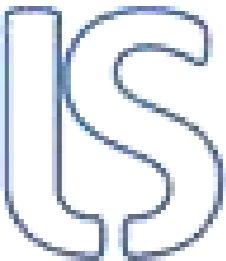
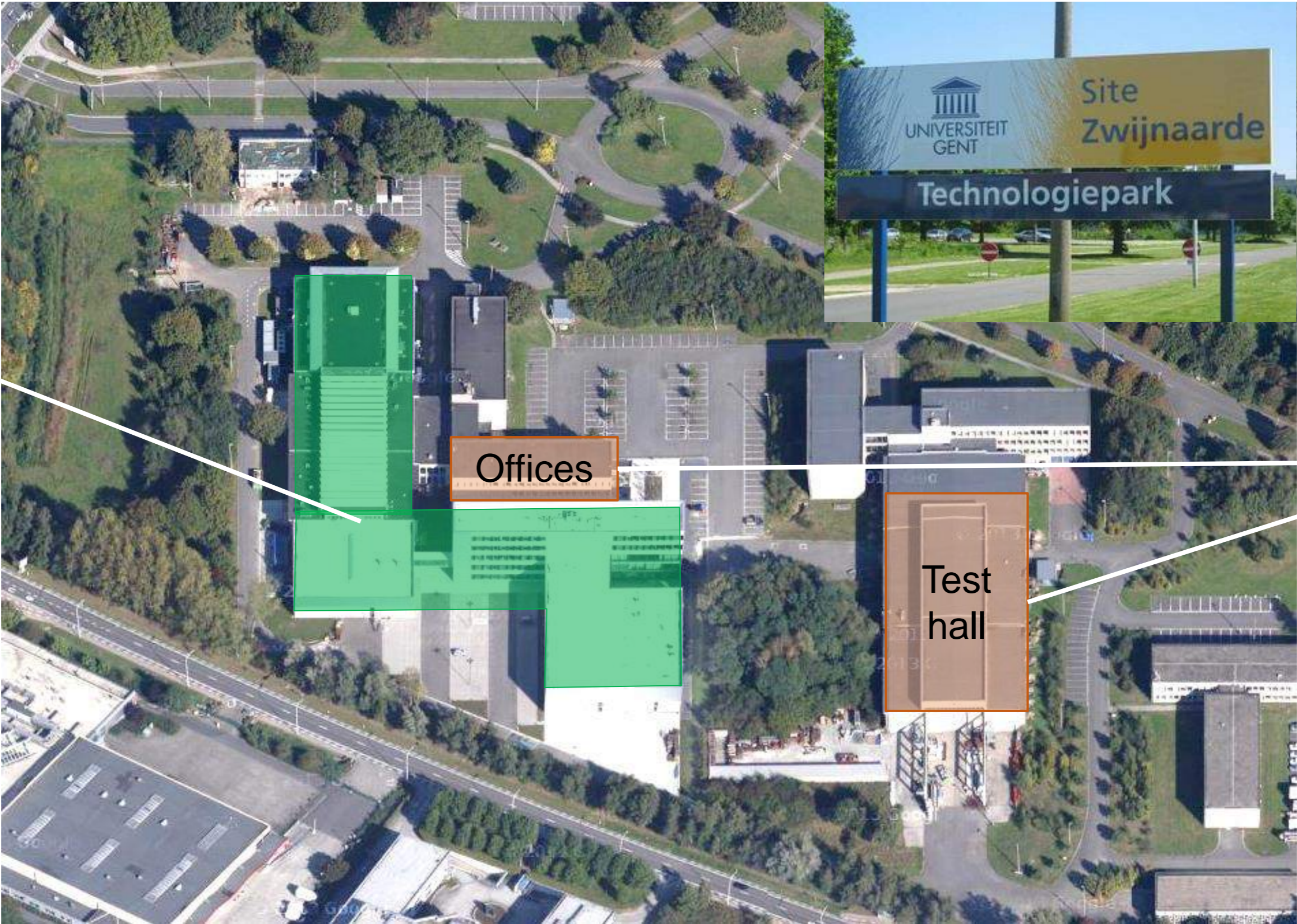


