

CERTIFICADO DE CONCLUSÃO

Instituto Brasileiro de Petróleo e Gás hereby grants this certificate to

Luis Felipe Souza Braça Carreira,

for participating in the **Pipeline Defect Repair Masterclass,**

on September 8th, 2025, with a total duration of 6 hours and 30 minutes.

Rio de Janeiro, September 8th, 2025



Karen Cubas
Gerente UnIBP



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1. Fundamentals of Non-Destructive Evaluation Techniques and Technologies

- Magnetic Particle Inspection (MPI), pit gages and laser surface profilometry
- UT shear-wave and phased array, Eddy current probes, IWEX, TFM, and CT

2. Common Pipeline Repair Systems

- Definitions of temporary and permanent repairs: ASME and PHMSA
- Buffing/grinding
- Type B and A metallic sleeves
- Metallic compression sleeves
- Composite sleeves: e-glass and carbon fiber
- Mechanical bolt-on dampers
- Hybrid repair sleeve systems

3. Repairing Corrosion

- Formation of internal and external general corrosion, pitting corrosion, selective weld corrosion, and the factors that can make them grow
- Corrosion defects that require repair and allowable repair options

4. Repairing Cracks and Seam Weld Defects

- Formation of cracking (stress corrosion cracking, hydrogen induced cracking, and fatigue cracks) and seam weld defects (lack of fusion, cold welds, hook-like defects and stitching) and the mechanisms that can make them grow
- Assessment methods and allowable repair options

5. Repairing Plain Dents and Dents with Damage

- Formation of dents and dents with gouges, cracks, or corrosion and what can make them grow
 - Dents that require repair and the allowable repair options
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