

SICODYN

pour des Simulations crédibles via
la COrrélation calcul-essai et l'estimation
d'incertitudes en DYNAmique des structures

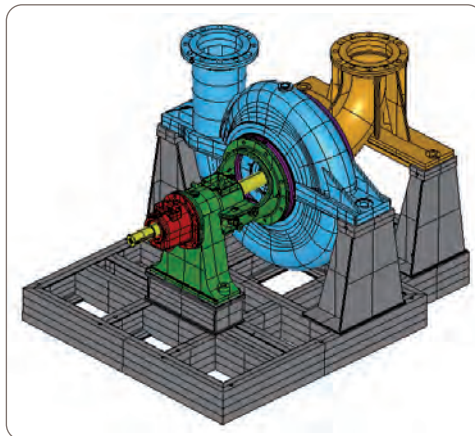


Quantification and improvement of the credibility of numerical models in structure dynamics thanks numerical-experimental correlation and estimation of uncertainties: demonstration on an industrial structure in complex environment

- ▶ Application fields: electricity production, petrol exploitation, transport and aeronautic industries
- ▶ Scientific structuration:
 - Observation of the experimental variability (related to specimen, measurement means, treatment of measured data) thanks to an experimental benchmark
 - Observation of the total numerical variability thanks to a numerical benchmark
 - Numerical characterisation of model form uncertainties and parametrical uncertainties
 - Confrontation of observed and calculated variabilities and elaboration of a data base of methods to a priori estimate the uncertainties function of the problem type

TECHNOLOGICAL OR SCIENTIFIC INNOVATIONS

- ▶ Organisation of an experimental benchmark in situ, with independent teams, in view of observing the variability of modal properties and dynamic responses
- ▶ Organisation of a numerical benchmark in condition of a study performed by a society, in view of observing the total numerical variability of a dynamic simulation
- ▶ Application of methods tested on academic structures to complex industrial large number of degree of freedom structures
- ▶ Improvement of the modelisation at macro level of bolted structure assemblies
- ▶ Taking into account the environment, represented by complex boundary conditions
- ▶ Model improvement by adaptation and comparison of numerical-experimental correlation methods
- ▶ Numerical estimation of the model form uncertainty, and not only the parametrical uncertainty
- ▶ Improvement of the model robustness relative to uncertainties
- ▶ Confrontation of observed and calculated variabilities and recommendation for the use of numerical methods to a priori estimate the result confidence
- ▶ Establishment of empirical laws to a priori estimate the credibility related to a given dynamic simulation



STATUS - MAIN PROJECT OUTCOMES

Not yet begun.

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DE FRANCHE COMTÉ,
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PROJECT DATA

Coordinator:
EDF

Co-label:
PNB

Call:
FUI 12

Start date:
January 2012

Duration:
40 months

Global budget (M€):
4.5

Funding (M€):
1.7

Related Sytematic project(s):
CSDL, EHPOC, ROMMA