# BIG najaarsdag

## 26-09-2019

# Soete Laboratory is part of Ghent's materials research cluster



Soete Laboratory

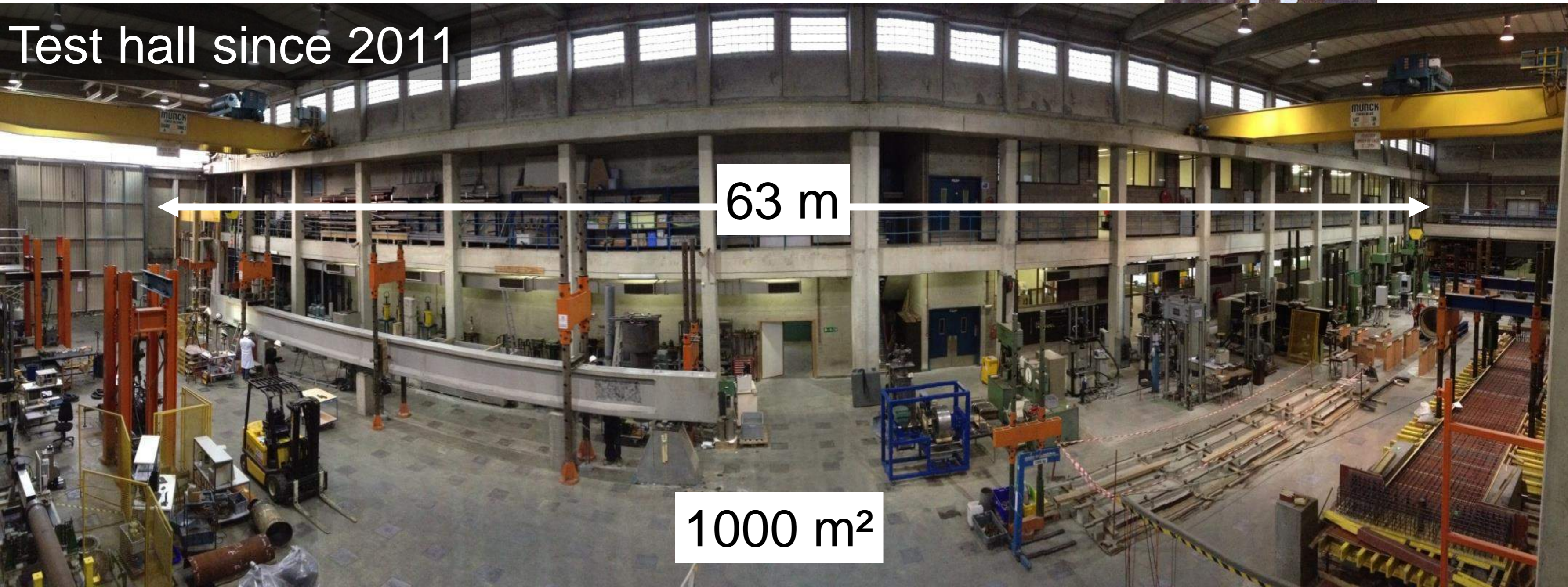
# What's in a name: Soete Laboratory

Walter Soete,  
Lab director, 1946-1982

Fracture mechanics pioneer  
Emphasis on large scale testing



Test hall since 2011



63 m

1000 m<sup>2</sup>

# Soete Laboratory in numbers

5 professors

