This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 676139.

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

D5.17 – Dissemination / Exploitation plan

Document Identifier:	INFRASTAR_D5.17_Dissemination-exploitation-plan_IFSTTAR.pdf
Due Date of Delivery to EC:	2020.03.31
Actual Date of Delivery to EC:	2020.03.31
Dissemination Level:	Public
Work Package:	WP5: Management, dissemination, outreach and business opportunities
Lead Beneficiary:	IFSTTAR
Other Beneficiaries:	AAU, BAM, COWI, EPFL, GuD, NeoStrain, PHIMECA
Document Status:	Final

Hakim Ferria
Project Manager
IFSTTAR
Allée des Ponts et Chaussées, Route de Bouaye - CS4
44340 Bouguenais Cedex, France
Tel: +33 2 40 84 58 73
hakim.ferria@ifsttar.fr

Authors

Name	Company
Odile Abraham	IFSTTAR
Hakim Ferria	IFSTTAR

Amendments

Date of Issue	Description
2020.03.24	Draft version by Hakim Ferria and Odile Abraham
2020.03.24	Draft sent to the beneficiaries and ESRs for comments.
2020.03.29	Validated (no issues reported by the consortium).

Applicable documents

The documents in the table below are attached at the end of the report.

N°	Description

Acknowledgment

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 676139. The grant is gratefully acknowledged.

Table of Content

Notation

Beneficiaries

AAU	Aalborg University
BAM	Bundesanstalt für Materialforschung und –prüfung
COWI	
EPFL	École Polytechnique Fédérale de Lausanne
GuD	Geotechnik und Dynamik
IFSTTAR	Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux
NeoStrain	
PHIMECA	

Abbreviations

ESR	Early Stage Researcher
EUAB	End User Advisory Board
ImpDay	Implementation Day
INFRASTAR	Innovation and Networking for Fatigue and Reliability Analysis of Structure – Training for Assessment of Risk
ITN	Innovative Training Networks
MSCA	Marie Skłodowska-Curie Actions
WP	Work Package

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Executive Summary

The present deliverable “D5.17 – Dissemination / Exploitation plan” is part of the outcomes of H2020 MSCA ITN project Infrastar in terms of dissemination.

Whichever the scenario (construction, maintenance, rehabilitation and/or reconstruction of civil structures), the results of Infrastar project will guarantee the capacity to improve or extend the existing or future infrastructures and optimize service at any time. These outcomes are of strategic importance and must be disseminated and easily accessible to the scientific community.

First, the report introduces the terms “dissemination” and “exploitation” from the European Commission point of view. Then, it presents the Infrastar dissemination plan: scientific papers, conferences, website. Finally, it details the exploitation plan of the outcomes.

1. Introduction

The guidelines by the European Commission can be read here. The following information are extracted from the aforementioned guidelines.

Communication and dissemination are part of all MSCA ITN projects. The objectives are to communicate and disseminate the outcomes produced by projects via presentations at local, national, European and international workshops, conferences, publications in peer-reviewed journals, and outreach activities targeting the general public, students, industries, and the scientific community. From the European Commission point of view, the differences between communication and dissemination are summarised in Table 1 below (source: European Commission).

Communication	**Dissemination**
Covers the whole project (including results).	Covers project results only.
Starts at the outset of the project.	Happens only when results are available.
Multiple audiences: Beyond the project's own community, including the media and general public. Multiplier effect.	Specialist audiences: Group that may use the results in their own work, including peer groups, industry, professional organisations, policymakers.
Informing and engaging with society, to show how it can benefit from research.	Enabling the take-up and use of results.

Table 1: Differences between communication and dissemination.

The present report focusses on the dissemination part as well as the exploitation of the results. Dissemination means sharing research results with potential users (peers in the research field, industry, other commercial players and policymakers). By sharing research results with the rest of the scientific community, projects contribute to the progress of science in general. Whereas exploitation is the use of results for commercial purposes or in public policymaking.

2. Scientific papers

The outcomes of Infrastar have been disseminated and published through peer-reviewed papers. There are reported in the following deliverables:

- "D1.2 – Peer-reviewed papers" by WP1: Monitoring and auscultation.
- "D2.2 – Peer-reviewed papers" by WP2: Structural and action models.
- "D3.2 – Peer-reviewed papers" by WP3: Reliability approaches for decision-making.

