



EDF Nuclear plant under
decommissioning programme

CIDEN organization

Projects achievement



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- **EDF Nuclear plant under decommissioning programme**
- CIDEN Organization

EDF Nuclear plants in France

In operation : 58 PWR nuclear plants



34 PWR 900 MW

20 PWR 1300 MW

4 PWR 1450 MW

On 19 sites

PWR : Pressurized water Reactor

EDF nuclear plants under decommissioning

➤ 9 reactors under decommissioning

1 Pressurized water reactor (PWR)

Chooz A (300MW) : 1967-1991

1 Heavy water reactor

Brennilis (70 MW) : 1967-1985 (EDF/CEG)

6 Gas graphite reactors (UNGG)

Chinon A1 (70MW) : 1963-1973

Chinon A2 (200MW) : 1965-1985

Chinon A3 (480MW) : 1966-1990

Saint-Laurent A1 (480MW) : 1969-1990

Saint-Laurent A2 (515MW) : 1971-1992

Bugey 1 (540MW) : 1972-1994

1 Fast Breeder reactor

Creys-Malville (1240MW) : 1986-1997

➤ Graphite sleeves silos at St Laurent A



Decommissioning strategy (1)

- ❑ To perform total decommissioning of 9 reactors within 25 years in tow waves
 - ✓ 8 reactors so called “first generation reactors”
 - ✓ Creys-Malville
- ❑ First wave of decommissioning gathering :
 - ✓ Brennilis,
 - ✓ Creys-Malville,
 - ✓ Chooz A,
 - ✓ Bugey 1,
- ❑ Second wave of decommissioning with
 - ✓ the last 5 GGR (Chinon A1, A2 et A3, Saint-Laurent A1 et A2).
 - ✓ And graphite sleeves retrieval from St Laurent silos.



Decommissioning strategy (2)

Decommissioning chronology is based on the following considerations :

- ❑ For Brennilis, EDF and CEA undertook to do decommissioning by the horizon 2015 therefore Brennilis must be inside the first wave,

- ❑ Creys.Malville belong to the first wave for the same reason with a decommissioning schedule over 25 years,

- ❑ Chooz A, is the only PWR reactor and belongs to the first wave as regard to the strategic impact of PWR decommissioning feed back,

GGR - Decommissioning strategy (3)

- ❑ Gaz Graphite Reactors have technical and waste generic aspects :
 - Regarding graphite retrieval and treatment.



- Bugey SG integrated technology, assuming that decommissioning difficulties will cover all GGR decommissioning issues,
- The good progress of level 2 working phases allowing to prepared easily the level 3 working phases,

