

Digital Radiological Passbook application experience

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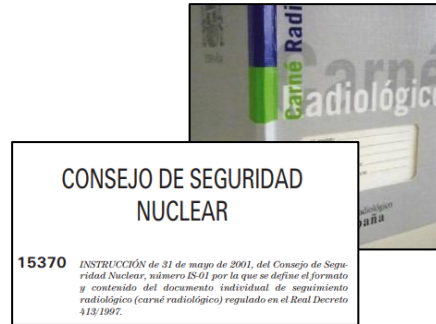
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Regulatory Framework

RD 413/1997
Art. 7: Individual
document for radiological
monitoring.



EU Directive
2013/59/EURATOM
Annex X: Data system for
individual radiological
monitoring



**Digital
Radiological
passbook App**

1997

2001

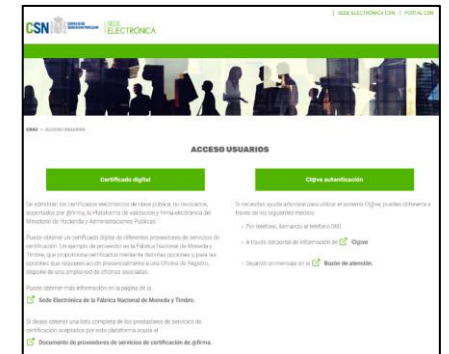
2013

2022

2024

IS-01 del CSN:
Defines format and
content of the individual
radiological monitoring
Radiological Passbook.

RD 1029/2022
Art. 58: Radiological
Passbook



|| Concept

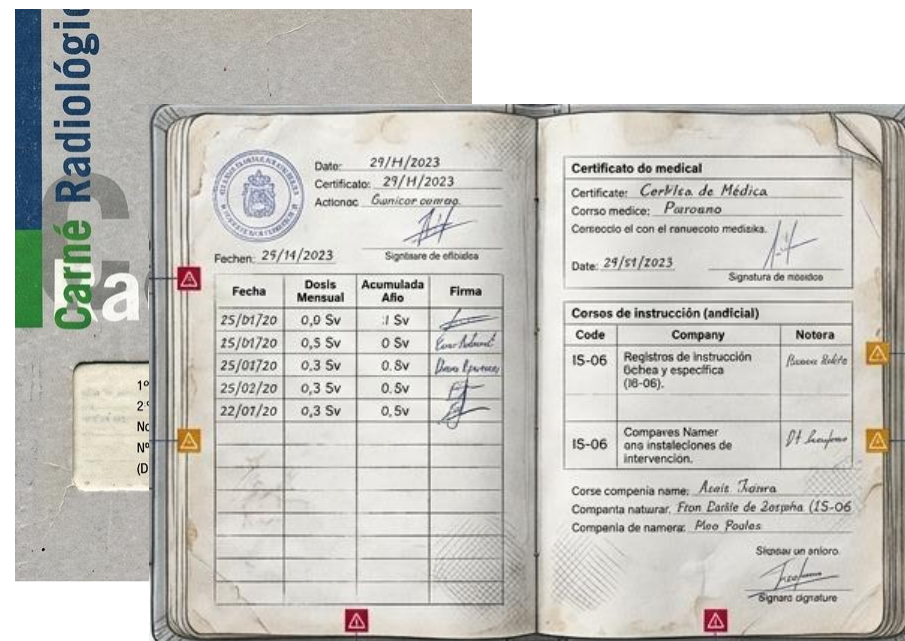
Past State

Document Management

Format in paper notebook that requires physical custody and presents a high risk of deterioration or loss

Manual Registration

Manual transcription of dosimetry and training data, which increases the risk of human error



Analog Validation

Dependence on physical signatures and ink stamps to verify the authenticity of each record, slowing down operations

Rigid Expiration

Static and inflexible 3-year validity, regardless of the actual status of medical or training requirements

Logistical Bottleneck

Emission dependent on postal mail shipments, generating downtime and operational delays for companies and workers. Huge costs for CSN.

|| Concept

Digital Radiological Passbook

- Nature:
 - Centralized data easy to access
 - Secure Platform → web application hosted in CSN electronic office
 - Data input verified by digital ID certificate
- Characteristics:
 - Direct connection to the National Dose Registry
 - Dynamic validity → no renewal required
 - Automatic validations → e.g. preventing a worker from being registered at two facilities simultaneously
 - Traceability and good quality of data



|| Advantages

External Worker

- Full historic data always available
- Fast registration and company switching
- Impossible to lose information