The full list of publications is presented below. The journal papers are first listed, then the conference papers, and finally posters. All are classified by year and listed in alphabetic order based on the first author's family name. The list is also available on the Infrastar website (https://infrastar.eu/communication-dissemination/publications/).

Note that there are papers to be submitted that are not listed below.

2.1 Journal papers

2020

- Long L., Döhler M., Thöns S.
  Determination of structural and damage detection system influencing parameters on the value of information
  Structural Health Monitoring Journal, January 2020
- Long L., Mai A. Quang., Morato G. P., Sørensen D. J., Thöns S.

On the conditional value of structural and environmental information for offshore wind turbines
Submitted to Renewable Energy Journal.

- Long L., Alcover F. I., Thöns S.
  Utility-based decision of optimal SHM campaign and service life extension on an orthotropic steel bridge deck
  Submitted to Structure & Infrastructure Engineering journal.
- Sawicki B., Brühwiler E.
  Long-term strain measurements of traffic and temperature effects on an RC bridge deck slab strengthened with an R-UHPFRC layer
  Journal of Civil Structural Health Monitoring, March 2020
- Rastayesh S., Mankar A., Sørensen J.D., Bahrebar S.
  Development of Stochastic Fatigue Model of Reinforcement for Reliability of Concrete Structures
  Applied Sciences, 2020, Volume 10, Issue 2, 604
- Velarde, J., Kramhøft, C., Sørensen, J. D., & Zorzi G.
  Fatigue reliability of large monopiles for offshore wind turbines
  International Journal of Fatigue, Volume 134, 2020

2019

- Bassil A., Wang X., Chapeleau X., Niederleithinger E., Abraham O., Leduc D.
  Distributed Fiber Optics Sensing and Coda Wave Interferometry Techniques for Damage Monitoring in Concrete Structures
  Sensors, Volume 19, Issue 2, January 2019
- Bayane I., Mankar A., Brühwiler E., Sørensen J.D.
  Quantification of traffic and temperature effects on the fatigue safety of a reinforced-concrete bridge deck based on monitoring data
  Engineering Structures, Volume 196, October 2019
- Chakraborty J., Katunin A., Klikowicz P., Salamak M.
  Early crack detection of reinforced concrete structure using embedded sensors
  Sensors, Volume 19, Issue 18, 2019
- Chakraborty J., Katunin A.
  Detection of structural changes in concrete using embedded ultrasonic sensors based on autoregressive model
  Diagnostyka, Vol.20, No. 1, 2019
- Mankar A., Bayane I., Sørensen J.D., Brühwiler E.
  Probabilistic reliability framework for assessment of concrete fatigue of existing RC bridge deck slabs using data from monitoring
  Engineering Structures Journal, Volume 201, December 2019
- Nesterova M., Schmidt F., Soize C.
  Probabilistic analysis of the effect of the combination of traffic and wind actions on a cable-stayed bridge
  Bridge Structures, Volume 15, No 3, pp. 121-138, November 2019
- Rastayesh S., Bahrebar S., Blaabjerg F., Zhou D., Wang H., Sørensen J.D.
  A System Engineering Approach Using FMEA and Bayesian Network for Risk Analysis - A Case Study
  Sustainability, Volume 12, Issue 1, 77
- Rastayesh S., Bahrebar S., Bahman A.S., Sørensen J.D., Blaabjerg F.
  Lifetime Estimation and Failure Risk Analysis in a Power Stage Used in Wind-Fuel Cell Hybrid Energy Systems
  Electronics, Volume 8, Issue 12, November 2019
- Rastayesh S., Long L., Sørensen J.D., Thöns S.
  Risk Assessment and Value of Action Analysis for Icing Conditions of Wind Turbines Close to Highways
  Energies, Volume 12, Issue 14, 2019

- Velarde J., Vanem V., Kramhøft C., Sørensen J.D.
  Probabilistic analysis of offshore wind turbines under extreme resonant response: application of environmental contour method
  Applied Ocean Research, Volume 93, December 2019
- Velarde J., Mankar A., Kramhøft C., Sørensen J.D.
  Uncertainty Modeling and Fatigue Reliability Assessment of Offshore Wind Turbine Concrete Structures
  International Journal of Offshore and Polar Engineering (IJOPE), Volume 29, Issue 2 (June 2019), pp.165-171
- Velarde J., Kramhøft C., Sørensen J.D.
  Global sensitivity analysis of offshore wind turbine foundation fatigue loads
  Renewable Energy, Volume 140, March 2019, Pages 177-189
- Zorzi G., Gabrieli F., Le H.V., Rackwitz F., Kirsch F.
  DEM modelling of high cyclic loading: calibration, sensitivity analysis and practical application
  Submitted to Journal Acta Geotechnica

