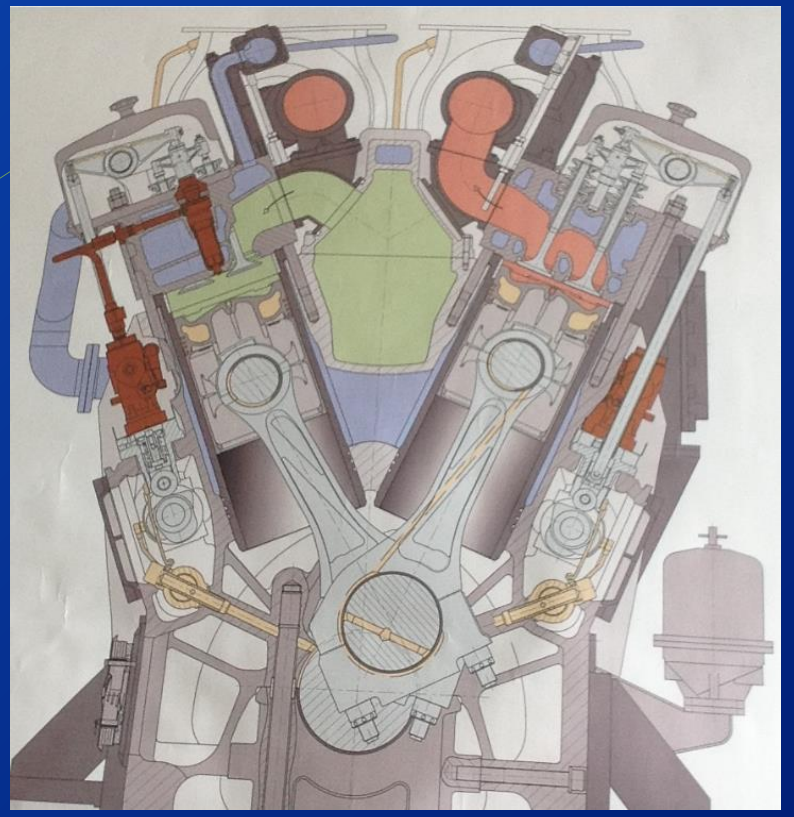


Commercial Grade Dedication applied to diesel engine power components

Virginie CALONNE-CHATELEE – EDF – Supply Chain – Direction Qualité Industrielle

Context

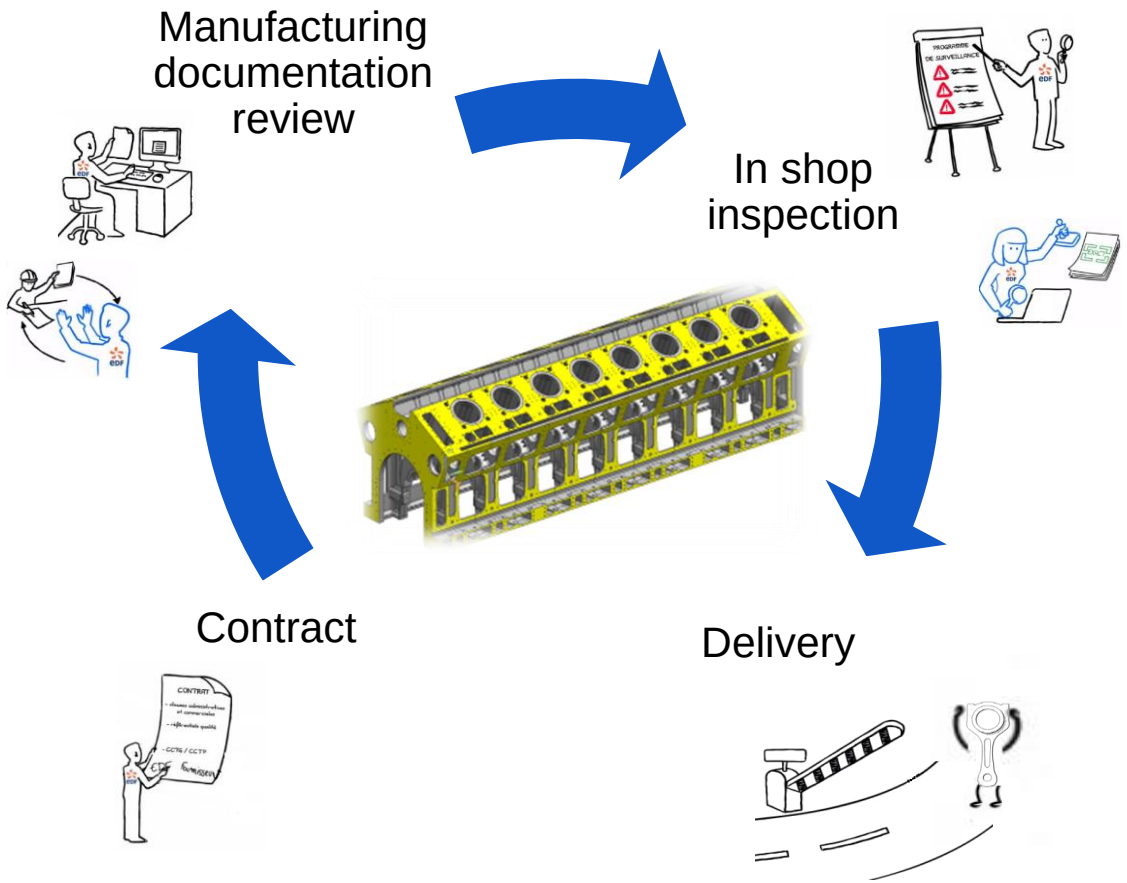
- **Evolution of the maintenance strategy** of the diesel engine : removal of installed components and replacement with new components instead of reconditioning them.