External Company

- Immediate external worker registration and new hires
- Removal of custody obligation and renewal process
- Improvement in data record quality



Facility

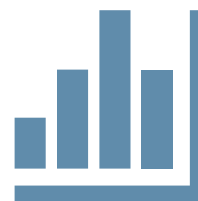
- Fast and convenient integration into the workforce and release of external workers
- Elimination of the need to verify compliance with passbook records and custody
- Mistake reduction in records



III Processes



Registration and
deregistration of an
external worker in a
external company



Registration and
deregistration of an
external worker in a facility

Data fields to be
completed by external
companies



Data fields to be
completed by facilities

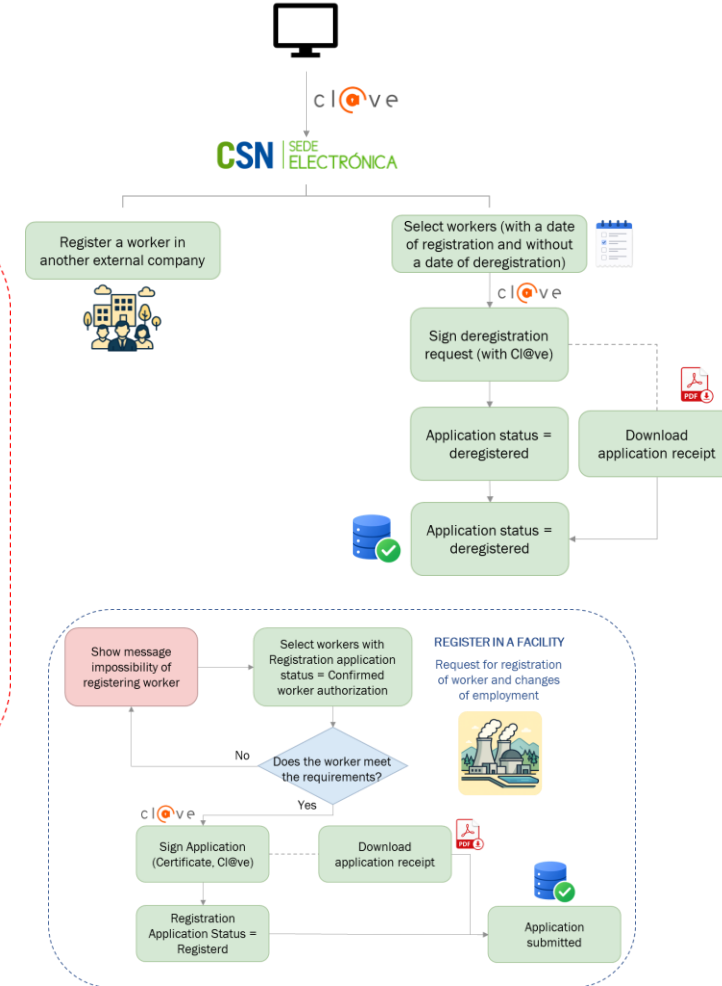
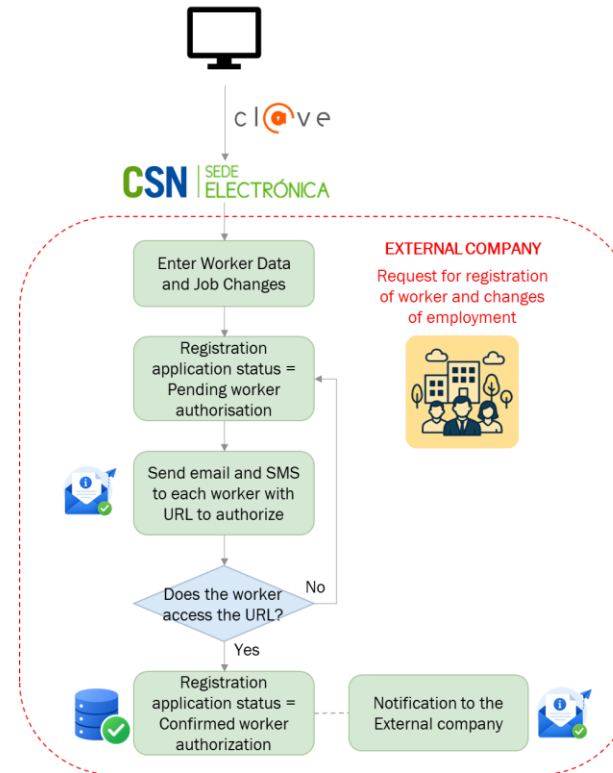


