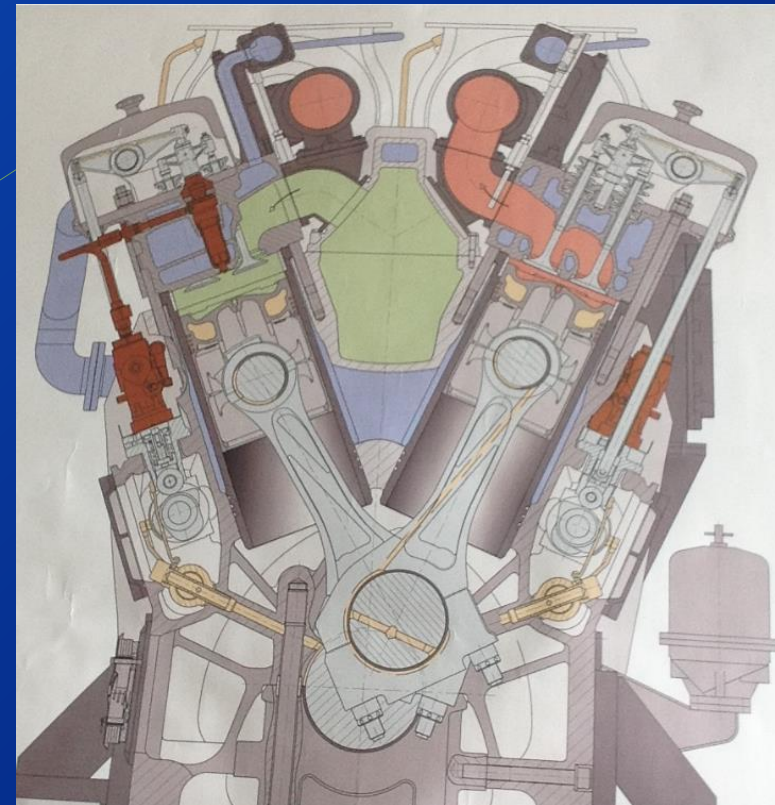




Commercial Grade Dedication applied to diesel engine power components

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.**

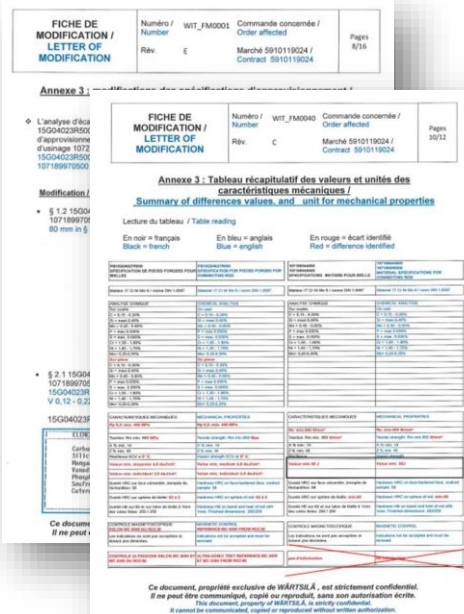


Commercial Grade Dedication

1st Step – Design suitability

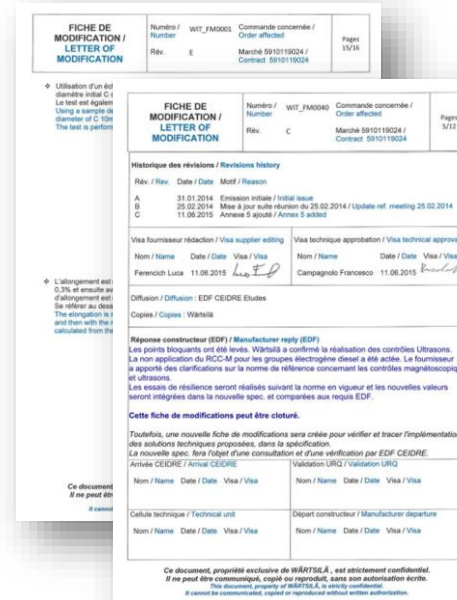
- The diesel engine is a K3 Equipment Qualified to Accidental Conditions (earthquake resistant).
 - It was verified that the changes in the design and in the quality of the components did not compromise the qualification.
 - 88 modification sheets of the equipment were analyzed and approved.