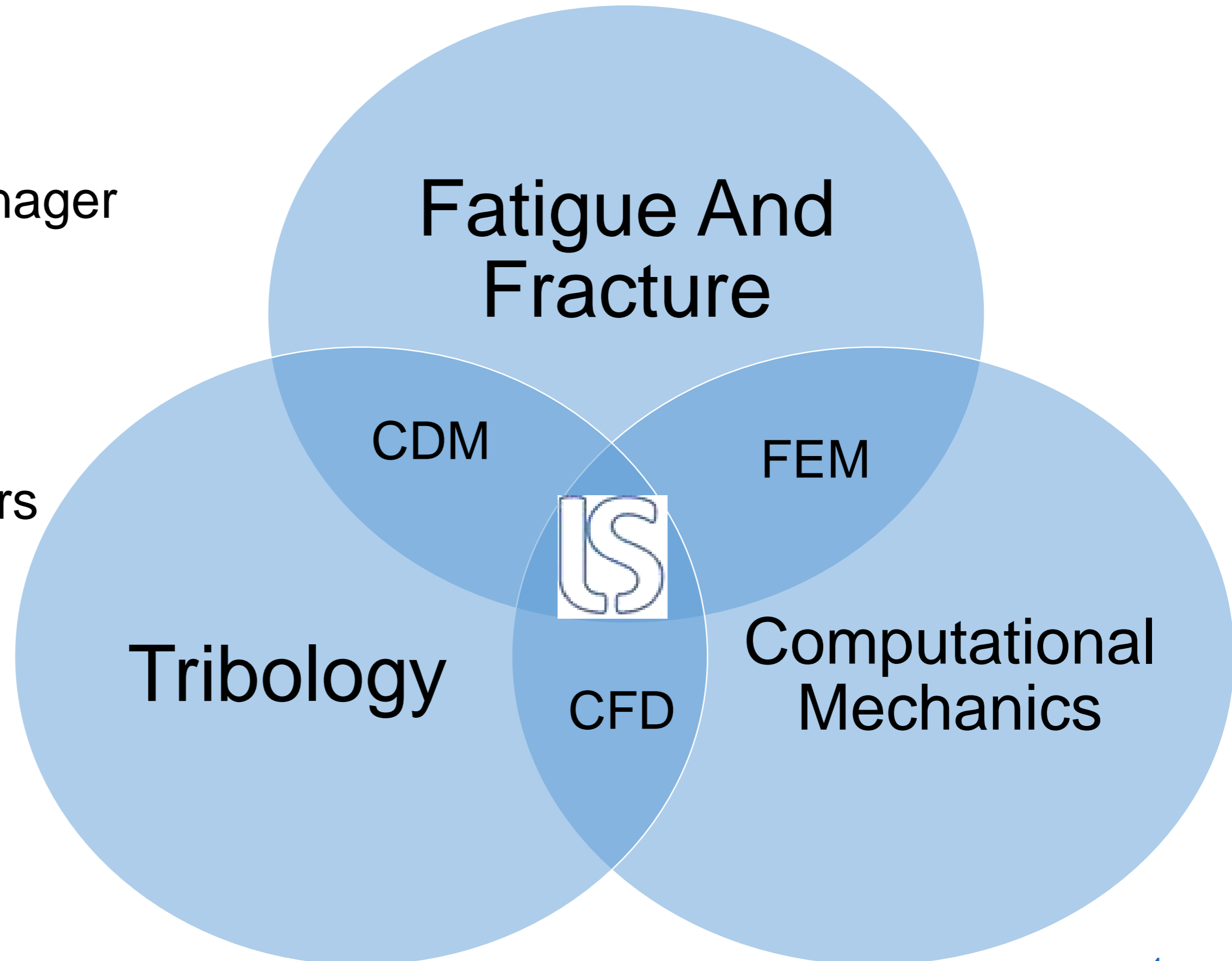
1 industrial valorisation manager

2 business developers

8 technical staff

5 post doctoral researchers

30+ pre-doctoral researchers



# Mission and Vision of Laboratory Soete

Provide customer oriented expertise and services to the industry

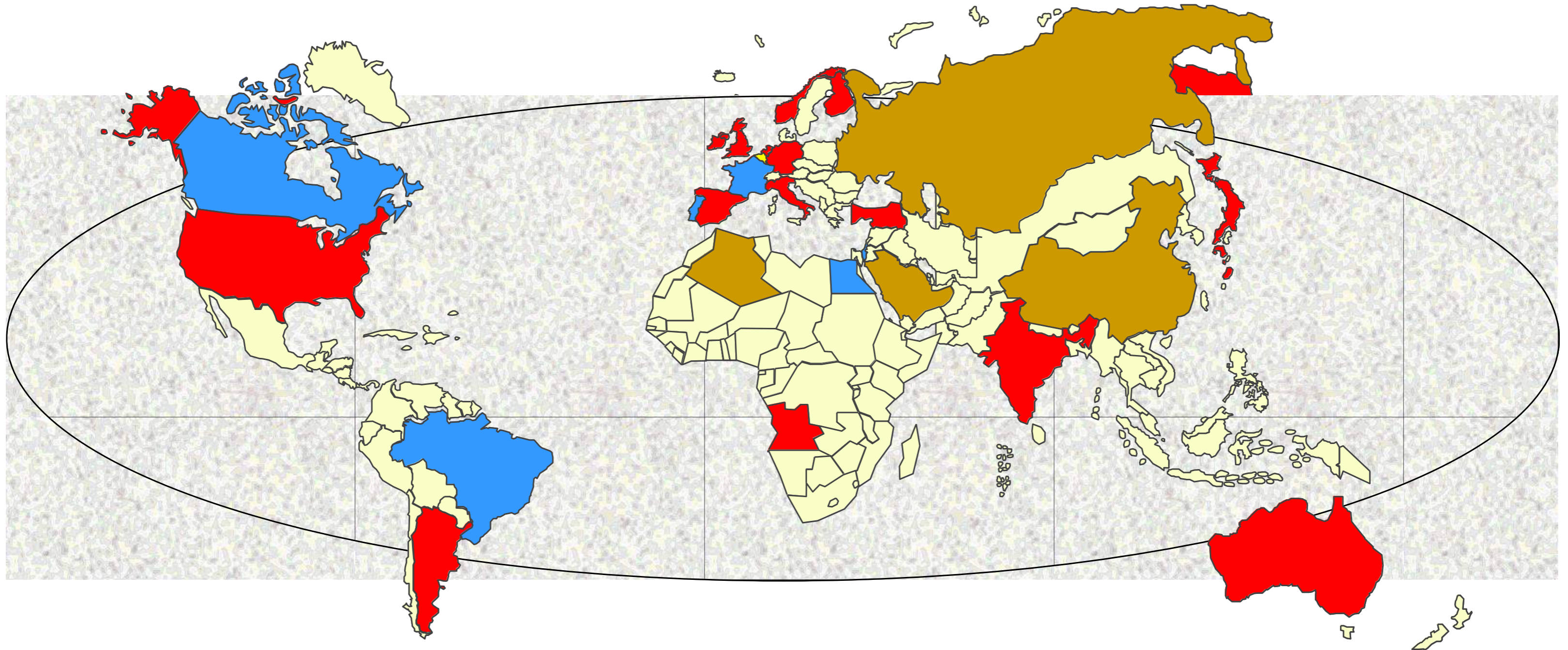
Assemble input from the industry in order to identify worldly R&D priorities