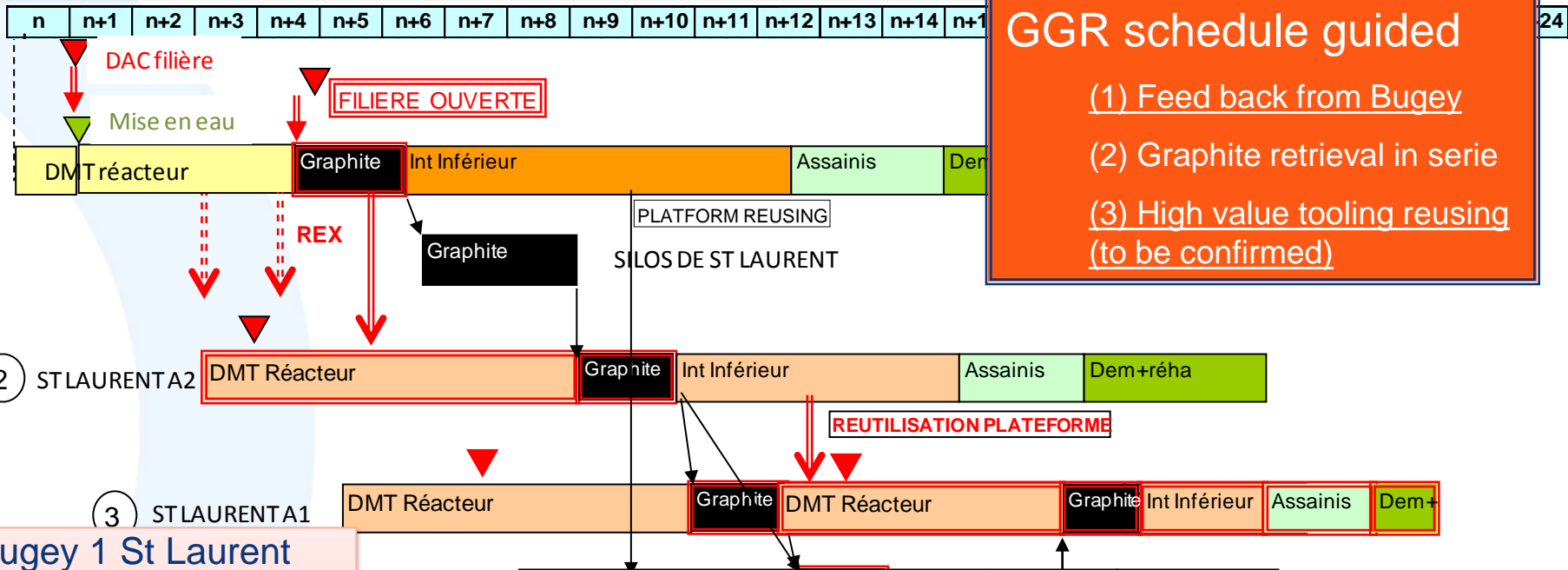


GGR – Decommissioning strategy

- GGR under water decommissioning with Bugey first in line for St Laurent A1 and A2, Chinon A3
- GGR on air decommissioning with Chinon A2 first in line for Chinon A1
 - Strategic port folio issued 2004 and revised 2009
- Five “rules” have been guiding the GGR strategy
 - EDF attitude since 2004
 - Strategic port folio include an internal structure resistance justification
- Graphite retrieval « not after the year 2022 horizon »
 - Writing from French safety authority dated April 2010
- Graphite retrieval in serie to avoid the futur disposal center saturation

GGR – Decommissioning strategy

- GGR decommissioning strategy is global – reactors decommissionings are interconnected and linked to graphite waste route



GGR schedule guided

- (1) Feed back from Bugey
- (2) Graphite retrieval in serie
- (3) High value tooling reusing (to be confirmed)

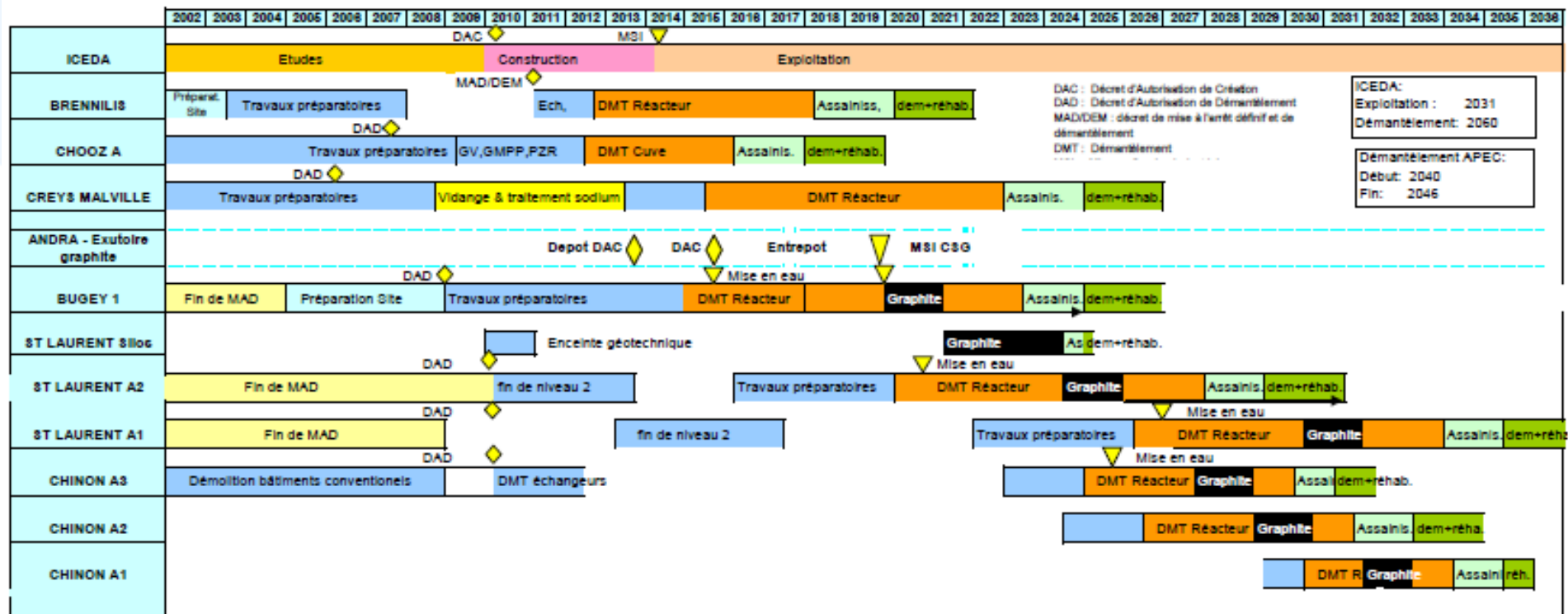
- Bugey 1 St Laurent A1 St Laurent A2 and Chinon A3 decommissioned under water

- Chinon A2 and Chinon A1 decommissioned on air

St Laurent A1 St Laurent A2 and Chinon A3 decommissioned under water
 and Chinon A1 decommissioned on air



