INFRASTAR

Innovation and Networking for Fatigue and Reliability Analysis of Structures – Training for Assessment of Risk

INFRASTAR Project

Implementation day #3

COWI – 25th June 2019

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IFSTTAR

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INFRASTAR
H2020 - MSCA - ITN - ETN

- **I**nnovation and **N**etworking for **F**atigue and **R**eliability **A**nalysis of **S**tructure – **T**raining for **A**ssessment of **R**isk
  - 4 years: 01 May 2016 - 30 April 2020
  - Budget: 3 161 113 €

- **H**orizon **2020**

European research programme started in 2014 for 7 years
Calls with open topics

- **M**arie **S**kłodowska **C**urie **A**ctions

Provide grants for all stages of researchers' careers

- **I**nnovative **T**raining **N**etworks
- **E**uropean **T**raining **N**etworks

Participants implement a joint research training programme

The ESRs
Early Stage Researchers

Joint research training programme

Develop knowledge, expertise and skill

for optimal and reliable management of structures

Fatigue of concrete

Joint research training programme

Civil infrastructures are the basis of socio-economic wealth for modern societies.

FATIGUE ↔ CONCRETE

Limitations:

#1 Concrete structures are subjected to fatigue.

- Where: bridge structures, tower/skyscraper, offshore structures, machine foundation, ...
- Relevance: Traffic increase, slender structures, offshore wind energy (foundation, grouting), reduce design and life cost

#2 Current technological means to measure fatigue are outdated, imprecise, and inappropriate.

#3 There is a lack of theoretical and practical developments of probabilistic methods.

Joint research training programme

Develop knowledge, expertise and skill

for optimal and reliable management of structures

3 major challenges

- To develop **new relevant auscultation and monitoring systems**
- To **reduce and optimize the safety margin** encountered in wind turbine and bridge design **in the assessment of remaining strength**
- To **optimize design and life cycle costs**

Fatigue of concrete

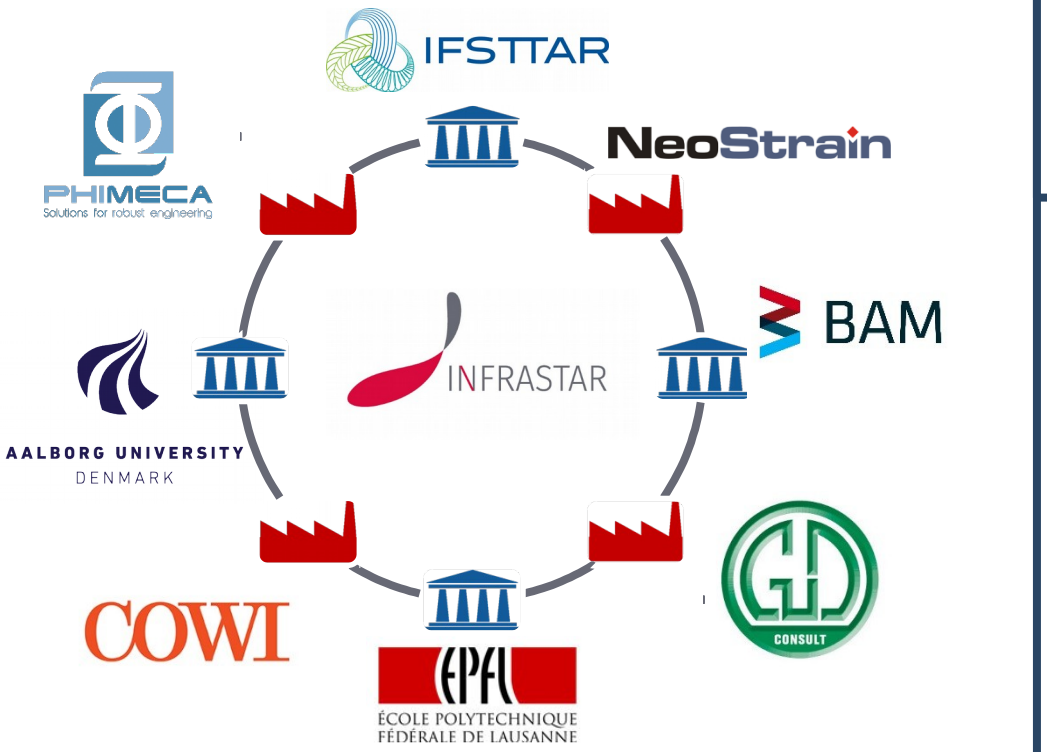
Joint research training programme

Innovation and Networking for Fatigue and Reliability Analysis of Structures – Training for Assessment of Risk



