



**New** Project 2015

### PRESSING NEEDS FOR SEALS /BEARING SOFTWARE DEVELOPMENT/UPDATE

XLTRC<sup>2</sup> software suite's greatest value is the ready access and seamless integration to a number of tools for prediction of rotordynamic force coefficients for a myriad of journal bearing types, liquid and gas annular seal types, and squeeze film dampers.

Software tools for journal bearings, dampers, and gas & liquid seals have seen no changes and documented updates since the 1990s'. Many of these tools need of urgent enhancements, some simple and others more detailed. For example, many programs need of a *User's* manuals and examples of application, including cautionary warnings on examples not applicable to the tool.

Nonetheless, prior to the demise of engineering analysis, XLTRC<sup>2</sup>software tools will still be used for a few more years (a decade or so). In some circumstances, the future will call for engineered solutions with quick tools that have seen some experimental validation.

The project aims to update various XLTRC<sup>2</sup>software tools for prediction of rotordynamic force coefficients in a number of mechanical elements: bearings and seals. These programs, still based on fundamental physics, will aim to target (new) products available in practice, some even already tested. These applications include

- a) Interlocking improved (gas) labyrinth seals
- b) Integral squeeze film dampers → fluid inertia force coefficients
- c) Porous gas bearings (hydrostatic and hydrodynamic)
- d) Squeeze film damper: add feed holes and a model for air ingestion
- e) Shallow depth grooved seals for pumps (funded separately by a pump co.)