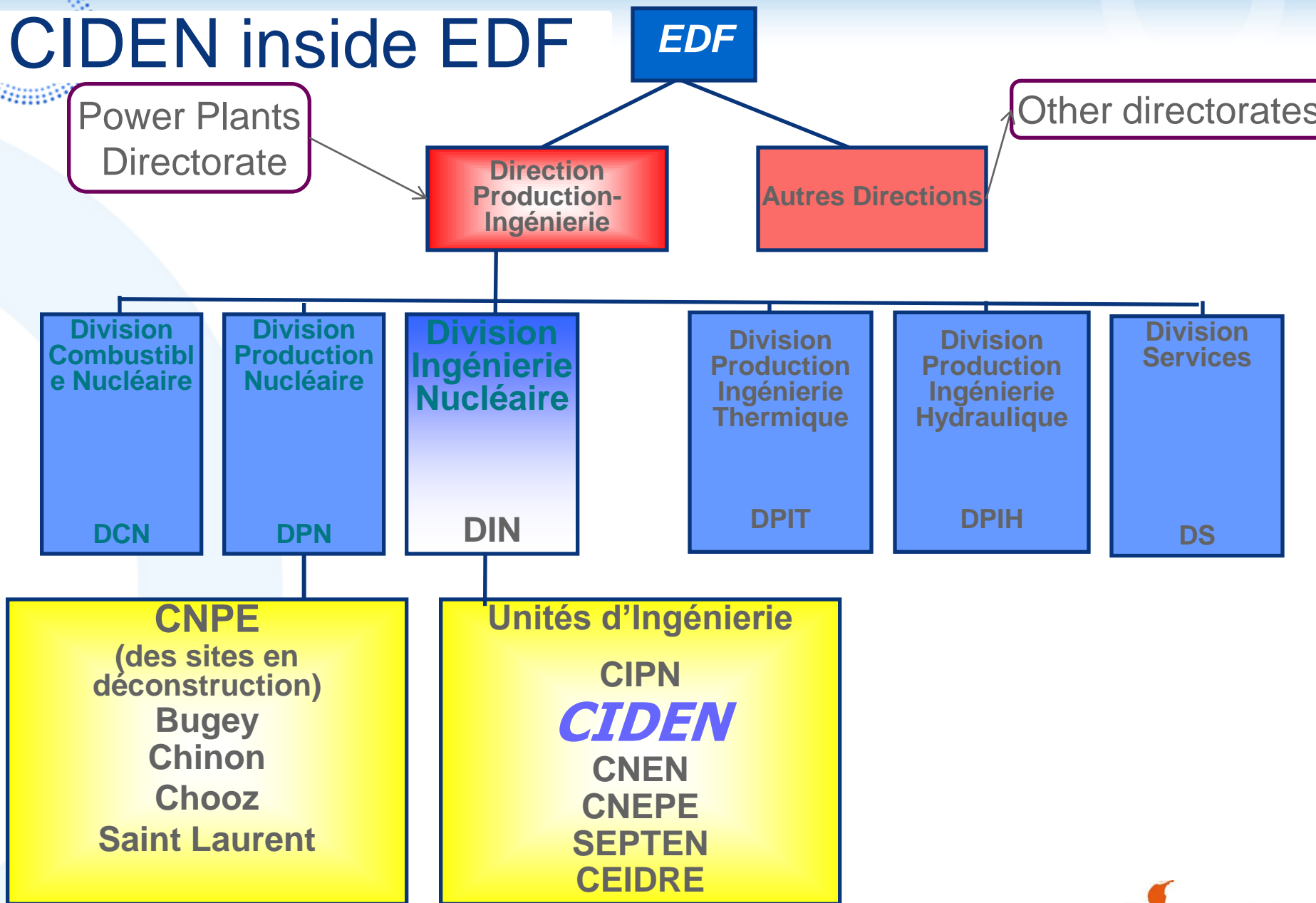
Decommissioning programme



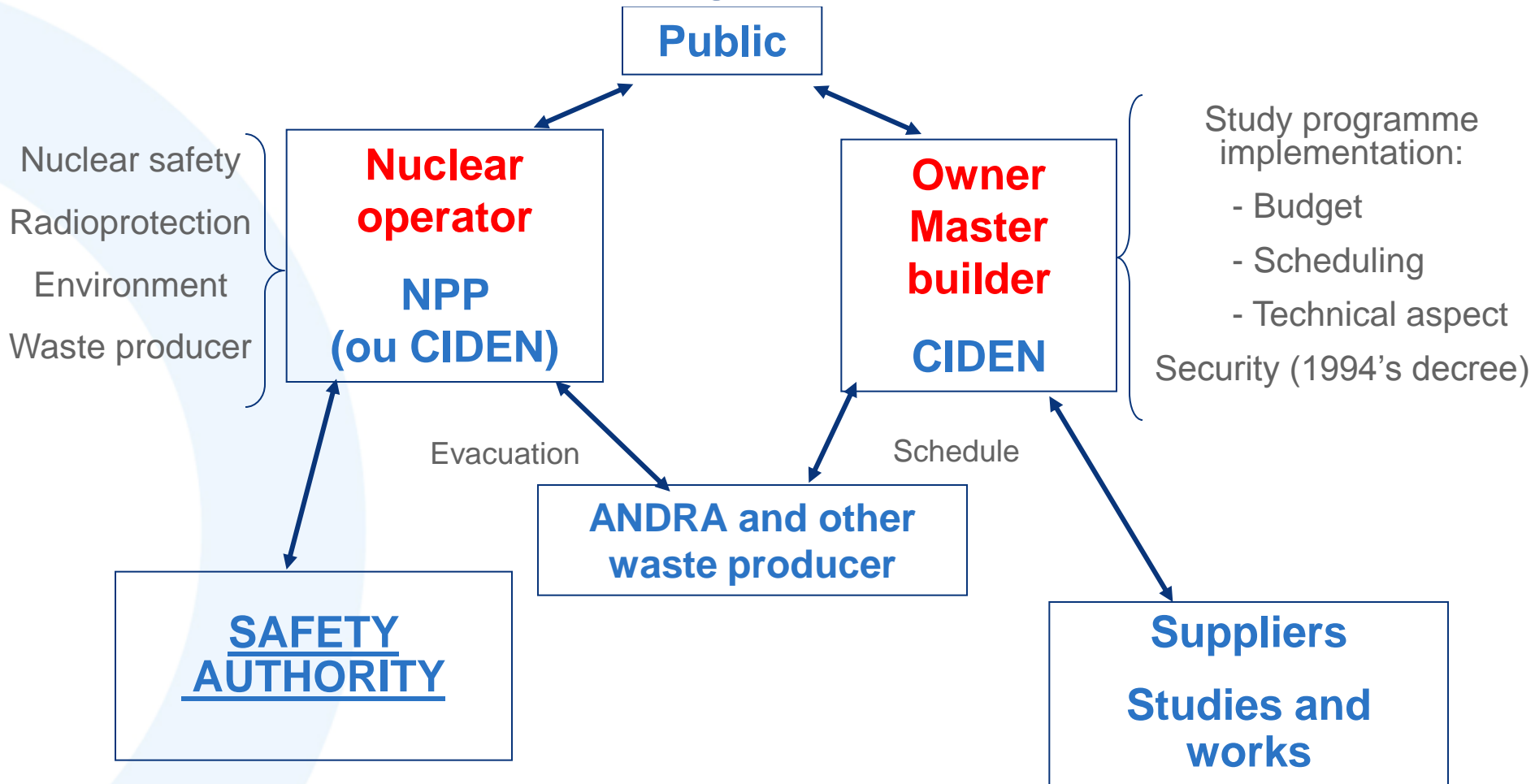