Processes



Registration and deregistration of an external worker in a external company

- Two possibilities: New registration as exposed workers or company change.
- Confirmation from the worker via a code sent by SMS or email.
- The registration request is digitally signed by a representative of the company and kept in record.
- Existing dose data for that worker is automatically completed by the link between CRAD and National Dose Database

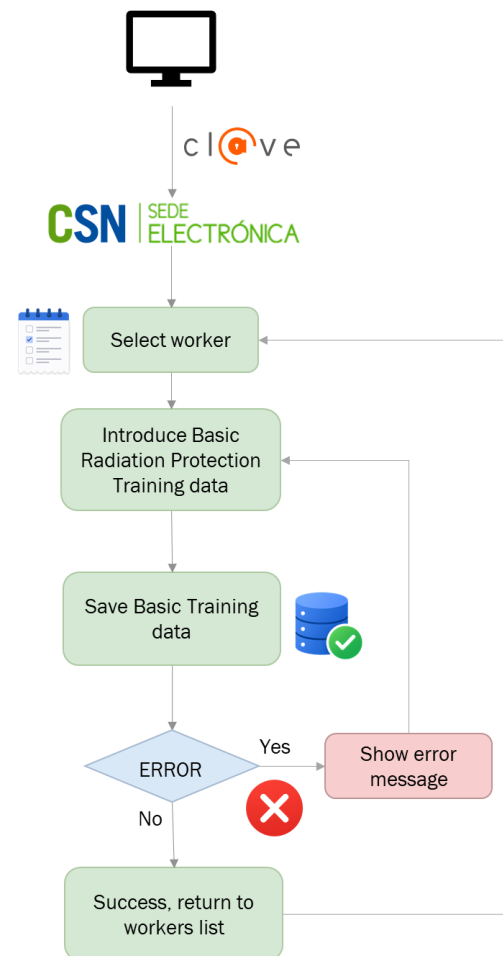


Processes

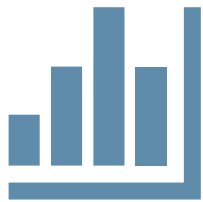


Data fields to be
completed by external
companies

- Personal information and radiological classification of the worker
- Radiological Protection Basic training (regulated by Safety Instruction IS-06)
- Medical fitness for radiation exposures

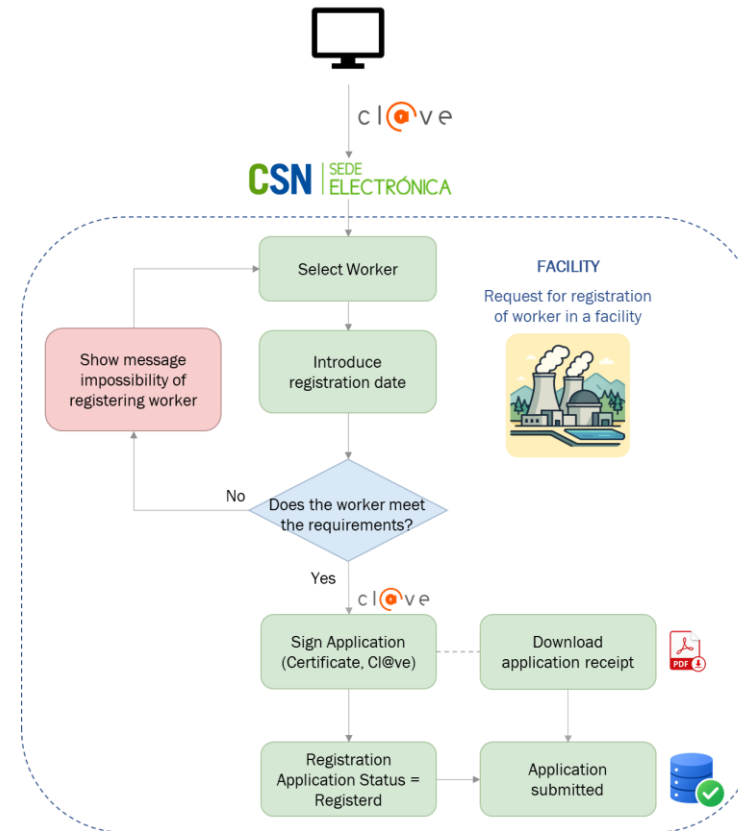


Processes



Registration and deregistration of an external worker in a facility

- Two possibilities: New registration as exposed workers or company change.
- Confirmation from the worker via a code sent by SMS or email.
- The registration request is digitally signed by a representative of the company and kept in record.