Nuclear requirements



This is a technical document titled 'FICHE DE MODIFICATION / LETTER OF MODIFICATION' for a nuclear application. It includes a header with document identification (WIT_FM0003), revision (E), and project details (Marché 5910119024). The main body contains 'Annexe 3: Tableau récapitulatif des valeurs et unités des caractéristiques mécaniques / Summary of differences values and unit for mechanical properties'. This section includes a table with columns for 'Lecture du tableau / Table reading' and 'En rouge = Avaré identifié / Red = difference identified'. The table lists various mechanical properties and their values. The document is signed by 'EDF' and includes a confidentiality notice at the bottom: 'Ce document, propriété exclusive de WARTSILA, est strictement confidentiel. Il ne peut être communiqué, copié ou reproduit, sans autorisation écrite.' (This document, property of WARTSILA, is strictly confidential. It cannot be communicated, copied or reproduced without written authorization.)

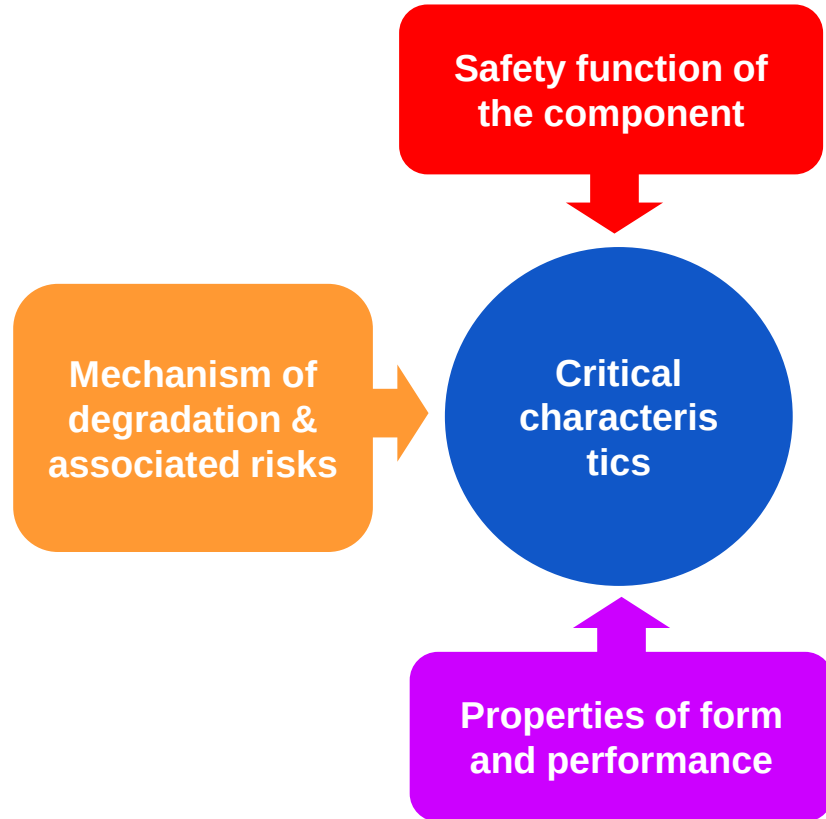
Navy requirements



This is a technical document titled 'FICHE DE MODIFICATION / LETTER OF MODIFICATION' for a Navy application. It includes a header with document identification (WIT_FM0003), revision (E), and project details (Marché 5910119024). The main body contains a 'Historique des révisions / Revisions history' table with columns for 'Rév. / Rev.', 'Date', 'Motif / Reason', and 'Date / Date'. The table lists revisions A, B, and C. The document is signed by 'EDF' and includes a confidentiality notice at the bottom: 'Ce document, propriété exclusive de WARTSILA, est strictement confidentiel. Il ne peut être communiqué, copié ou reproduit, sans autorisation écrite.' (This document, property of WARTSILA, is strictly confidential. It cannot be communicated, copied or reproduced without written authorization.)

Commercial Grade Dedication

2nd Step – Identification of critical characteristics with acceptance criteria



✓ Conrod

Technical drawing of a conrod (connecting rod) showing dimensions and mass. The drawing includes a top view with a diameter of 25.0 and a side view with a length of 135.0. The mass is indicated as 750Kg.