  → Ordering a large number of parts.

- **Constrained intervention schedule.**

- **EDF classical manufacturing monitoring doctrine** not compatible with the schedule due to delays in relation with documentary review and with in shop witness and hold points.

➔ The historical diesel engine manufacturer proposed EDF to use **components intended for diesels used in the navy**.



Commercial Grade Dedication as an opportunity

- **The objectives transmitted to the department ensuring the manufacturing quality were :**
  - The use of components intended for diesels for navy,
  - No in shop inspection,
  - Ensure a high-quality level,
  - Maintain the qualification to Accidental Conditions,
  - Comply with regulation.

➔ Commercial Grade Dedication according to EPRI NP-5652 and TR-102260 was applied for the first time.

- **The technical evaluation of the supplier was not required because we knew it well.**

Commercial Grade Dedication

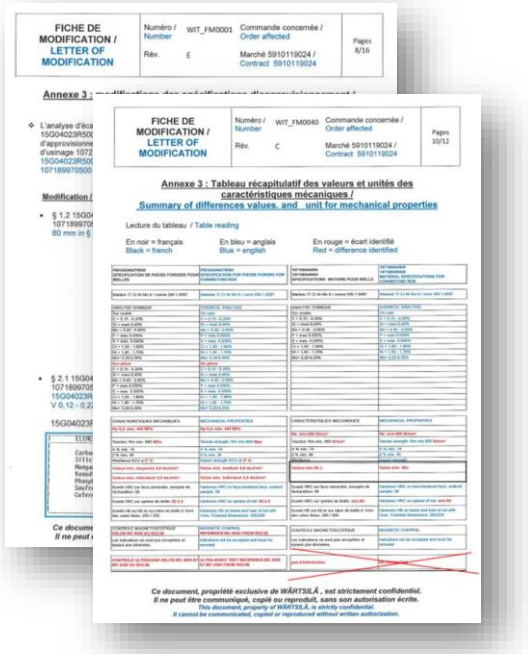
1st Step – Design suitability

- **The diesel engine is a K3 Equipment Qualified to Accidental Conditions (earthquake resistant).**

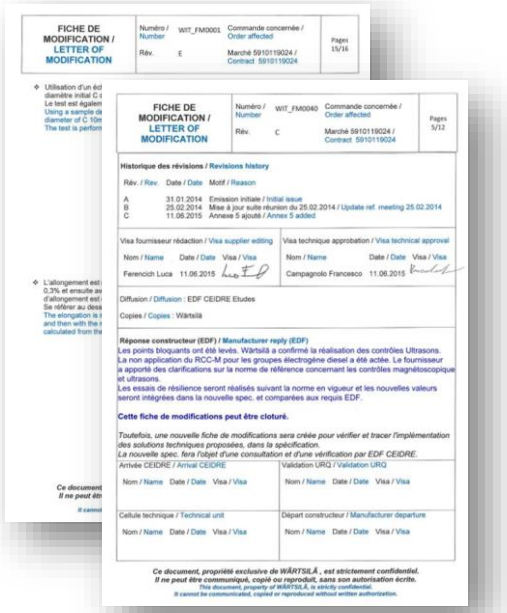
  → It was verified that the changes in the design and in the quality of the components did not compromise the qualification.