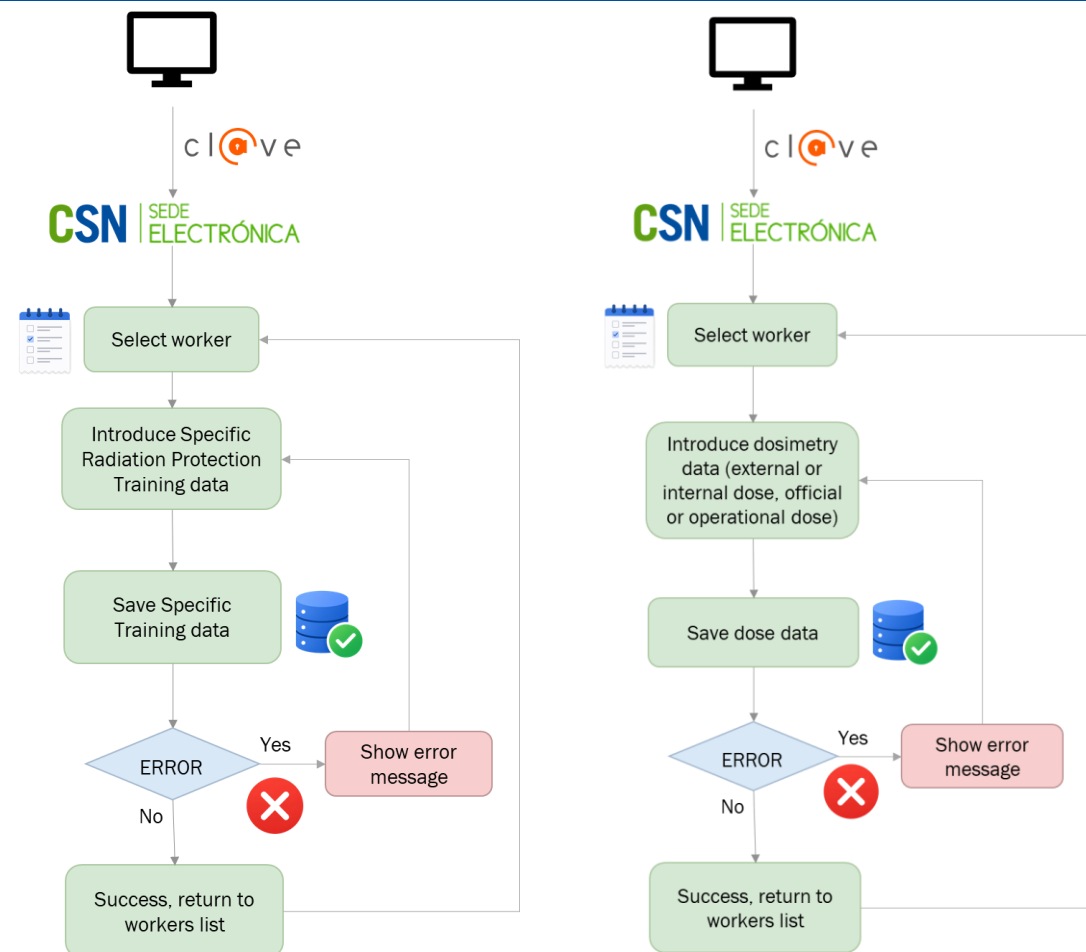


Processes



Data fields to be completed by facilities

- Specific Radiation Protection Training (regulated by Safety Instruction IS-06)
- Initial internal dosimetry control
- Operational dosimetry data
- Final internal dosimetry control