- 3 scientific Work Packages
  - WP1: Monitoring and auscultation
  - WP2: Structural and action models
  - **WP3: Reliability approaches for decision-making**
- WP4: Recruitment and training policy
- WP5: Management, dissemination, outreach and business opportunities

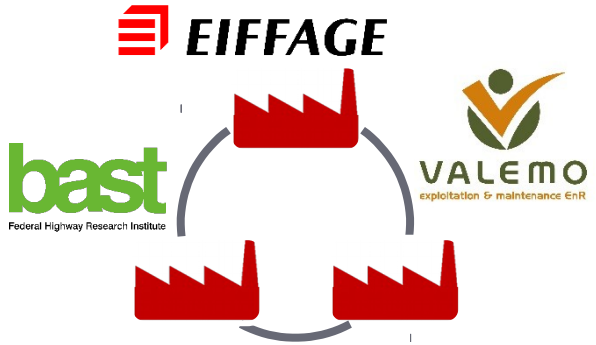
The network



8 beneficiaries

- **4 academic institutions**
- **4 industries**

3 partner organisations



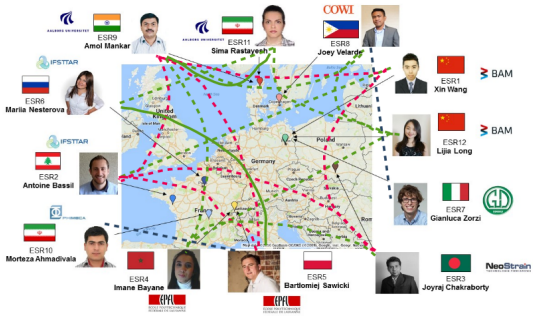
1 advisory board with 6 members

TNO innovation for life · DNV·GL · University of Surrey · Total · Politechnika Wrocławska · DB · BAM

Collaboration

For each ESR: to make a personal **contribution to knowledge**

For each of them in **Infrastar**: to benefit of a **multi-disciplinarity** breeding ground to **amplify** their contribution