Increase the credibility of “academic” research in the eyes of the industry

Stimulate innovation: company specific R&D

**Keep It Simple (but certainly not Stupid)**

# Worldwide references: Material suppliers, contractors and end users



Why? Large test facilities and unique track record

# Major achievements

EPRG Tier 2 guidelines for girth weld defect assessment

30/40 J Charpy criterion for plastic collapse

Adopted by European, API and Australian standards

Flaw interaction criteria

Strain based design equations for plastic design

# Organisation of pipeline conferences with increasing emphasis on **lifetime extension of ageing pipelines**



1990, 1995, 2000, 2002, 2004, 2009, 2013

Pipeline Technology Conferences (Belgium, Japan)

A BETTER VIEW OF  
**PIPELINE  
TECHNOLOGY**

APC2015

The Ageing Pipelines Conference

OSTEND, BELGIUM | 5-9 OCTOBER 2015



See you next year???



# Pipelines: age $\neq$ lifetime

## Fitness for purpose

Koen Van Minnebruggen

# Lifetime of a pipe is not solely related to its age

- Risks which can reduce the safe operation of a pipeline
  - Constructional
  - Incidental
  - Age depending
- 75% of pipeline incidents irrespective of pipeline age
- Fitness for purpose assessment of 'remaining' lifetime

# San Bruno disaster (2010)

2010

54 years old  
30" gas pipeline

8 casualties  
>50 injured

age related?