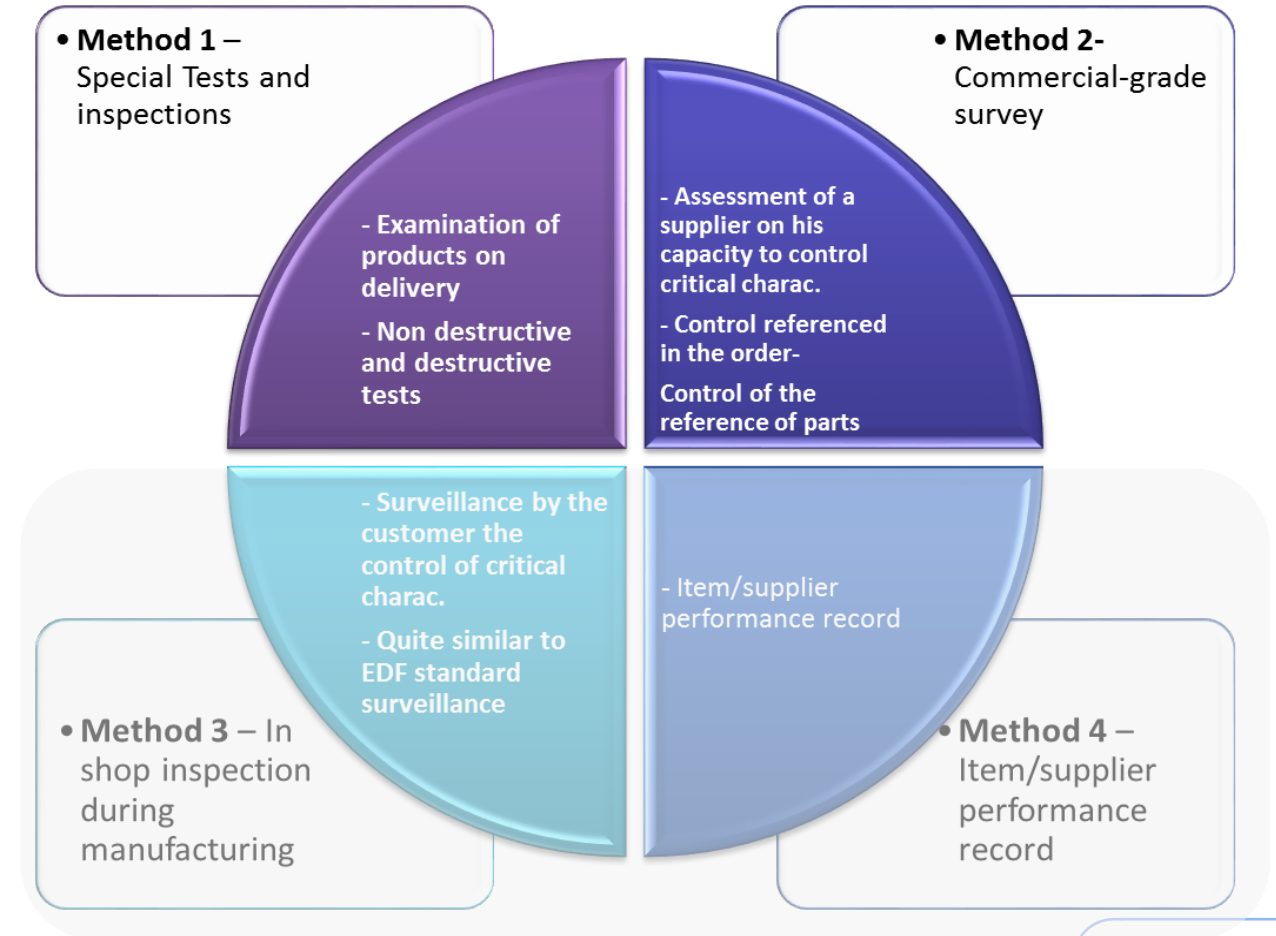
1 – Part reference
2 – Chemical Composition
3 - Rm, Rp0,2, E, A% (Room temp & op. temp)
4 – impact strength (20°C)
5 - Hardness
6 - Surface defects
7 - Volumique defects
8 - Dimensional
9 - Roughness
10 - Mass
11 – Oil supply channels

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, Rp0,2, 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

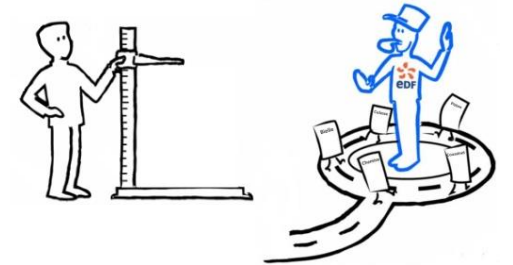
The sampling for tests was performed according to the EPRI recommendations on manufacturing batches of parts.