  → 88 modification sheets of the equipment were analyzed and approved.

Nuclear requirements

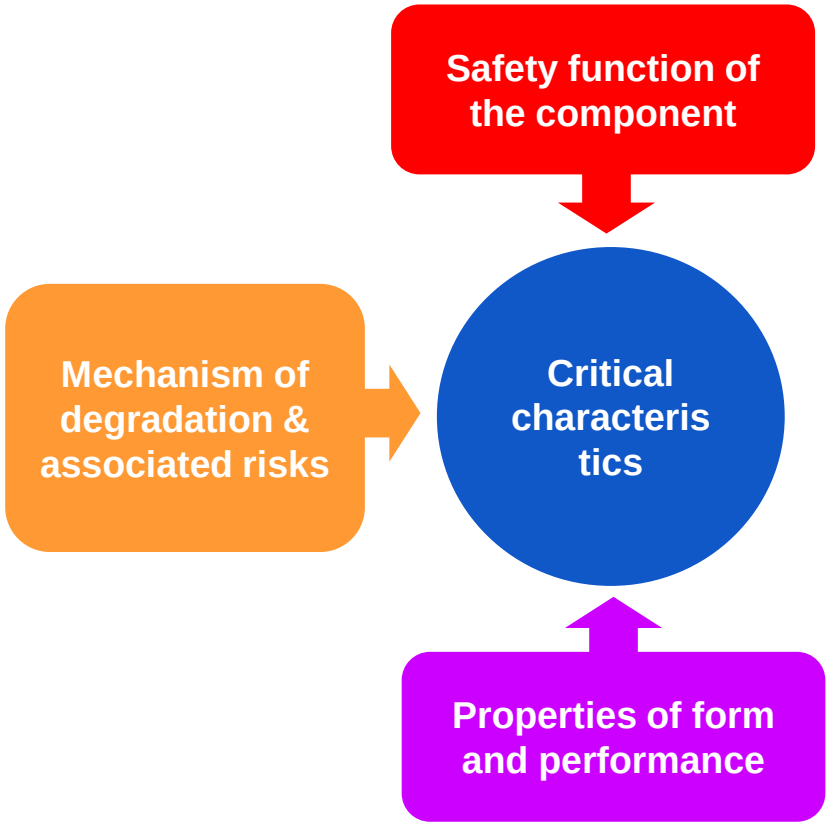


Navy requirements

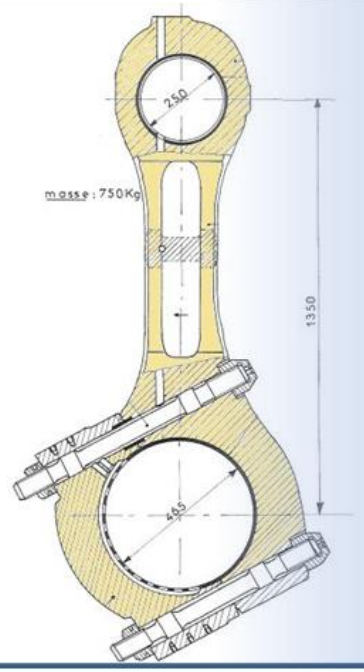


Commercial Grade Dedication

2nd Step – Identification of critical characteristics with acceptance criteria



✓ Conrod



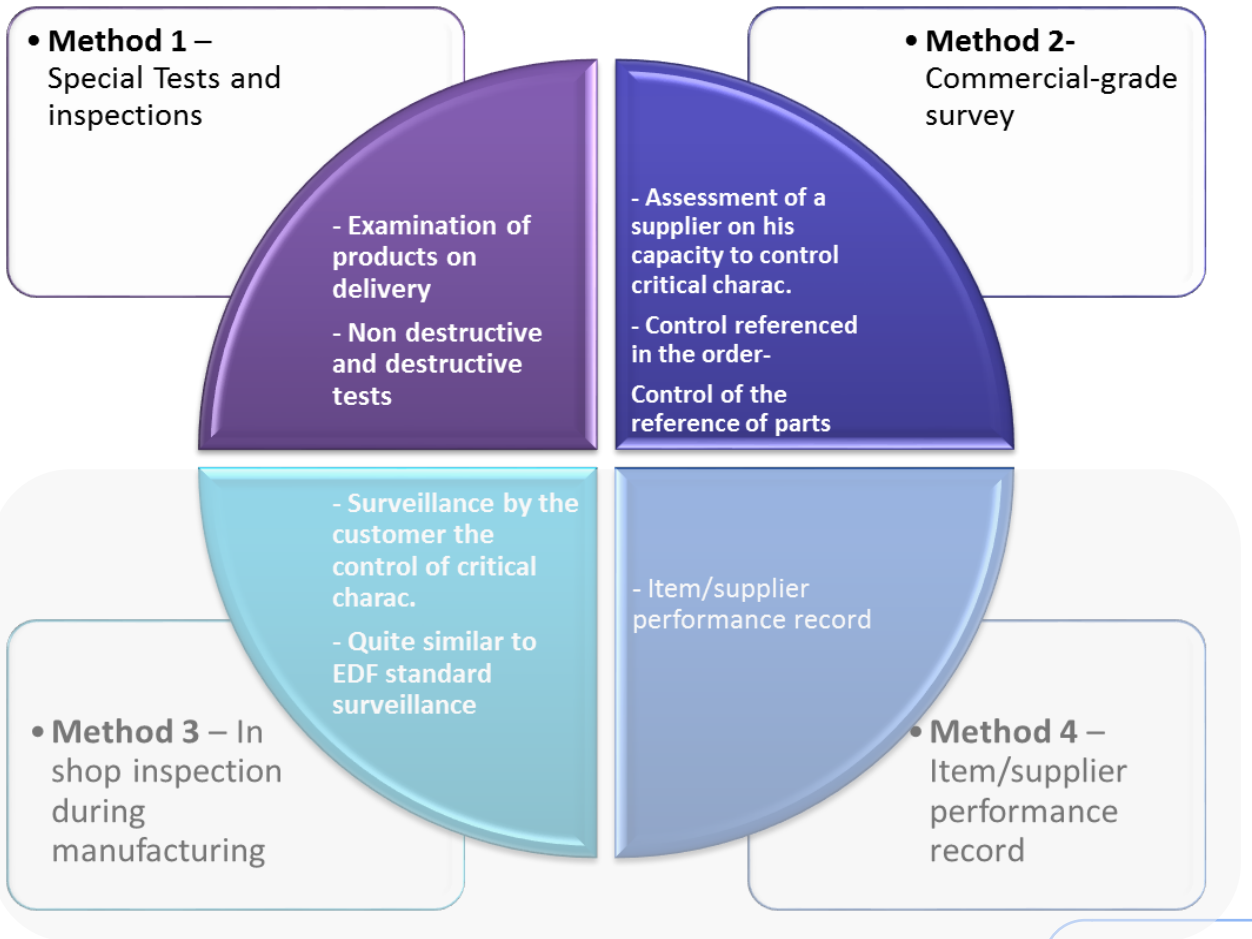
1 – Part reference
2 – Chemical Composition
3 - Rm, Rp0,2, E, A% (Room temp & op. temp)
4 – impact strength (20°C)
5 - Hardness
6 - Surface defects
7 - Volumique defects
8 - Dimensional
9 - Roughness
10 - Mass
11 – Oil supply channels

Commercial Grade Dedication

3rd Step – Choice of verification method for critical characteristics

	Verification Method
1 – Part reference	Méthode 1
2 – Chemical Composition	Méthode 1
3 - Rm, $Rp_{0,2}$, E, A% (Room temp & op. temp)	Méthode 1
4 – impact strength (20°C)	Méthode 1
5 - Hardness	Méthode 1
6 - Surface defects	Méthode 1
7 - Volumique defects	Méthode 1
8 - Dimensional	Méthode 1 ou 2
9 - Roughness	Méthode 1
10 - Mass	Méthode 1
11 – Oil supply channels	Méthode 1

The sampling for tests was performed according to the EPRI recommendations on manufacturing batches of parts.