→ How: the **shared objects**

On site shared objects

Millau viaduct

To promote collaboration between the Wps

To boost ESRs collaboration

To exemplify the inter-sectoral approach

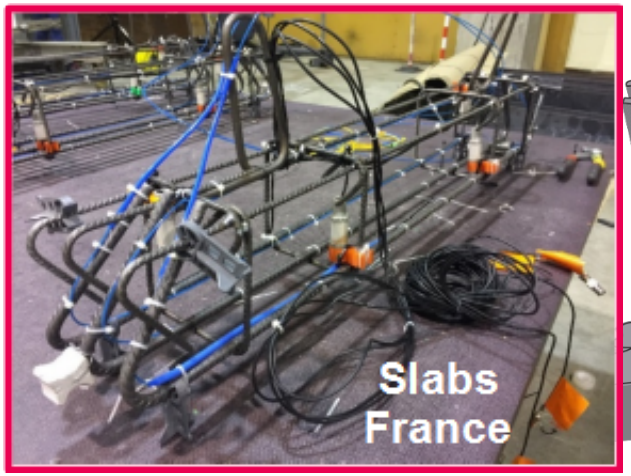
Bridge over Kłodnica river

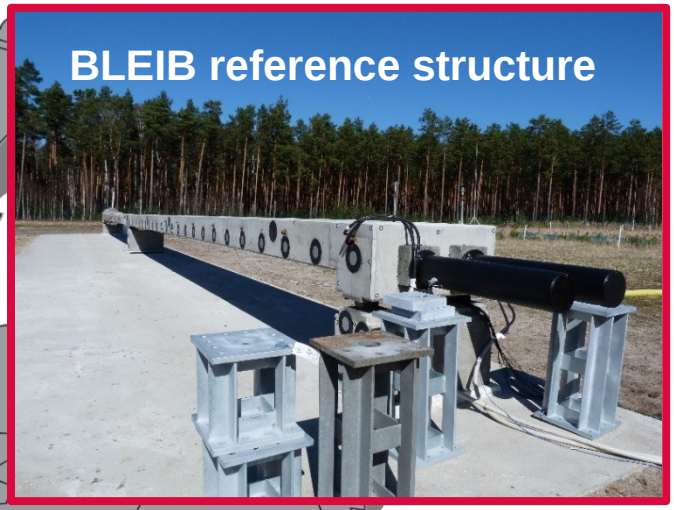
Chillon viaduct

Crêt de l'Anneau viaduct

Onshore wind turbine

Lab shared objects





Network-wide training activities

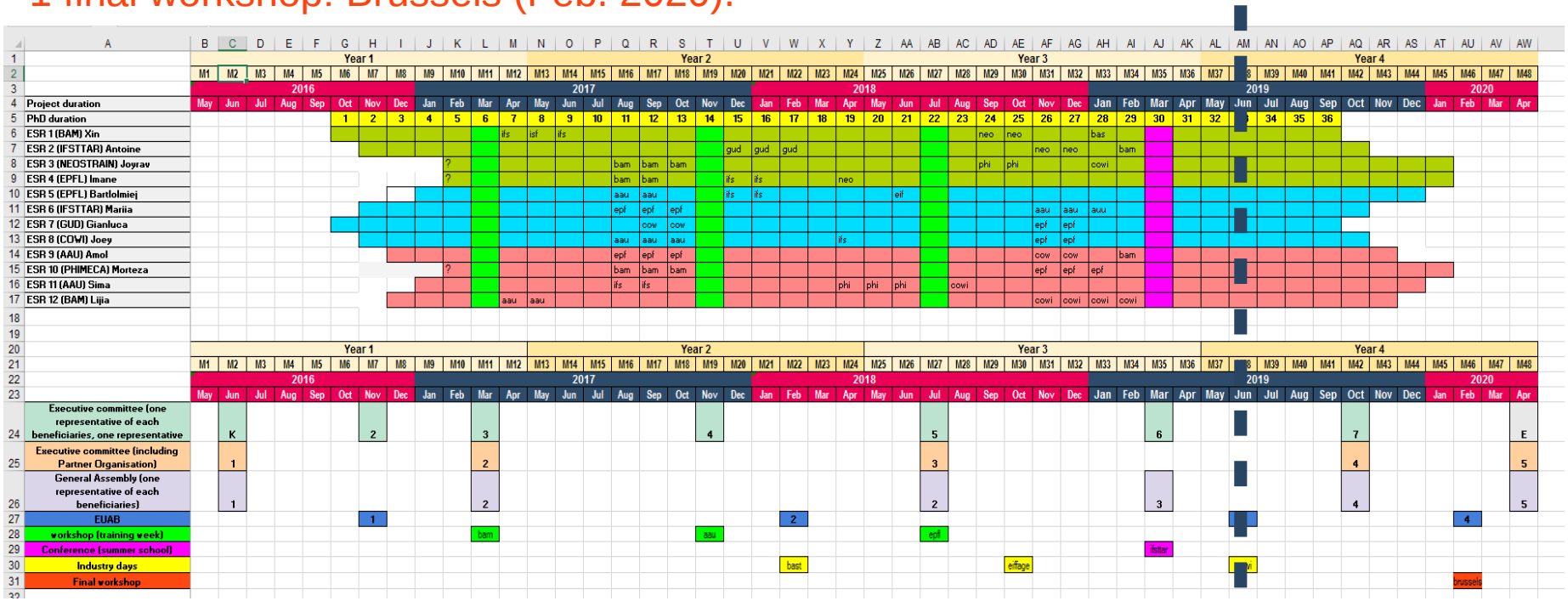
2 to 3 secondments for 2 to 3 months for each ESR.

3 training weeks: BAM (March 2017), EPFL (Nov. 2017), Aalborg (Jul. 2018).

3 implementation days: BAST (Feb. 2018), EIFFAGE (Oct. 2018), COWI (Jun. 2019).

1 winter school: IFSTTAR (Apr. 2019).

1 final workshop: Brussels (Feb. 2020).



Agenda

- 09:55 – 10:25: Challenge in the application of concrete design codes for floating wind turbine support structures
  - Simon Vasseur, Ideol, France
- 10:25 – 10:45: Structural Health Monitoring strategies for fatigue assessment of infrastructure components
  - Dr Jacob Egede Andersen, COWI, Denmark
- 10:45 – 11:05: Fatigue in grouted connections for offshore wind turbines
  - Aitor Arrospide Sanz, COWI, Denmark
- 11:05 – 11:30: Coffee break
- 11:30 – 11:40 : Focus on WP3 : Reliability approaches for decision making
  - Prof. John Dalsgaard Sorensen, AAU, Denmark
- 11:40 – 12:40 : Presentations by the Infrastar PhD students (WP3)
  - Amol Mankar (AAU), Morteza Ahmadivala (Phimeca), Sima Rastayesh (AAU), Lijia Long (AAU)
- 12:40 – 14:00: Lunch

Agenda

- 14:00 – 15:00: Poster session
  - Infrastar PhD students
- 15:00 – 15:45: Panel discussion
  - Moderator: Claus Kramhoft, COWI, Denmark
- 15:45 – 16:45: Speed networking
- 16:45 – 16:50: Conclusion
- 16:50 – 18:15: Cocktail & Networking

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Have a great implementation day

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Stay tuned **http://infrastar.eu**

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