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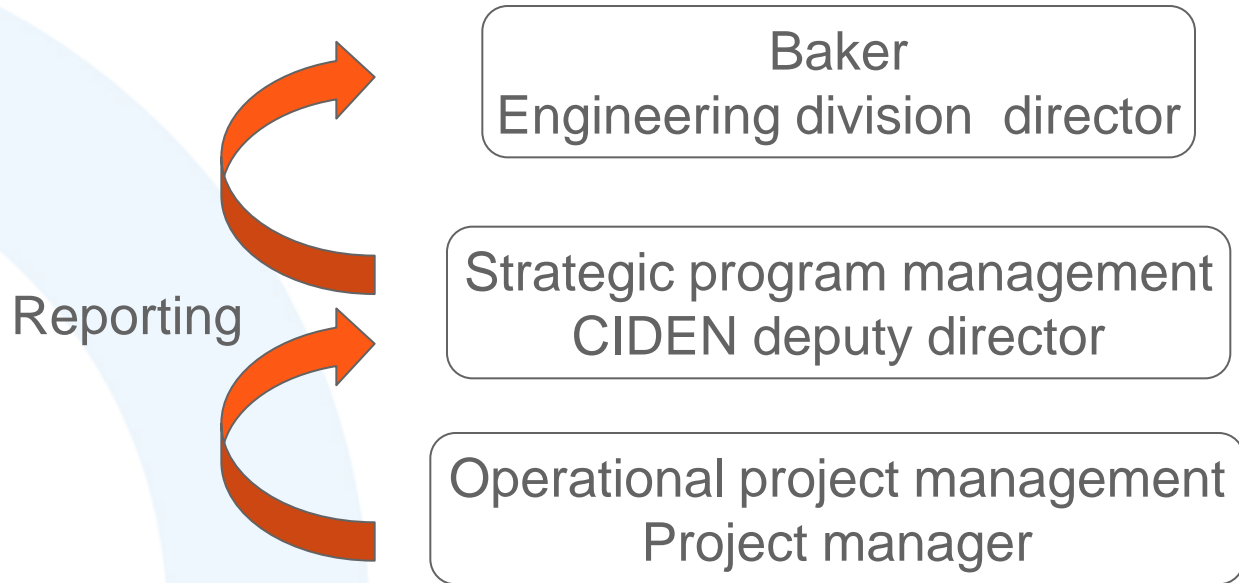
CIDEN inside EDF