2018

- Nesterova M., Schmidt F., Soize C.
  Extreme Values analysis for the combination of traffic and environmental actions on cable-state bridges with orthotropic deck
  Bridge Structures Journal
- Niederleithinger E., Wang X., Herbrand M., Müller M.
  Processing ultrasonic data by coda wave interferometry to monitor load tests of concrete beams
  Sensors, Volume 18, Issue 6 (June 2018)
  The authors made the following corrections to this paper. View full-text.
  Sensors, Volume 19, Issue 1 (January 2019)
- Thöns S., Döhler M., Long L.
  On Damage Detection System Information for Structural Systems
  Structural Engineering International, Volume 28, Issue 3, pages 255-268, 2018

2.2 Conference papers

2019

- Ahmadivala M., Mattrand C., Gayton N., Dumas A., Yalamas T., Orcesi A.
  Application of AK-SYS method for time-dependent reliability analysis
  CFM 2019, 24e Congrès Français de Mécanique, Brest, France, 26-30 August 2019
- Ahmadivala M. Sawicki B., Brühwiler E., Yalamas T., Gayton N., Mattrand C., Orcesi A.
  Application of Time Series Methods on Long-Term Structural Monitoring Data for Fatigue Analysis
  SMAR 2019 - 5th Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures, Postdam, Germany, 27-29 August 2019
- Ahmadivala M., Mattrand C., Gayton N., Yalamas T., Orcesi A., Causse G.
  Time-variant Reliability Analysis Based on AK-SYS
  ICASP13, The 13th International Conference on Applications of Statistics and Probability in Civil Engineering, Seoul, South Korea, 26-30 May 2019
- Bassil A., Niederleithinger E., Wang X., Kadoke D., Chapeleau X., Leduc D., Abraham O., Breithaupt M., Pötschke S.
  Distributed Fiber Optic Sensors for multiple crack monitoring in reinforced concrete structures
  IWSHM 2019, The 12th International Workshop on Structural Health Monitoring, Stanford, California, USA, 10-12 September 2019
- Bayane I., Brühwiler E.

Acoustic emission and ultrasonic testing for fatigue damage detection in a RC bridge deck slab
SMAR 2019 - 5th Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures, Postdam, Germany, 27-29 August 2019

- Bayane I., Long L., Thöns S., Brühwiler E.
  Quantification of the conditional value of SHM data for the fatigue safety evaluation of a road viaduct
  ICASP13, The 13th International Conference on Applications of Statistics and Probability in Civil Engineering, Seoul, South Korea, 26-30 May 2019
- Chakraborty J., Katunin A., Klikowicz P., Salamak M.
  Embedded ultrasonic transmission sensors and signal processing techniques for structural change detection in the Gliwice bridge
  ICSI, 3rd International Conference on Structural Integrity, Funchal, Madeira, Portugal, 2-5 September 2019
- Chakraborty J., Stolinski M., Katunin A.
  Addressing the detection capability for scalable energy consumption using primary data acquisition system of embedded ultrasonic sensors in SHM
  ICAEE, Proceedings of the 2019 5th International Conference on Advances in Electrical Engineering,Dhaka, Bangladesh, 26-28 September
- Long L., Mai A.Q., Thöns S., Sørensen J.D.
  On the value of SHM information for the offshore wind turbines
  WESC 2019 - Wind Energy Science Conference,Cork, Ireland, 17-20 June 2019
- Long L., Farreras Alcover I., Thöns S.
  Quantification of the posterior utilities of SHM campaigns on an orthotropic steel bridge deck
  IWSHM 2019, The 12th International Workshop on Structural Health Monitoring, Stanford, California, USA, 10-12 September 2019
- Mankar A., Sørensen J.D.
  Probabilistic fatigue design of reinforced-concrete wind turbine foundations
  ICASP13, The 13th International Conference on Applications of Statistics and Probability in Civil Engineering, Seoul, South Korea, 26-30 May 2019
- Mankar A., Sørensen J.D., Velarde J., Kramhøft C.
  Optimization of pre-stressing in gravity based foundation of an offshore wind turbine using reliability framework
  WESC, Wind Energy Science Conference, Cork, Ireland, 17-20 June 2019
- Nesterova M., Schmidt F., Soize C.
  Estimation of remaining life of a bridge with an orthotropic deck exposed to extreme traffic and wind actions
  IWSHM 2019, The 12th International Workshop on Structural Health Monitoring, Stanford, California, USA, 10-12 September 2019
- Nesterova M., Nowak M., Schmidt F., Fischer O.
  Reliability of a bridge with an orthotropic deck exposed to extreme traffic events
  MMR, The 11th International Conference on Mathematical Methods in Reliability, Hong-Kong, 3-7 June 2019
- Rastayesh S., Zorzi G., Miraglia S., Sørensen J.D.
  Risk assessment of adverse events for wind turbines caused by strong winds
  WESC, Wind Energy Science Conference, Cork, Ireland, 17-20 June 2019
- Sawicki B., Brühwiler E.
  Long term monitoring of a UHPFRC-strengthened bridge deck slab using strain gauges
  SMAR 2019 - 5th Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures, Postdam, Germany, 27-29 August 2019
- Sawicki B., Brühwiler E.
  Static behavior of reinforced UHPFRC beams with minimal cover thickness
  2IIS-UHPC - The 2nd International Interactive Symposium on Ultra-High Performance Concrete, Albany, New York, USA, 2-5 June 2019

