

INTERNSHIP SUBSEA PIPELINES - LATERAL BUCKLING TOOLS



INTRODUCTION:

Buckling and walking phenomena are critical complex phenomena for pipelines and spools design and require large number of detailed finite element analyses.

Oil & Gas industry is keen to perform this type of studies from pre-bid to brownfield studies as outcomes are recognised to account for significant cost in Projects.

Size and complexity of lateral buckling studies have been increasing in the recent years and therefore a minimum level of automatization of such studies is required to remain competitive.

PRINCIPIA has a number of FE tools to perform these studies with a need to standardise these tools and develop automatic and efficient pre and post-processing tools.

SCOPE OF WORK:

The scope of work includes the 3 following tasks:

- ✓ Introduction to Lateral Buckling studies and state of the art of existing tools
- ✓ Definition of the Pre-processing / Post-processing tools
- ✓ Development and Validation of the Pre-processing / Post-processing tools

Introduction to Lateral Buckling studies and state of the art of existing tools

Introduction to lateral buckling phenomena and associated objectives. Review of existing tools (pre & post – processing) will be performed. Objective will be to identify key components and assess main lateral buckling study challenges.

Definition of the Pre-processing / Post-processing tools

Based on the state of the art review, processing tools will be defined with a special attention paid to key points to be implemented to allow a more automatic and efficient use of these tools.

Development and Validation of the Pre-processing / Post-processing tools

Intern will be in charge of developing the new tools including the verification and validation of the developed tools based on a selection of existing reference cases.

DELIVERABLES:

1 - Technical report including:

- ✓ Introduction to buckling and brief review of the state of the art
- ✓ Main assumption and design parameters considered for the definition of the tools
- ✓ Presentation of the developed tools and validation results

2 – Pre & Post – processing tools in readable and editable format (Excel / Python – to be Agreed with Principia)

COMPETENCIES:

The following competencies will be of interest:

- ✓ First experience in finite element analysis (e.g. ABAQUS) and Python
- ✓ Experience in using Microsoft office (Excel/Word/PowerPoint/VBA)
- ✓ Fluency in English

GENERAL:

- ✓ Duration: 4 to 6 months
- ✓ Start date: Early 2020
- ✓ Location: PRINCIPIA offices in La Ciotat (Bouches du Rhône).