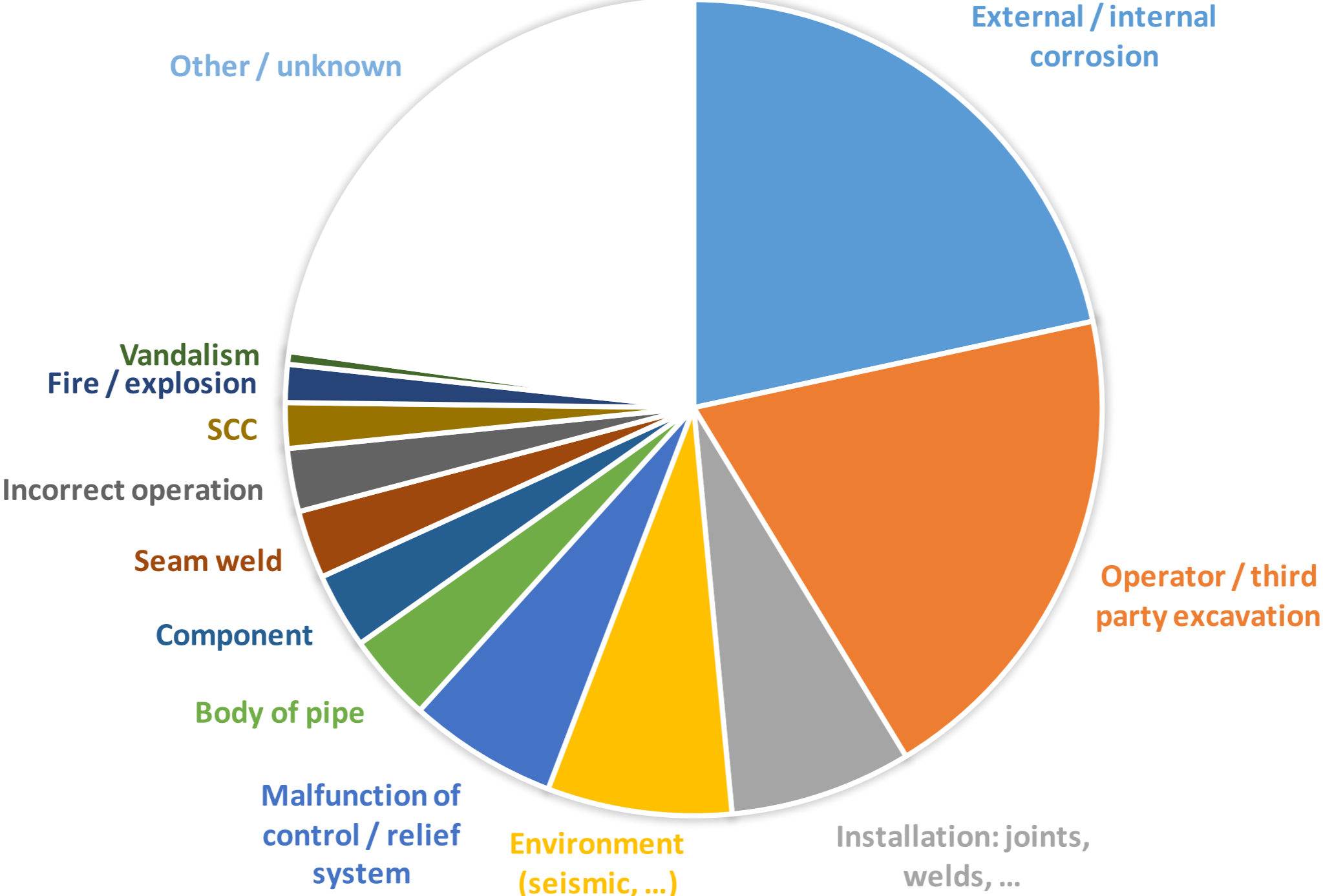
4:02 82°

**BREAKING NEWS**

**PG&E Convicted of Obstruction in San Bruno Inferno Case**

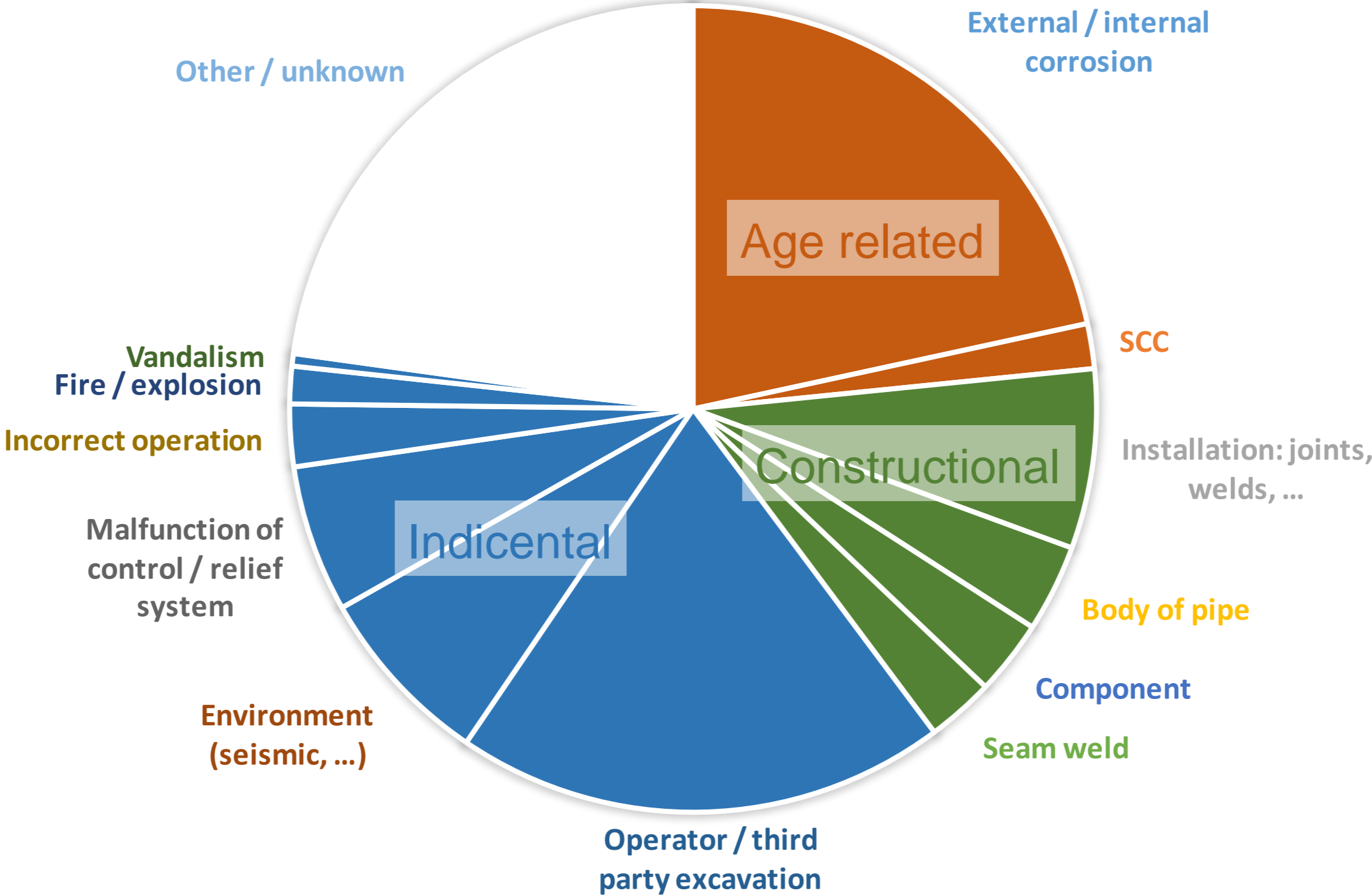
**KCAL 9**  
KCAL9.com