- Sørensen J.D., Mankar A.
  Probabilistic design of wind turbine concrete components subject to fatigue
  SMSS 2019 - International Conference on Sustainable Materials, Systems and Structures, Rovinj, Croatia, 20-22 March 2019
- Velarde J., Kramhøft C., Sørensen J.D.
  Reliability-based Design Optimization of Offshore Wind Turbine Concrete Structures
  ICASP13, The 13th International Conference on Applications of Statistics and Probability in Civil Engineering, Seoul, South Korea, 26-30 May 2019
- Velarde J., Vanem E., Kramhøft C., Sørensen J.D.
  Development of fatigue resonance limit state for offshore wind turbine support structures
  WESC, Wind Energy Science Conference, Cork, Ireland, 17-20 June 2019
- Wang X., Chakraborty J., Klikowicz P., Niederleithinger E.
  Monitoring a concrete bridge girder with the coda wave interferometry method
  SMAR 2019 - 5th Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures, Postdam, Germany, 27-29 August 2019
- Wang X., Niederleithinger E., Lange M., Stolpe H.
  Implementation of ultrasonic Coda Wave Interferometry on a real bridge
  IWSHM 2019 - The 12th International Workshop on Structural Health Monitoring, Stanford, California, USA, 10-12 September 2019
- Zorzi G., Velarde J., Mankar A.
  Reliability analysis of offshore wind turbine foundations under lateral cyclic loading
  WESC, Wind Energy Science Conference, Cork, Ireland, 17-20 June 2019
- Zorzi G., Kirsch F., Richter T., Østergaard M.U., Sørensen S.P.H.
  Validation of explicit method to predict accumulation of strain during single and multistage cyclic loading
  ECSMGE 2019 - The XVII European Conference on Soil Mechanics and Geotechnical Engineering, Reykjavik Iceland, 1-6 September 2019

2018

- Abraham O., Niederleithinger E., Chapeleau X., Klikowicz P., Brühwiler E., Bassil A., Wang X., Chakraborty J., Bayane I., Leduc D., Salamak M., Katunin A., Sørensen J.D.
  Addressing the need to monitor concrete fatigue with Non Destructive Testing: preliminary results of Infrastar European project
  SMT and NDT-CE 2018 - Structural Materials Technology for Highways and Bridges (SMT) and the International Symposium on Non-Destructive Testing in Civil Engineering (NDT-CE), New Brunswick, New Jersey, USA, 27-29 August 2018
- Bassil A., Chapeleau X., Leduc D., Abraham O.
  Quantification of cracks in reinforced concrete structures using distributed fibre optic sensors
  EWSHM 2018, The 9th European Workshop on Structural Health Monitoring Series, Manchester, UK, 10-13 July 2018
- Bayane I., Brühwiler E.
  "Pocket-Monitoring" for fatigue safety verification of a RC bridge deck slab
  IALCCE 2018, The Sixth International Symposium on Life-Cycle Civil Engineering, Ghent, Belgium, 28-31 October 2018
- Clark C., Velarde J., Nielsen J.S.
  Fatigue load reductions in offshore wind turbine monopile foundations in co-located wind-wave arrays
  Proceedings of the ASME 2018, IOWT2018, 1st International Offshore Wind Technical Conference, San Francisco, USA, 4-7 November 2018
- Long L., Thöns S., Döhler M.
  The effects of deterioration models on the value of damage detection information
  IALCCE 2018, The Sixth International Symposium on Life-Cycle Civil Engineering, Ghent, Belgium, 28-31 October 2018
- Long L., Thöns S., Döhler M.