Processes

DETALLE CARNÉ RADIOLÓGICO

DATOS DEL CARNÉ RADIOLÓGICO

Número de Carné Radiológico

123456

Fecha de emisión

12/02/2000

DESCARGAR CARNÉ



DATOS DEL TRABAJADOR

DNI/NIE

82551900R

Nombre

Nombre

Primer apellido

Apellido 1

Segundo apellido

Apellido 2

Teléfono

658899800

Correo electrónico

correo@prueba.es

- 1.- HISTORIAL DOSIMÉTRICO
- 2.- HISTORIAL DE ALTAS/BAJAS EN EMPRESAS EXTERNAS
- 3.- HISTORIAL DE ALTAS/BAJAS EN CENTRALES NUCLEARES
- 4.- HISTORIAL DE RECONOCIMIENTOS MÉDICOS
- 5.- HISTORIAL DE FORMACIÓN EN PROTECCIÓN RADIOLÓGICA
- 6.- INFORMACIÓN DOSIMÉTRICA

1.- HISTORIAL DOSIMÉTRICO

DOSIS VIDA (mSv)

EXPOSICIÓN EXTERNA								CONTAMINACIÓN INTERNA	DOSIS EFECTIVA [Suma de (1) y (2)]
(1) Dosis profunda	Dosis superficial	Dosis por exposición no uniforme						(2) Dosis efectiva comprometida E (1)	
		Manos	Antebrazo	Pies	Tobillos	Cristalino	Otras zonas		
23	11	0,1	1	2	0,7	2	0,7	2	0,7

DOSIS EFECTIVA DE LOS ÚLTIMOS 5 AÑOS (mSv) *(sin contar año en curso)*

Año	Exposición externa (1)	Contaminación interna (2)	Dosis efectiva [Suma de (1) y (2)]	Observaciones (*)
2017	1	0,2	1,2	Mis observaciones
2018	2	0,2	2,2	Mis observaciones1
2019	3	1	4	Otras observaciones
2020	1,1	0,2	1,3	Mis observaciones2
2021	3,1	1	4,1	Otras observaciones1

(*) Reflejar aspectos relevantes en relación con las dosis recibidas por el trabajador, como por ejemplo, dosis resultantes de exposiciones especialmente autorizadas.

III
Processes

3.- HISTORIAL DE ALTAS/BAJAS EN CENTRALES NUCLEARES

INFORMACIÓN RELATIVA A INSTALACIONES NUCLEARES O RADIATIVAS EN LAS QUE HA PRESTADO O PRESTA SERVICIO EL TRABAJADOR

Instalación	Dirección	Fecha alta	Fecha baja	Titular de la instalación / Persona delegada
Central Nuclear Almaraz I	Almaraz (Cáceres)	12/03/2017	12/03/2018	
Central Nuclear Trillo	19450 Trillo, Guadalajara	22/04/2018	12/03/2019	
Central Nuclear de Cofrentes	46625 Cofrentes, Valencia	22/04/2019		

4.- HISTORIAL DE RECONOCIMIENTOS MÉDICOS

Fecha	Clase reconocimiento	Resultado	Contaminación externa	Contaminación interna	Numero colegiado	Acciones
02/04/2024	RP	No apto	122	112		✎ 🚫
Reconocimiento de alta (RA)		Reconocimiento periódico (RP)	Reconocimiento especial (RES)			

Añadir reconocimiento

5.- HISTORIAL DE FORMACIÓN EN PROTECCIÓN RADIOLÓGICA

FORMACIÓN BÁSICA

Fecha	Centro / Empresa de instrucción	Responsable de la entidad / Persona responsable del curso	Observaciones	Acciones
12/09/2019	Centro 1			
14/12/2020	Centro 1			✎ 🚫
23/05/2021	Centro 2		Observacion 1	✎ 🚫

Añadir formación

6.- INFORMACIÓN DOSIMÉTRICA

DOSIS POR CONTAMINACIÓN INTERNA (mSv)

Fecha de asignación mes/año	Fecha de medida día/mes/año	Tipo de control (*)	Ai total (Bq)	Isótopos	Dosis efectiva comprometida E (t)	Observaciones (**)
09/2019	23/09/2019	Alta	5	P-32	2	
12/2020	23/12/2020	Baja	5	I-131	3	

(*) Alta; baja, periódico (anual, semestral...); especial

(**) Reflejar aspectos relevantes en relación con las dosis recibidas por el trabajador, como por ejemplo, dosis resultantes de exposiciones especialmente autorizadas