# Statistics of reportable incidents on pipelines



# Statistics of reportable incidents on pipelines - rearranged

How about fatigue?!



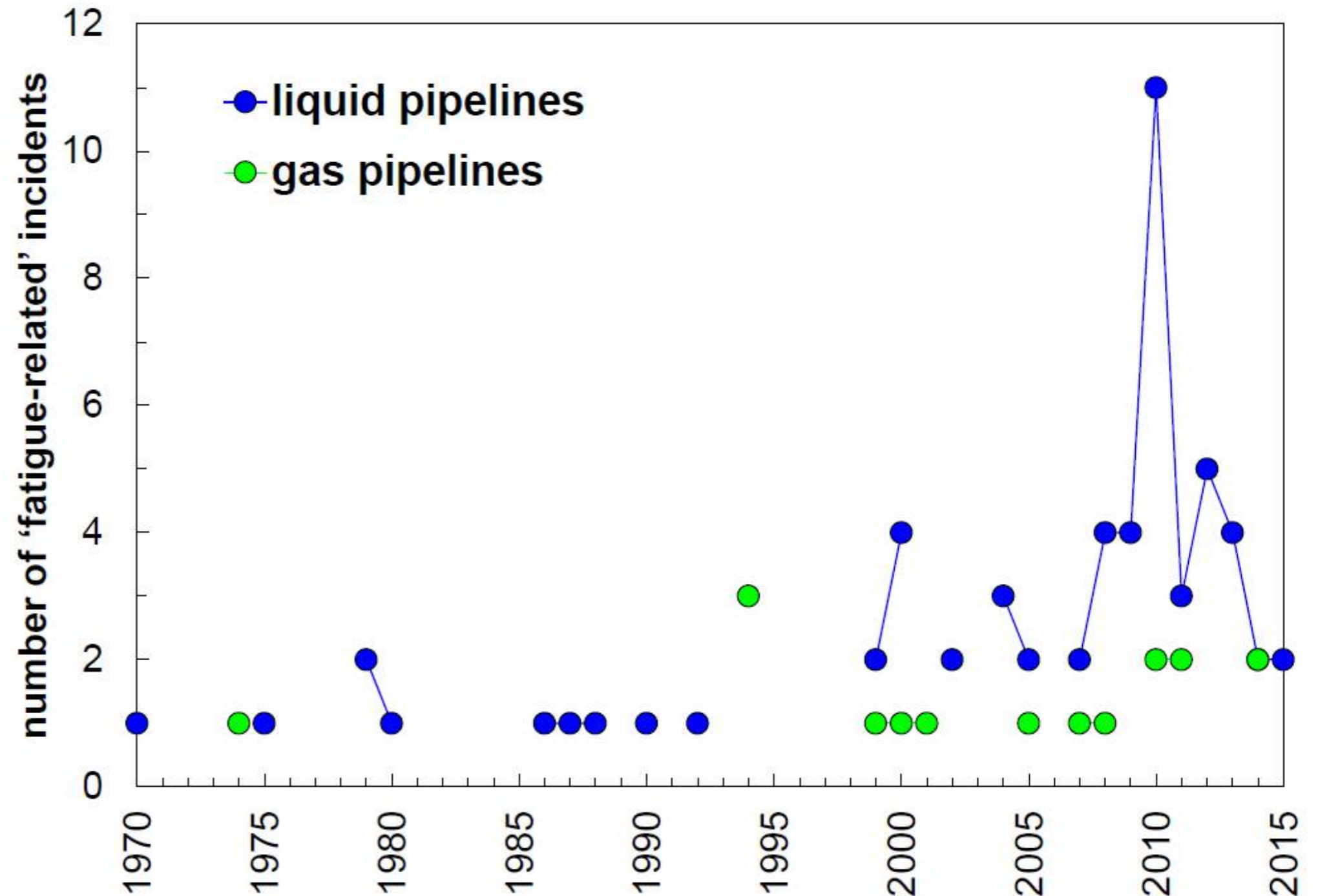
# Fatigue as a failure mode is under-documented