Decommissioning responsibilities in EDF organization

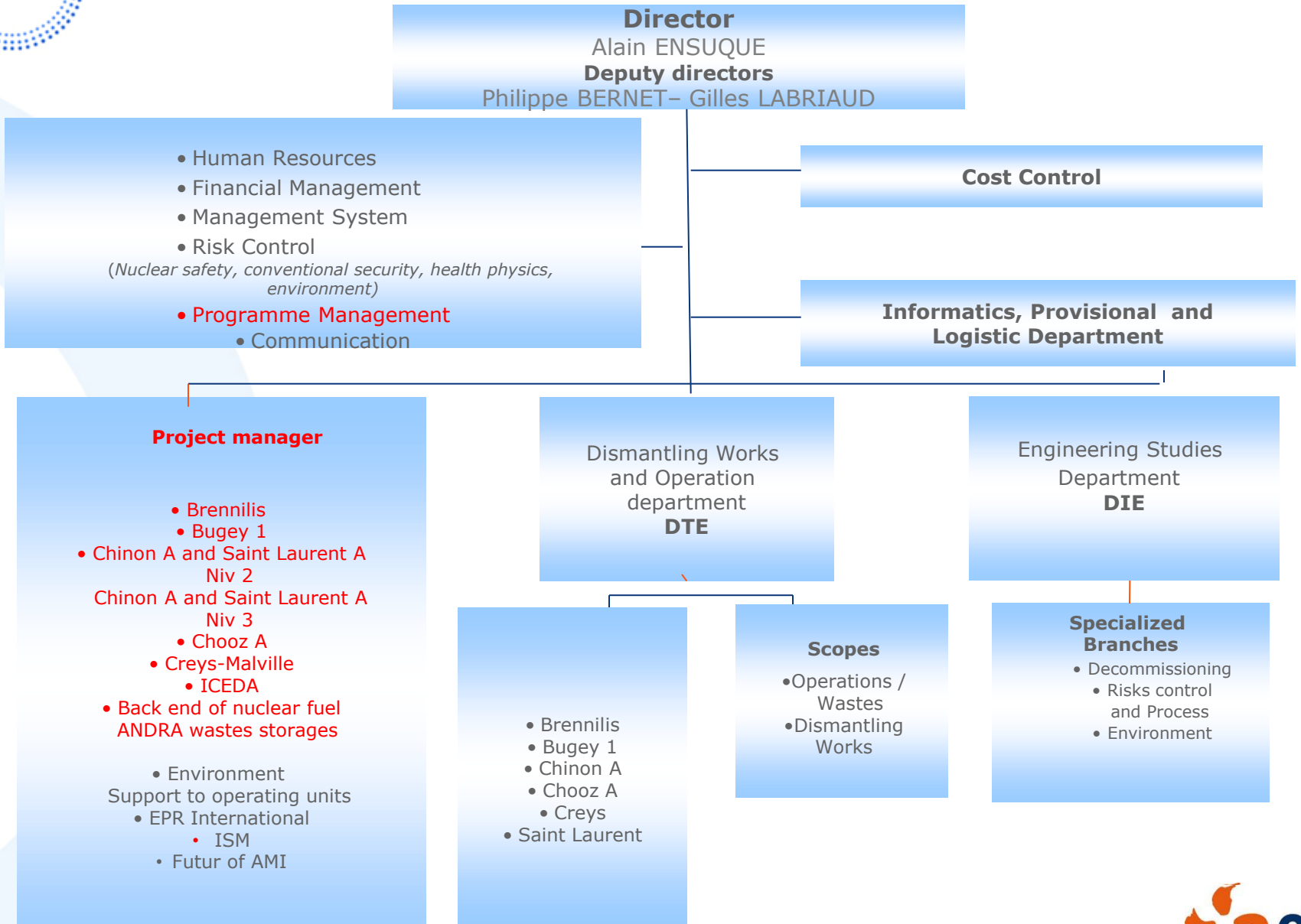


CIDEN Project management



CIDEN Organization IS focusing on project management with supporting structure

CIDEN Organization





Reporting - Data management at various levels

- **Strategic level, for CIDEN management and backer**
 - Long term vision (scheduling, reference costs, waste, technical reference scenario)
 - A data book updated every 3 years : strategic scheduling, important hypothesis, expenses, engineering and operation resources, waste production by project and sub project and spreading until the end of project
 - Risk and solution analysis
 - Prepared by program manager and project managers
 - Project agreement by project
 - Mid term vision (5 years) : Mid Term Plan include key stones and allocated resources
 - Global indicators allowing to control the projects evolution and data book adequacy: working and financial progress
 - Consolidated by program management
 - Risk review (semester)
 - Annual vision N+1 : Annual Achievement Contract includes annual important step and allocated resources
 - Monthly checking of business indicators (program management), project expenses and hours (financial support)