FICHA DOSIMÉTRICA

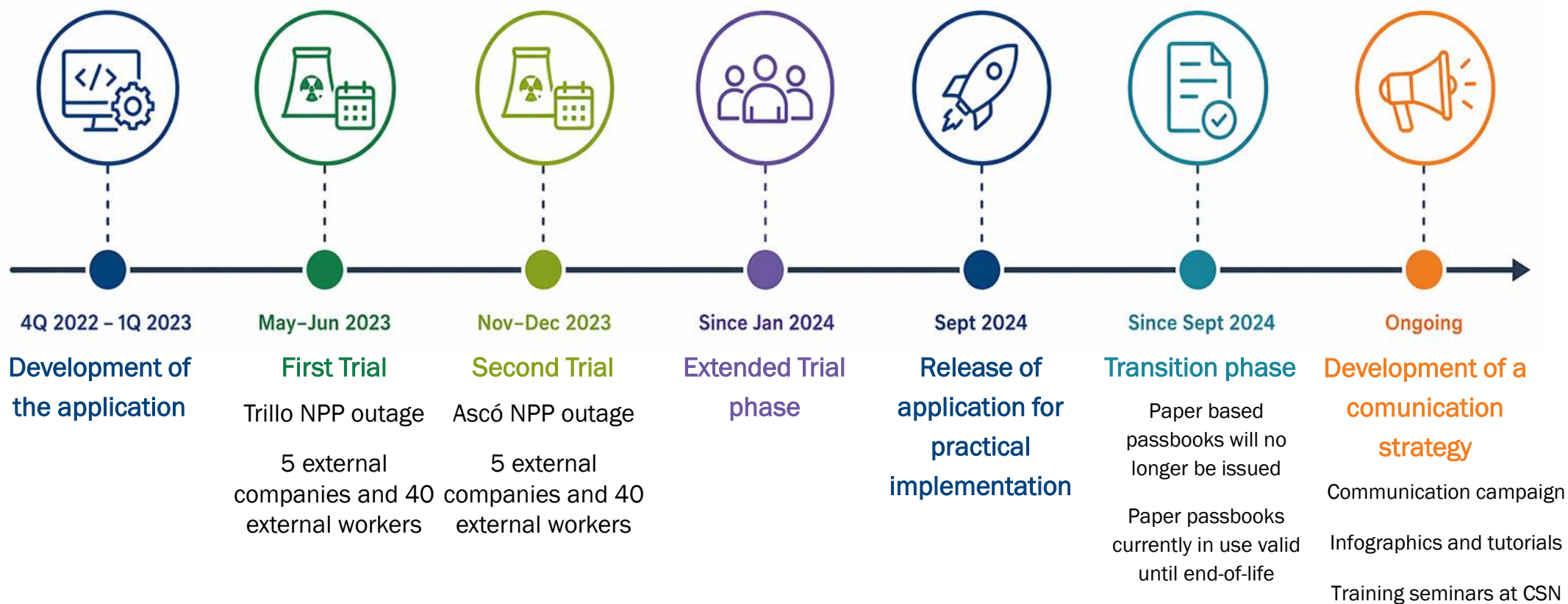
DOSIS POR IRRADIACIÓN EXTERNA, DOSIMETRÍA OPERACIONAL (mSv) (*)

Año	Mes/Período	Dosis registrada	Observaciones
2017	05/03-17	0,2	Mis observaciones
2018	10/01-31	0,2	Mis observaciones1

(*) El período de validez de la dosimetría operacional será de 90 días

IV Development and implementation

Radiological Passbook Application – Key Milestones



IV Development and implementation

Digitalization process: Evolution in 2025 and 2026

- Past renovation process around January
 - Differences between 2025 and 2026 values
- Increased Passbook Registrations before the first outages of the year (Feb-25/Mar-25)

Passbooks created

9764

Digital transition percentage

93.0%

Passbook Registrations and Cumulative Passbooks



Digital transition is practically completed!