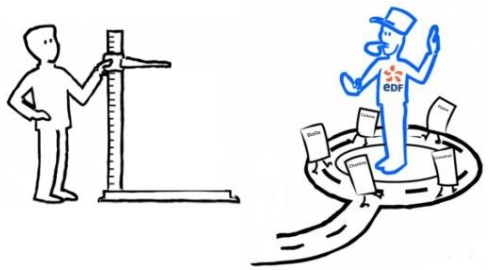
Commercial Grade Dedication

4th Step – Verification of critical characteristics

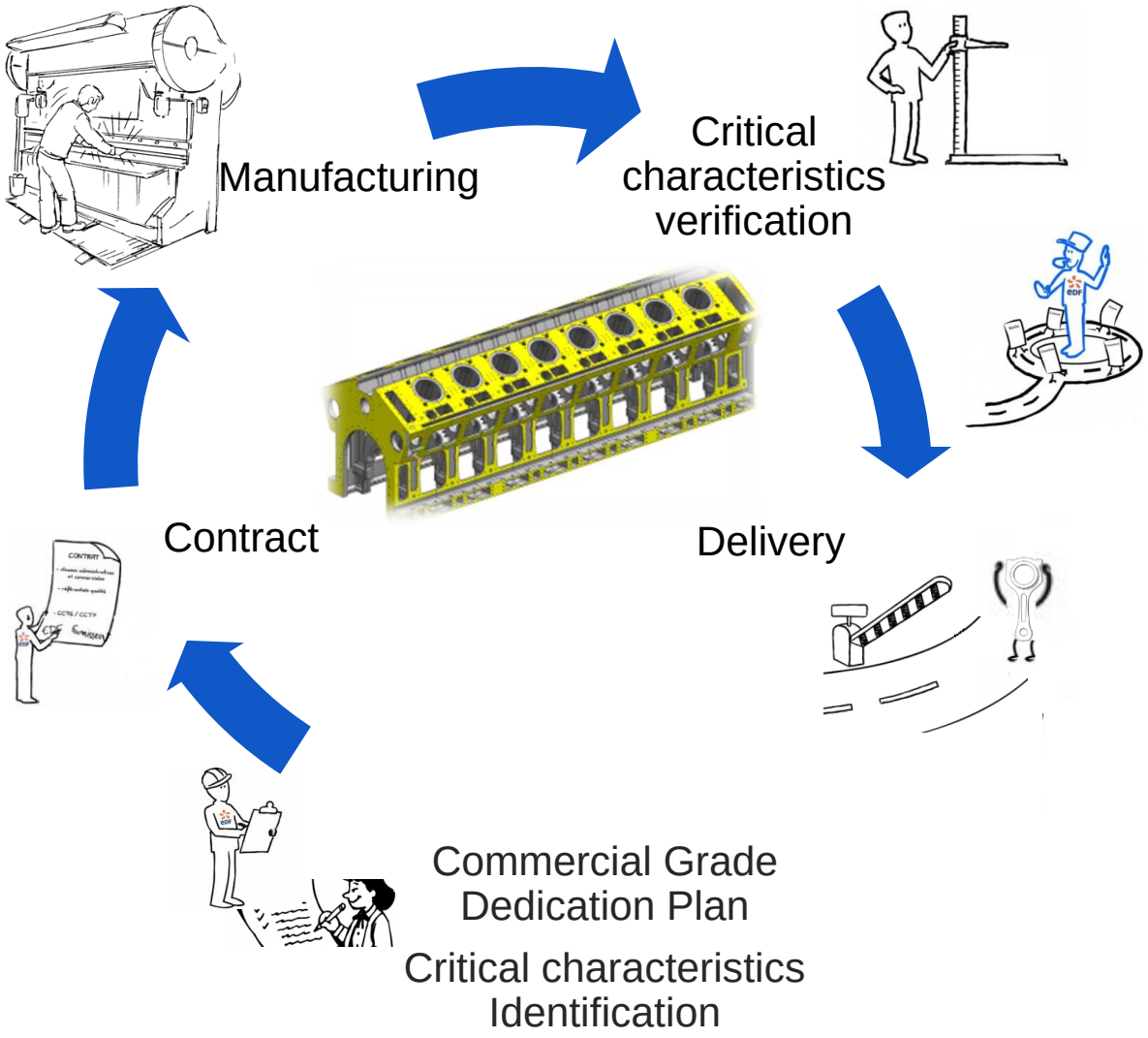
- **Before implementing the method, we had an exchange with our regulation authority.**
  → The regulator was not opposed to the methodology.

- **The tests were performed by the supplier and monitored by the inspectors of EDF.**

- **The verifications of the critical characteristics are IPSN activities.**



Conclusions



With Commercial Grade Dedication :

- **Delivery times** were divided by 3
- **Cost savings** were difficult to estimate
- **Hight quality and safety** were preserved

Thank you !