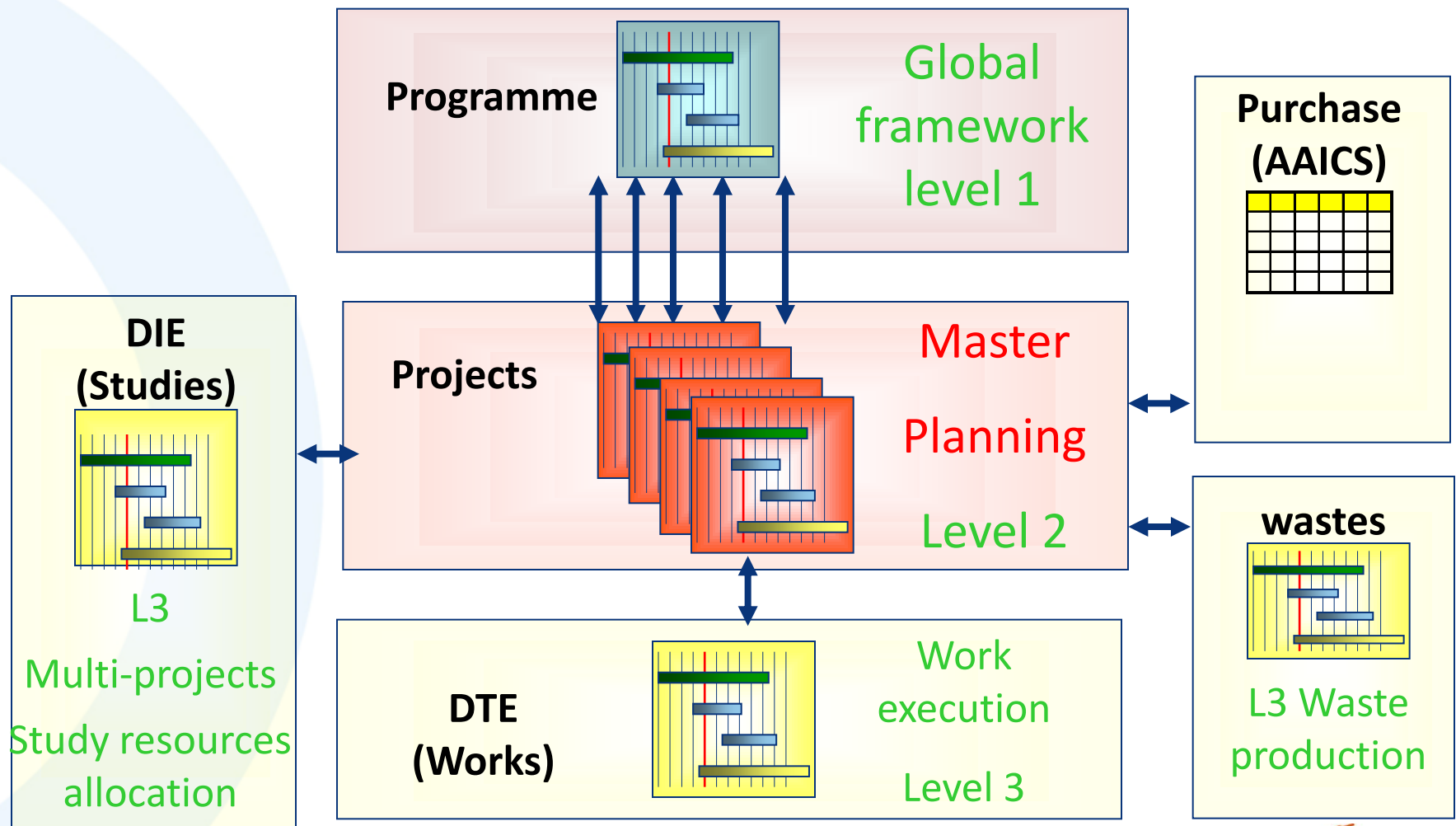
Reporting - Data management at various levels

- **Program/project level for CIDEN management**
 - Annual peer review (project team), quarterly project management chart examination, quarterly report (Program management)
- **Operational level, for project manager and project team**
 - Studies and works plan allowing resources allocations on each projects (project team)
 - Project scheduling quarterly updated according with resources allocations (planner, program management)
 - Project expenses monthly checking and new forecasting (financial support)
 - Project technical progress checking : significant actions (hierarchy, technical department)
 - Project risk management (action plan, progress): project team Lotus Notes software
- **Short term operational level, for project team and technical department**
 - Project weekly meeting to coordinate short term operations
 - Work detailed scheduling update (site, weekly basis)
 - As much as necessary treatment of real time issues (by useful means)



