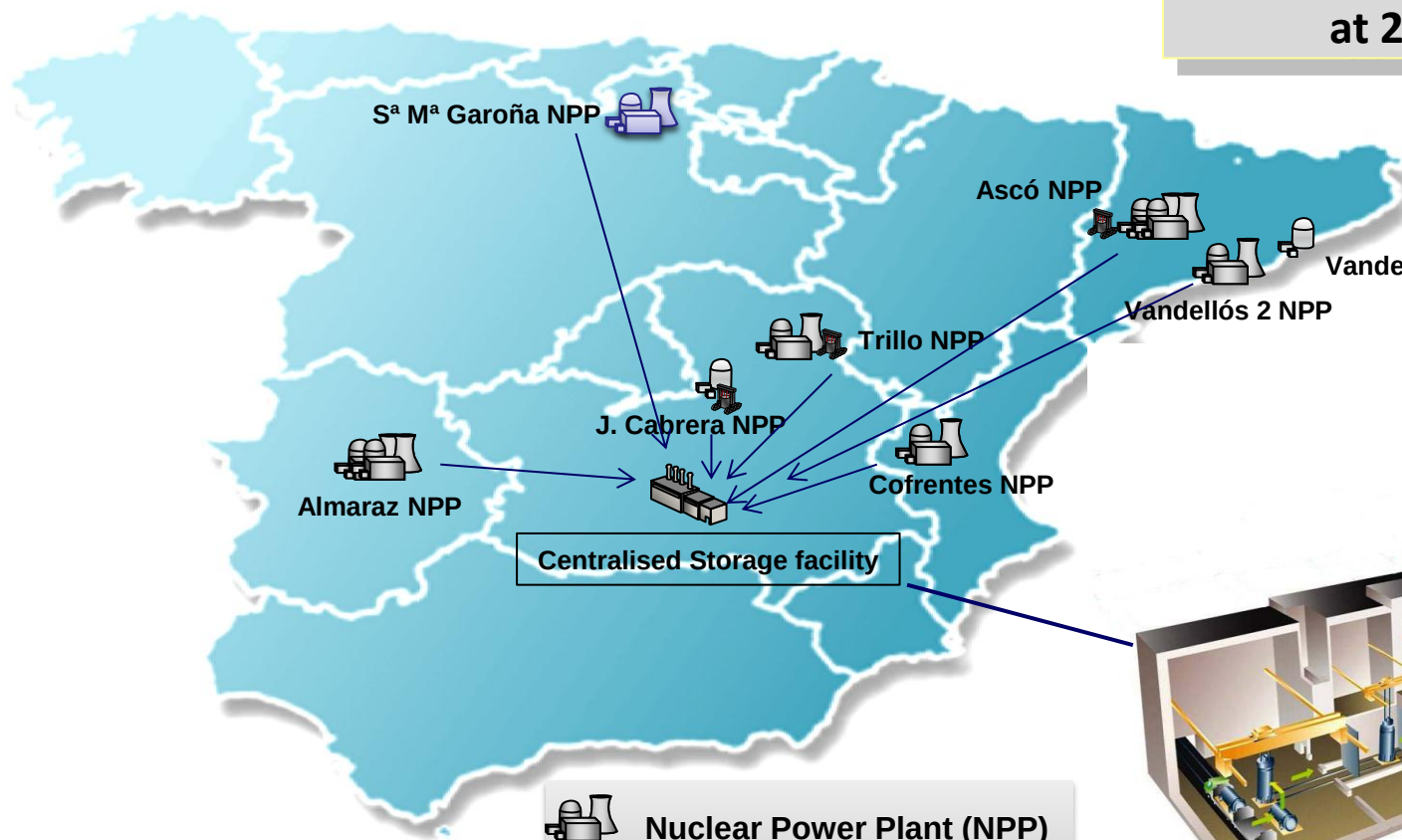
17 | Spent Fuel Management



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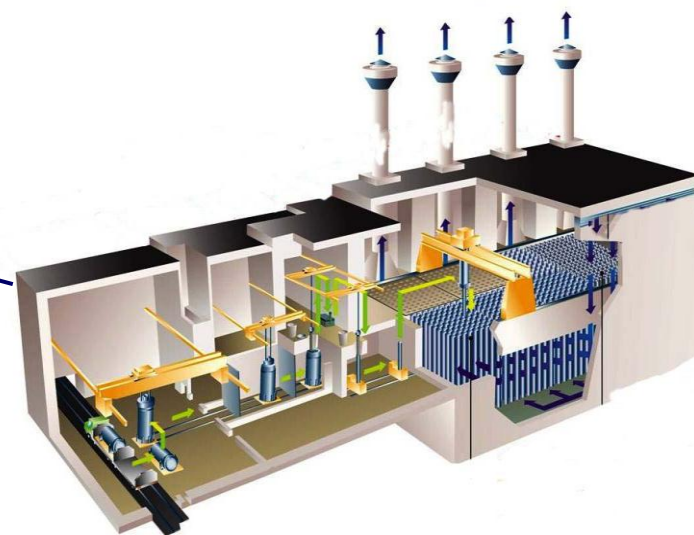
Transport of spent fuel to the centralized storage

Transports of SF would start
at 2018 -2019



Nuclear Power Plant (NPP)

NPP in Decommissioning
Interim Storage Facility



19 | Summary of Transport Licensing and Inspections

- ❑ Packages approvals/validations: About 6 per year (14 designs just approved)
- ❑ Shipment approvals: about 2 per year (special arrangements)
- ❑ Physical protection authorisations: about 3 per year
- ❑ Carriers by road registration: about 2 per year (50 just registered)
- ❑ Inspections:
 - About 80 inspections (specific on transport): to consignors, carriers, consignees and shipments.
 - Compliance checking of transport requirements included in general inspection to radioactive facilities activities (mobile gammagraphy, mobile gauges, suppliers of radioactive material).

20 | Transport Events (1997-2013)

	1997-2007	2008	2009	2010	2011	2012	2013	TOTAL
Packaging deviations	3	3	0	0	0	0	0	6
Inappropriate contents	2	1	1	0	0	0	0	4
Packaging contamination	1	0	0	0	0	0	0	1
Events in airport terminals	30	0	0	0	0	0	1	31
Road accidents	15	3	1	3	1	1	4	28
thefts from vehicles	8	1	1	1	1	0	0	12
Lost packages	3	0	2	1	0	0	0	6
TOTAL	62	8	5	5	2	1	5	88

21 | CSN Regulations on transport

The CSN Safety Instructions (IS) are binding regulations which try to complement the transport regulations

Nº	Subject	Publication date
IS-34	Radiation protection, non compliances, emergency availability	2012 (S/E)
IS-35	Modification of package designs	2014 (S/E)
IS-XX	Control of packaging manufactures	Expected in 2014
IS-XX	Training of workers involved in transport operations	Expected in 2014
IS-XX	Notification of transport events to the CSN	Expected in 2015

S/E: in Spanish and English

