AIMEN Technology Centre

Innovación y tecnología
Innovation & Technology

RUGGERO BERTANI
European Geothermal Innovation Award 2021

ENDORSED NOMINATION
We are an innovation and technology centre specialized in research and in providing technological services in the field of MATERIALS, ADVANCED MANUFACTURING PROCESS and INDUSTRY 4.0

- **690** R&D&i Projects
  - In the last 10 years
- **6** Active Patents
  - As of 31/12/2020
- **+500** Clients
  - Annual average
  - In the last 5 years
- **250** Employees
  - 39 PhDs
  - 61% men
  - 39% women
- **15,6 M€** Anual Income
  - 2019
- **292,435** Technical Reports
  - As of 31/12/2020

We are experts in
- Joining Technologies
- Advanced Materials
- Industrial Robotics
- Environmental Technology

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The extreme characteristics of geothermal brines generate critical issues that need to be considered when selecting the material components that are in contact with them, to ensure a secure and reliable operation of the geothermal facilities.

- No scheduled outages
- Reparation/substitution of damaged elements
- Increase of operation and maintenance costs
- Reduced efficiency

Consequences:

- Increase of the CORROSION rate
- Higher mechanical degradation
- SCALING

AIMEN proposes...

Integrate and demonstrate a new MONITORING technology to decrease risk associated to corrosion damages

In-situ and on line monitoring of the corrosion and scaling degradation to follow continuously the state of the piping
Corrosion monitoring system

1. Design requirements
2. Laboratory tests
3. Manufacturing
4. Testing
5. Installation
6. Validation onsite
Corrosion monitoring system

- Multiplexer for the performance of several measurements simultaneously
- Potentiostat for EIS tests
- PC for data monitoring and probe evaluation in real time
- Control platform developed by Labview® for measurements automatization
- Internet connection for remote control and online data back-up

Numerical analysis

Nyquist plots

Corrosion rate

Probe unit cell

Measurement unit

- Control commands
- Signals
- Supervision
- 3G/LTE modem

Potentiostat

PC / control software

MUX

- WE1
- WE2
- CE1
- CE2
- RE

Corrosion rate

WE 1

WE 2

Rp = $10^5$  Unstable. Pitting events

Rp > $10^8$  Excellent protection

Rp
Corrosion monitoring system

Application

Corrosion and scaling process in different sectors.

Reliability

AIMEN probe can capture even tiny changes and it indicates corrosion of the actual pipe that is in use in real time.

Originality

In-situ and online corrosión monitoring at real time.

Innovation

High sensitivity of EIS allows it to identify changes in the material and/or coating long before any visible damage occurs.

Reduction of emissions

Contribute to an overall extension of the plant operative life and a reduction of the O&M costs linked to failures due to corrosion processes.

Improvements in energy outputs

A large portion of savings can be maximized through ensuring components perform at optimum level.
Thanks for your attention

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