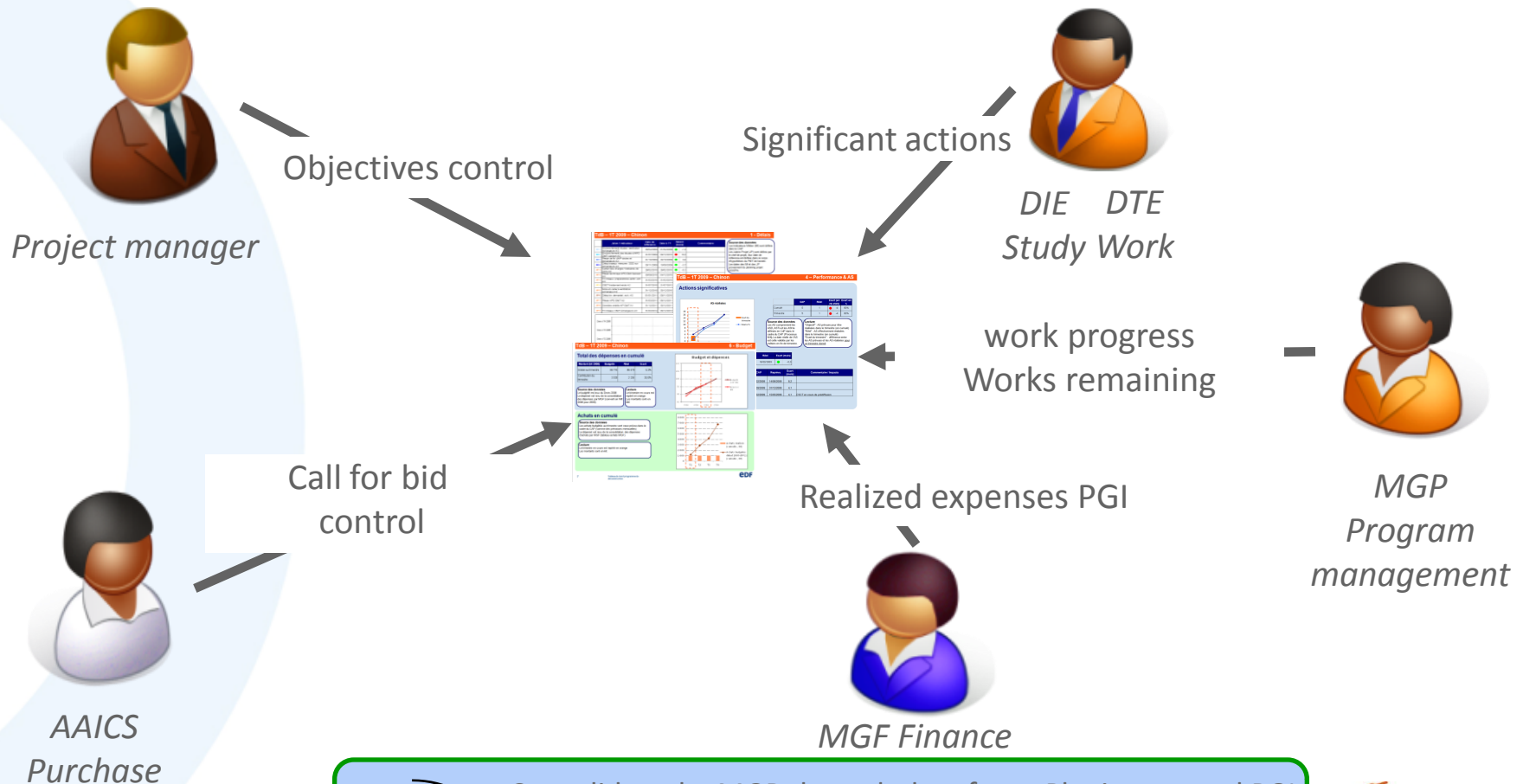
Planning used for project management

Project planning software Planisware (OGOPA), with miles stone planning sharing



Project quarterly management chart : global management

© Digest data from various CIDEN structures and purchasing division



Consolidate by MGP through data from Planisware and PGI
Software quarterly updated

Deadline, achievement and cost

Management chart include 6 charts for each project :