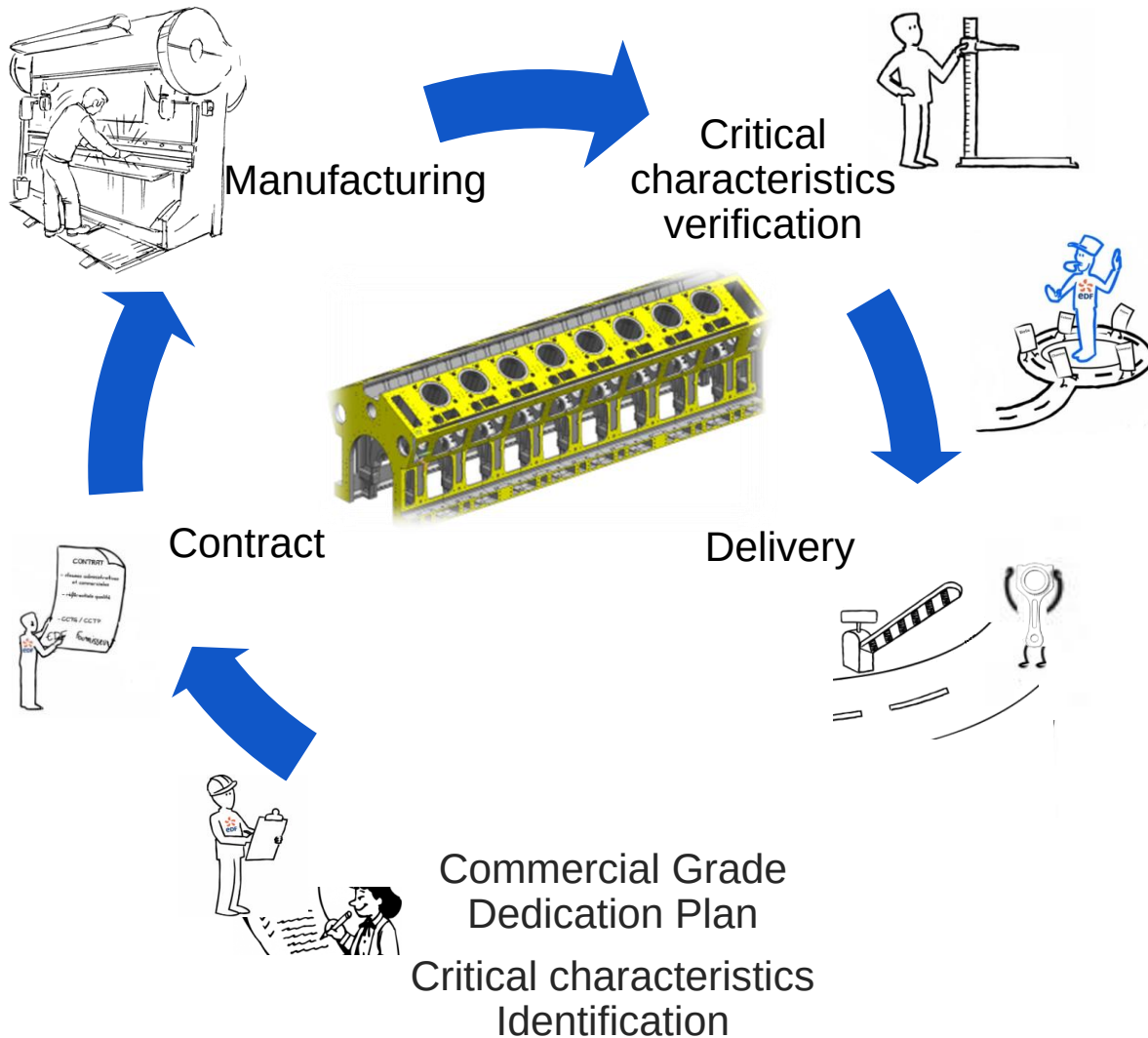
Commercial Grade Dedication

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.**

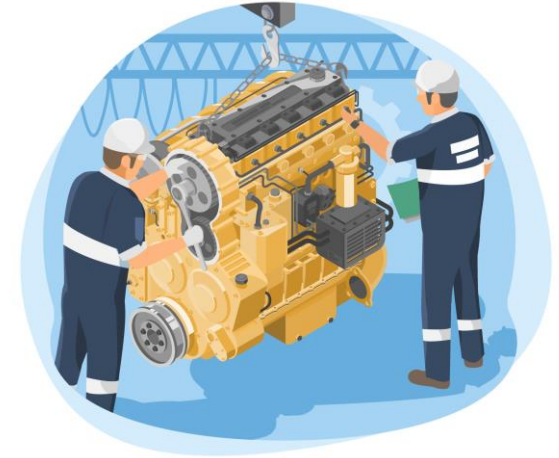


Conclusions



With Commercial Grade Dedication :

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



Thank you !