The effects of SHM system parameters on the value of damage detection information
EWSHM 2018, The 9th European Workshop on Structural Health Monitoring Series, Manchester, UK, 10-13 July 2018

- Mankar A., Rastayesh S., Sørensen J.D.
  Fatigue reliability analysis of Cret De l'Anneau viaduct: A case study
  IALCCE 2018, The Sixth International Symposium on Life-Cycle Civil Engineering, Ghent, Belgium, 28-31 October 2018
- Mankar A., Sørensen J.D.
  Fatigue reliability analysis of onshore wind turbine foundations
  14th EAWE PhD Seminar on Wind Energy, Vrije Universiteit Brussel, Belgium, 18-20 September 2018
- Mankar A., Rastayesh S., Sørensen J.D.
  Sensitivity and identifiability study for uncertainty analysis of material model for concrete fatigue
  IRSEC 2018, 5th International Reliability and Safety Engineering Conference, Shiraz University, Iran, 9-10 May 2018
- Nesterova M., Schmidt F., Brühwiler E., Soize C.
  Generalized Pareto Distribution for reliability of bridges exposed to fatigue
  IABMAS 2018, 9th International Conference on Bridge Maintenance, Safety and Management, Melbourne, Australia, 9-13 July 2018
- Niederleithinger E., Wang X.
  Concepts from seismic interferometry transferred to sonic and ultrasonic concrete inspection and monitoring
  ECNDT 2018, The 12th European Conference on Non-Destructive Testing, 11-15 June 2018, Gothenburg, Sweden
- Rastayesh S., Sørensen J.D.
  Risk analysis for wind turbines near highways
  The 4th SRA Nordic Conference, Stavanger, Norway 8–9 November 2018
- Rastayesh S., Nielsen J.S., Sørensen J.D.
  Bayesian network methods for risk-based decision making for wind turbines
  14th EAWE PhD Seminar on Wind Energy, Vrije Universiteit Brussel, Belgium, 18-20 September 2018
- Rastayesh S., Mankar A., Sørensen J.D.
  Comparative investigation of uncertainty analysis with different methodologies on fatigue data of rebars
  IRSEC 2018, 5th International Reliability and Safety Engineering Conference, Shiraz University, Iran, 9-10 May 2018
- Sawicki B., Brühwiler E., Nesterova M.
  Fatigue safety verification of a steel railway bridge using short term monitoring data
  IALCCE 2018, The Sixth International Symposium on Life-Cycle Civil Engineering, Ghent, Belgium, 28-31 October 2018
- Velarde J., Kramhøft C., Sørensen J.D.
  Global sensitivity analysis of offshore wind turbine foundation fatigue loads
  14th EAWE PhD Seminar on Wind Energy, Vrije Universiteit Brussel, Belgium, 18-20 September 2018
- Velarde J., Kramhøft C., Sørensen J.D.
  Uncertainty Modeling and Fatigue Reliability Assessment of Concrete Gravity Based Foundation for Offshore Wind Turbines
  ISOPE 2018, The 28th International Society of Offshore and Polar Engineers Conference, Sapporo, Japan, 10-15 June 2018
- Wang X., Niederleithinger E.
  Coda wave interferometry used to detect loads and cracks in a concrete structure under field conditions
  EWSHM 2018, The 9th European Workshop on Structural Health Monitoring Series, Manchester, UK, 10-13 July 2018

