MULTI-TASKS BENCH
PLACIDE I

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SUMMARY

I Introduction

II Multi-tasks bench

III Cutting module/Eddy current location

IV Measurement module : Edge Finder

V Conclusion
I Introduction

This presentation introduces the technical capabilities of the multi-tasks (cutting operations and none destructive examinations) PLACIDE I bench:

Designed in early 2000, this multi-tasks bench named Placide still operates cutting tasks successfully today,

But… since a few years, we notice:

The profilometry and spectrometry modules are out of service,

Aging of secondary components on overall equipment,

Obsolescence of controllers makes maintenance difficult and expensive,

So, with our feedback, our laboratory decided to study and complete a new apparatus.
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II Multi-tasks bench

Technical specifications:
- Industrial 3 axis bench adapted to be used in hot cell,
- Modularity,
- Components resist to irradiation,
- Motor rotation speed up to 5000 tr/mn,
- Longer stroke up to 1500 mm,
- Flexibility to chuck any geometry of pieces (structure, plate, rods...),
- The driving can be realized by a numerical control.

Overall view of the bench
II Multi-tasks bench

I Cutting module/Eddy current technique

Coated drill saw from 0.2 mm width

2 Tool holder

3 Edge finder

4 The Profilometry and spectrometry modules are out of service
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This cutting module, although requiring intricate operations in a **hot cell** with specially adapted equipment and a very trained personnel, enables:

1. **(1) high-precision cutting** (better than 0.1 mm)

2. **(2) a good reproductibility** of the Eddy current signals has been observed.
III Cutting module/Eddy current location

1°) Calibration is necessary to evaluate the cutting tool/E.C. sensor distance $D$. $D$ is slightly different according to each sensor,

2°) Locating fuel edge by Eddy current technique $X_0$,

3°) Determinate exactly the cutting location $X_1 = X_0 + D$
III Cutting module/Eddy current location

Drill saw

Cutting module
X₁

D

X₀

Eddy current sensor

Gap #0.1 mm

Fuel → Plate

Output EC sensor = f (Sensor location)
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IV Measurement module: Edge finder

Edge Finder (Sketch)
(Made from 1/2" printer shaft)
IV Measurement module: Edge finder

Φ diameter edge finder

Plate length $La = Z_1 - Z_2 - \phi$

Immediat advantage: no electrical connections
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Multi-tasks PLACIDE I is always operating in LECA Facility after almost 13 years, mainly for cutting operations.

**BUT....**

The profilometry and spectrometry modules are out of service,

Some secondary pieces are difficult to maintain in hot cells and need to be replaced,

Obsolescence of electronic parts will make maintenance difficult and expensive,

The controllers are no longer manufactured,

Our stock of spare parts is limited,

A working group has been formed to study a new bench that takes advantage of our feedback and new technologies,

So, the project completion schedule envisages the commissioning of 3 benches:

- **2 no destructive benches for september 2014,**
- **1 cutting bench for june 2015.**