“Failures that can (at least partly) be attributed to fatigue are not readily identifiable in the historical data.”

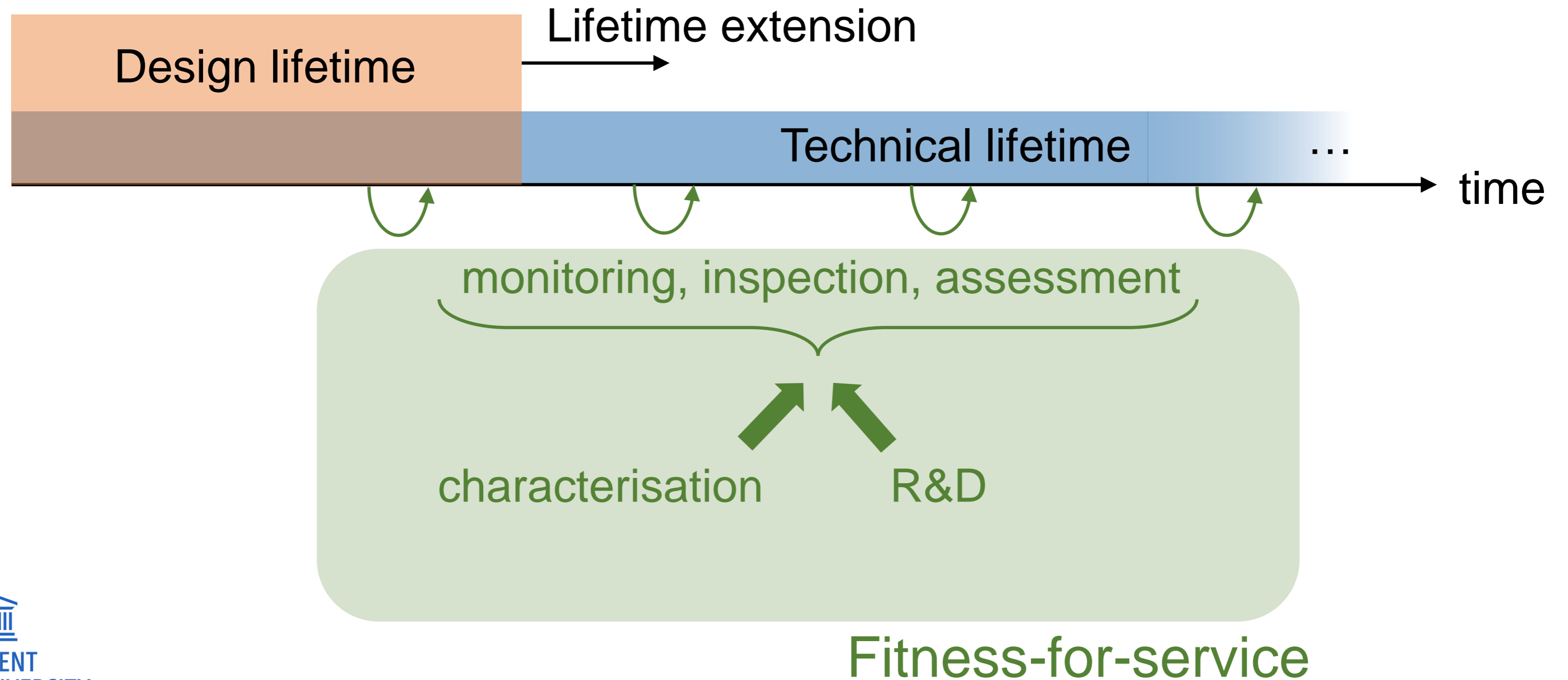
Fatigue failures do occur –  
**mostly (but not solely) in liquid pipelines**