22 | CSN Guidance on transport

The CSN Guides are non binding documents which try to help for complying with regulations. The series number '6' is dedicated to transport subjects

Nº	Subject	IAEA Equivalent
6.1	Quality Assurance Programmes in transport	-
6.2	Radiation Protection Programmes	TS-G-1.3
6.3	Emergency Instructions	TS-G-1.2 (partialy)
6.4	Application of package and shipments approvals (S/E)	-
6.5	Assistance for the aplication of transport regulations	TS-G-1.6
6.6	Compliance Documentation for Non Approval packages (in elaboration / publication expected: 2015)	-

S/E: in Spanish and English

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CSN Information / Training / Communication

- ❑ The CSN produces brochures, documents and videos for information of the public and for helping in the training of workers involved in transport of radioactive material. This material is accessible directly from the CSN web site or may be obtained free of charge through the CSN Publication Department.
- ❑ CSN web site: www.csn.es
 - Transport: <http://www.csn.es/index.php/en/transport>
 - Transport of radioactive material
 - Transport: requirements
 - Transport: Standards
 - [Summary of regulatory requirements](#)
 - Clarification of regulatory requirements
 - [List of transport packages approved in Spain](#)
 - Denials and Delays on transport of radioactive material
 - Other matters of interest

24 | Present and short terms challenges

- ☐ Reduce doses of radiopharmaceutical carriers
- ☐ Reduce events in radiopharmaceutical transports
- ☐ Improve the training of workers involved in transport activities
- ☐ Improve the control on the fabrication of packages
- ☐ Licensing of new package designs for Spent Fuel
- ☐ Future shipments of Spent Fuel towards the Centralised Storage Facility



Thank you

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