Deadlines

- Work indicators and project miles stone control

Achievement

- Project work and financial progress
- Significant actions achievement

Costs

- Realized purchase and others expenses

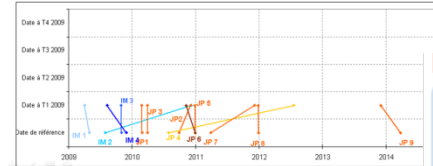
TdB – 1T 2009 – Chinon 1 - Délais

Item	Nom / Indicateur	Date de référence	Date à T1	Retard (mois)	Commentaire
IM 1	Enrichissement études ventilation (echangeurs A3)	30/04/2009	01/04/2009	-1,0	
IM 2	Enrichissement des études GAFD DMT Casson A2	31/07/2009	08/12/2010	16,5	
IM 3	Revue de fin d'AP Provoies et échangeurs A2	31/10/2009	30/10/2009	0,0	
IM 4	DMT travaux mesures DCC sur échangeurs A2	30/11/2009	10/08/2009	-3,7	
JP 1	Carbur des charges Vestibule de Casson A2	28/02/2010	28/02/2010	-0,1	
JP 2	Revue technique APD DMT Casson A2	30/09/2010	04/12/2010	2,2	
JP 3	Pin travaux préparatoires venté. éch. A2	31/03/2010	31/03/2010	0,0	
JP 4	CSCC traitement vireté A2	31/07/2010	21/07/2012	34,0	
JP 5	Mise en service ventilation (echangeurs A3)	31/12/2010	30/12/2010	0,0	
JP 6	Début trv. demarcel. éch. A3	01/01/2011	09/11/2010	-1,8	
JP 7	Revue APD DMT A2	31/03/2011	06/12/2011	8,3	
JP 8	Données entrée AP DMT A1	31/12/2011	30/12/2011	0,0	
JP 9	Pin travaux DMT échangeurs A3	31/03/2014	06/12/2013	-3,8	

Source des données
Les Indicateurs Matur (IM) sont définis dans le CAP.
Les Jalons Projet (JP) sont définis par le chef de projet, leur date de référence est définie dans le corps d'hygiène du PMT de l'année. Les dates des IM et des JP proviennent du planning projet OGDPA.

Lecture
● Retard inférieur à 0,5 mois
● Retard entre 0,5 et 3 mois
● Retard de 3 mois ou plus

Lecture
Chaque ligne donne l'évolution des dates de TIM ou du JP de trimestre en trimestre



Example of significant actions chart

TdB – 1T 2009 – Chinon 4 – Performance & AS

Actions significatives

	CAP	Réel	Ecart (en nb d'AS)	Ecart en %
Cumulé	5	1	-4	80%
Trimestre	5	1	-4	80%

Source des données
Les AS comprennent les ASD, AS Tx et les ASHa définies en CAP dans le cadre du CAP (Processus M4). La date réelle de l'AS est celle validée par les metiers en fin de trimestre.

Lecture
"Objectif" : AS prévues pour être réalisées dans le trimestre (en cumulé)
"Réel" : AS effectivement réalisées dans le trimestre (en cumulé)
"Ecart du trimestre" : différence entre les AS prévues et les AS réalisées pour un trimestre donné

Type d'AS **AS terminées dans le trimestre**

Type d'AS	CAP	Réel	Ecart (mois)
ASD	28/02/2009	18/02/2009	-0,3

Type d'AS **AS en retard de plus de deux mois**

Type d'AS	CAP	Repris	Ecart (mois)	Commentaire / Impacts
ASD	28/02/2009	14/08/2009	8,2	
ASD	30/09/2009	31/12/2009	4,1	
AST	28/02/2009	15/05/2009	4,1	CSCC en cours de prédifusion

Example of purchase and other expenses chart

TdB – 2T 2010 – ChoozA 6 - Budget

Devis programme : Dépenses en cumulé

Montant (k€ 2008)	Budgété	Réel	Ecart
Global au trimestre	113 783	108 911	4,3%
Contribution du trimestre	7 662	6 339	9,4%

Budget et dépenses

CAP : Achats en cumulé

Source des données
Les achats budgétés au trimestre sont ceux prévus dans le cadre du CAP pour le projet. Le dépense est issu de la consolidation des dépenses d'achats par MCF (tableau achats MCF).

Lecture
Le trimestre en cours est repéré en orange. Les montants sont en k€.

CAP : Main d'œuvre, induits et taxes

	Main d'œuvre OGDEN (k€)	Induits et taxes (k€)
CAP (Pis RPI)	5776	2556
RPI	5776	2556
Réalisé fin T2	3454	1348
% T2 / CAP	60%	53%

Source des données
Les chiffres sont fournis par MCF (Annexe 3 du reporting programme - état des reprises sur provisions).



Work and finance progress indicator

- ◎ Following baker requirement work progress indicator is calculated and issued on a quarterly basis
 - Subproject ratio is proportional to its financial ratio within the project
 - Each subproject includes limited representative tasks or operations. Progress measurement is based on unit of work (% , miles stone, waste weight), with a ratio proportional to the task or operation cost within the subproject
 - Passed mile stone are recorded and compare to the program reference and the new forecast (Excel file)
- ◎ Work progress indicator is compared to the project financial progress ratio
- ◎ Allow to globally know if projects and programme are progressing in the same way and if expenses progress is coherent with works progress (time evolution comparison)

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Project regulatory achievement

Project	Authorisation/safety case file issue	Public enquiry	Decommissioning /creation decree
Creys Malville	06/05/03	April 04	21/03/06
Brennilis	25/07/08	October 09	27/07/11 (partial)
Chooz A	30/11/04	August 06	29/09/07
Bugey 1	29/09/05	August 06	20/11/08
St Laurent A	11/10/06	January 07	18/05/10
Chinon A3	29/09/06	March 07	18/05/10
ICEDA	05/10/05 (creation)	June 06	23/04/10 (creation)
Chinon A1 A2*	/	/	/

*Plants in care and maintenance situation