Fatigue typically starts from an existing / newly formed defect

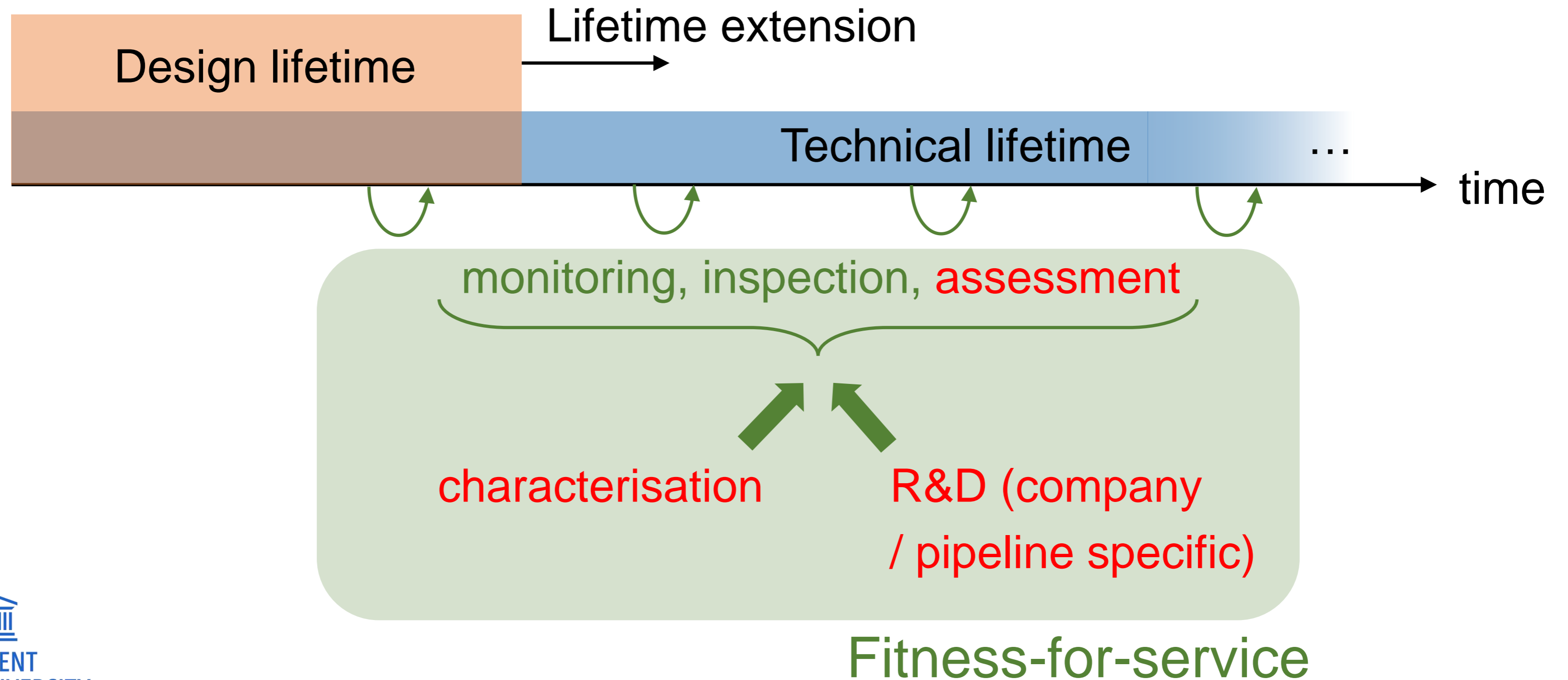
USA  
onshore hazardous liquid pipelines; onshore gas transmission and gathering pipelines



# These and other failures relate to fitness-for-service (FFS)



# These and other failures relate to fitness-for-service (FFS)





# Lab tour in two groups

Curved Wide Plate (CWP) @ 8000kN tensile test rig

Medium Wide Plate (MWP) @ 2500kN multipurpose test rig

Internal pressure (fatigue and burst)

Customized test rig design

Computational mechanics

...



# Welcome