IV Development and implementation



Tailored data analysis for any facility or external company

Data-driven decision-making powered by BI tools

Monitoring of individual, collective and maximum doses across workers, facilities and companies

Real-time supervision of workers capacity

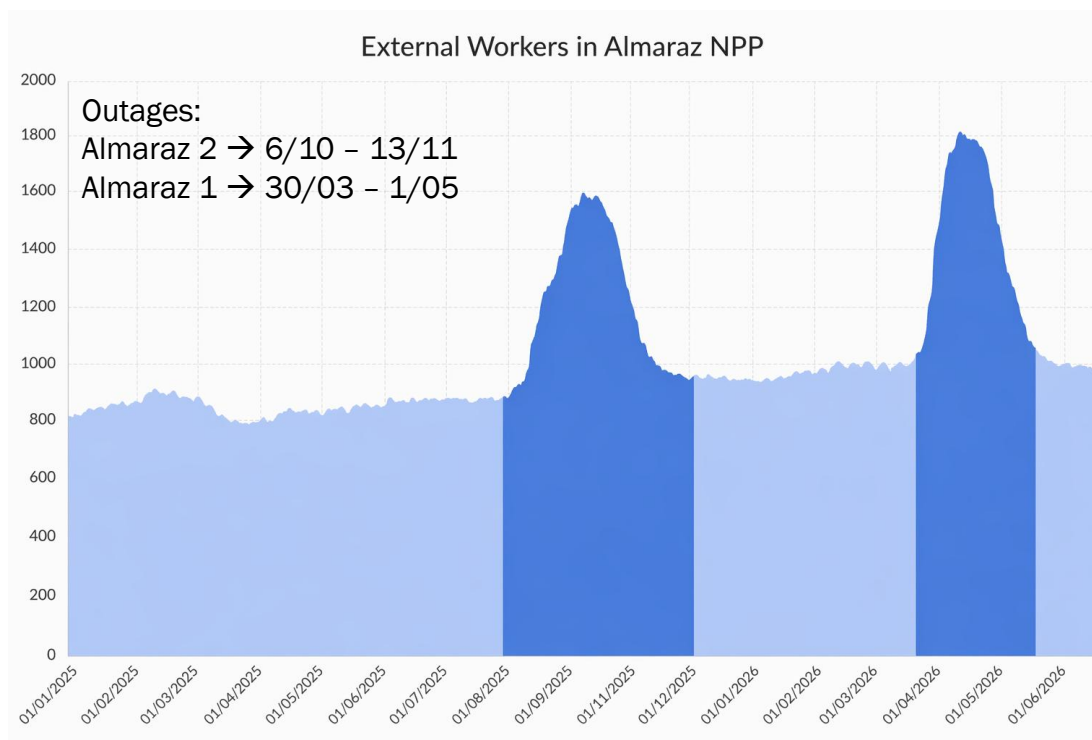
Faster and more efficient inspections



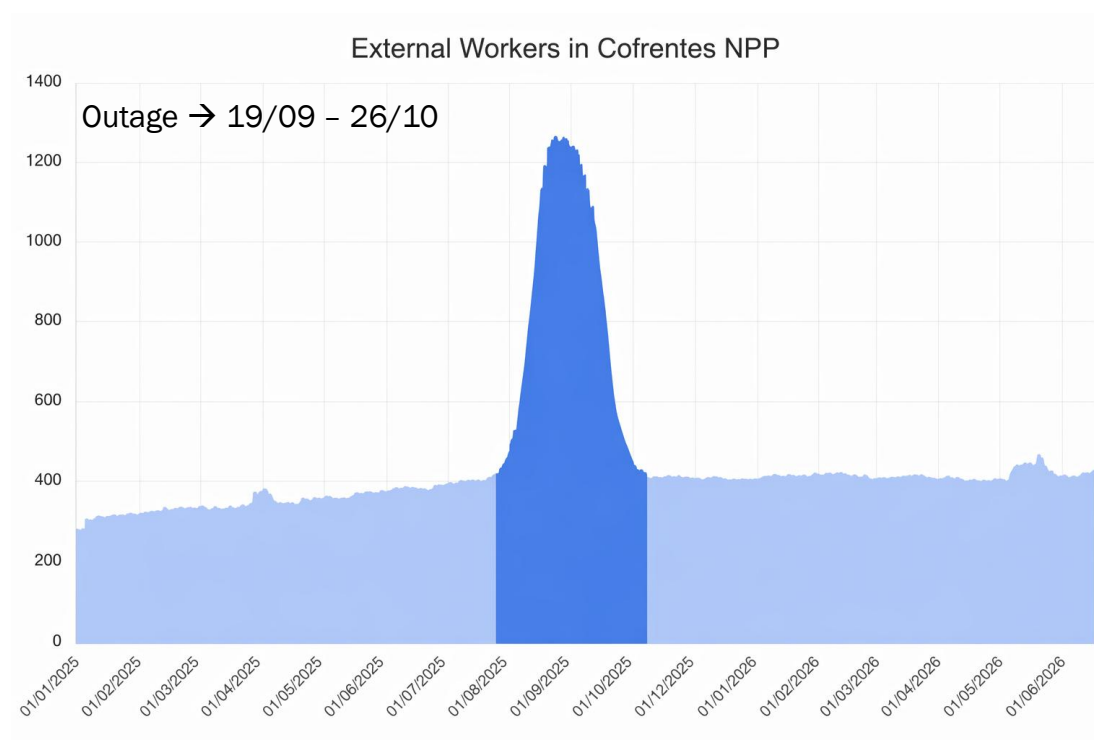
IV Development and implementation

Data analysis: Focus on specific Nuclear Power Plants

Almaraz

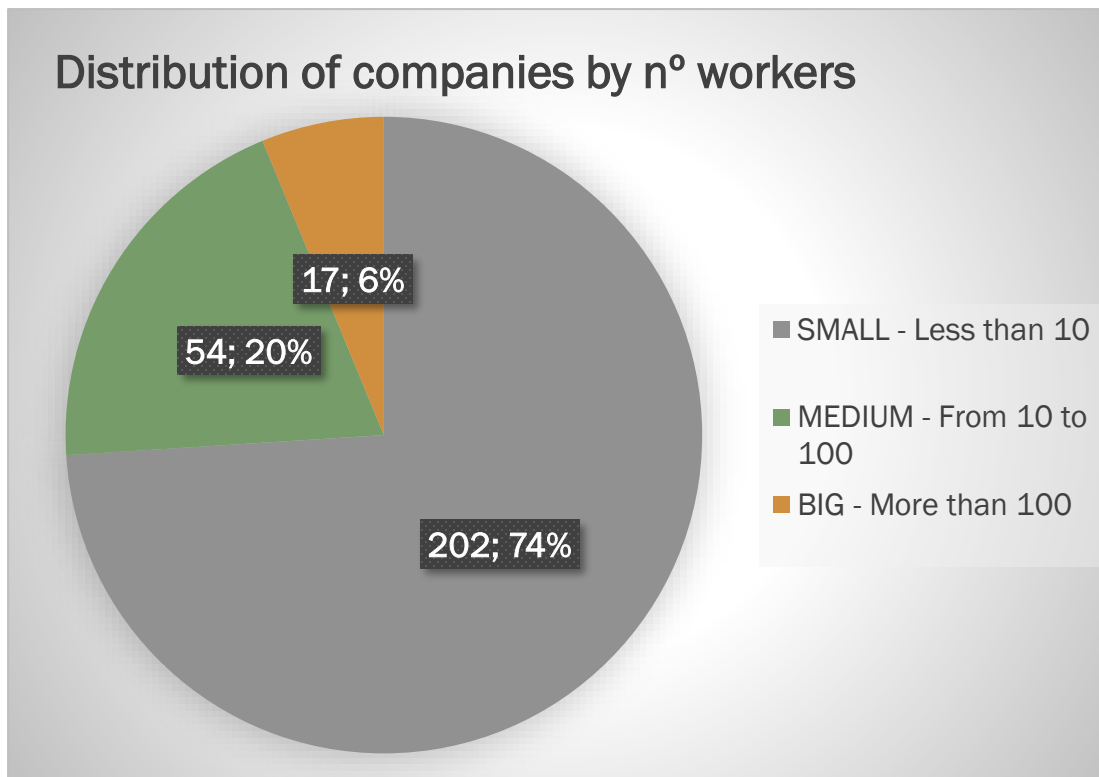


Cofrentes



IV Development and implementation

Data analysis: External Companies



Companies with active passbooks

273

Active passbooks

6005

- Demographic studio can be performed in the nuclear sector:
 - Active companies working in 2026 → Drastically reduced comparing with External Companies Register
- Huge number of SMALL companies:
 - Despite that → 65% of workforce in the BIG companies against 10% of workforce in the SMALL companies
- Which company needs more supervision?
 - Dose criteria, number of workers, continuous presence in NPP, etc.

V Conclusions

- ✓ High reduction on economic costs
- ✓ More sustainable and easier to access the information
- ✓ Enhanced reliability and traceability data
- ✓ Digital transition almost completed
- ✓ Powerful tool to perform Risk Informed Regulation



Paljon kiitoksia
Thank you very much
Muchas gracias