- Zorzi G., Kirsch F., Richter T.
  Lifetime tilting prediction of offshore wind turbine foundations due to soil strain accumulation
  14th EAWE PhD Seminar on Wind Energy, Vrije Universiteit Brussel, Belgium, 18-20 September 2018
- Zorzi G., Richter T., Kirsch F., Augustesen A.H., Østergaard M.U., Sørensen S.P.H.
  Explicit method to account for cyclic degradation of offshore wind turbine foundations using cyclic interaction diagrams
  ISOPE 2018, The 28th International Society of Offshore and Polar Engineers Conference, Sapporo, Japan, 10-15 June 2018

2017

- Long L., Thöns S., Döhler M.
  Damage detection and deteriorating structural systems
  IWSHM 2017, The 11th International Workshop on Structural Health Monitoring, Stanford, California, USA, 12-14 September 2017
- Nesterova M., Schmidt F., Soize C., Siegert D.
  Extreme effects on bridges caused by traffic and wind
  CFM 2017, Congrès Français de Mécanique 2017, Lille, France, 28 August - 01 September 2017
- Zorzi G., Kirsch F., Gabrieli F., Rackwitz F.
  Long-term cyclic triaxial tests with DEM simulations
  PARTICLES 2017, V International Conference on Particle-based Methods – Fundamentals and Applications, Hannover, Germany, 26-28 September 2017

2.3 Poster

2018

- Chakraborty J., Katunin A.
  Autoregressive model-based changes detection in concrete structures using ultrasonic sensors
  TSD, 17th International Technical Systems Degradation Conference, Liptovský Mikuláš, Slovakia, 4-7 April 2018

2017

- Zorzi G.
  From Micro to Macro: a validation of a multiscale coupling FEM-DEM
  T-MAPPP Workshop in conjunction with the 5th International Conference on Particle-based Methods – Fundamentals and Applications (PARTICLES 2017), Hannover, Germany, 26-28 September 2017

3. Conferences

Infrastar outcomes have been presented in national and international conferences, listed in Table 2 below.

Participation in the following conferences are scheduled for 2020 (subject to changes due to the covid-19 outbreak):

- BEI International Symposium on UHPC and Emerging Concrete (BEI-UHPC): Development and Applications in Singapore, 22-25 June 2020.
- The 10th International Conference on Bridge Maintenance, Safety and Management (IABMAS) in Sapporo, Japan, 28 June-02 July.

Conference	Participant
CFM 2017, Congrès Français de Mécanique 2017, Lille, France, 28 August - 01 September 2017	ESR6
IWSHM 2017, The 11th International Workshop on Structural Health Monitoring, Stanford, California, USA, 12-14 September 2017	ESR12 supervisor
T-MAPPP Workshop in conjunction with the 5th International Conference on Particle-based Methods – Fundamentals and Applications (PARTICLES 2017), Hannover, Germany, 26-28 September 2017	ESR7
TSD, 17th International Technical Systems Degradation Conference, Liptovský Mikuláš, Slovakia, 4-7 April 2018	ESR3
IRSEC 2018, 5th International Reliability and Safety Engineering Conference, Shiraz University, Iran, 9-10 May 2018	ESR9, ESR11
ISOPE 2018, The 28th International Society of Offshore and Polar Engineers Conference, Sapporo, Japan, 10-15 June 2018	ESR7, ESR8
IABMAS 2018, 9th International Conference on Bridge Maintenance, Safety and Management, Melbourne, Australia, 9-13 July 2018	ESR6
EWSHM 2018, The 9th European Workshop on Structural Health Monitoring Series, Manchester, UK, 10-13 July 2018	ESR1, ESR2, ESR12
ECNDT 2018, The 12th European Conference on Non-Destructive Testing, Gothenburg, Sweden, 11-15 June 2018	ESR1
SMT and NDT-CE 2018 - Structural Materials Technology for Highways and Bridges and the International Symposium on Non-Destructive Testing in Civil Engineering, New Brunswick, New Jersey, USA, 27-29 August 2018	Project coordinator
14th EAWE PhD Seminar on Wind Energy, Vrije Universiteit Brussel, Belgium, 18-20 September 2018	ESR7, ESR8, ESR9, ESR11
IALCCE 2018, The Sixth International Symposium on Life-Cycle Civil Engineering, Ghent, Belgium, 28-31 October 2018	ESR4, ESR5, ESR9, ESR11, ESR12
The 4th SRA Nordic Conference, Stavanger, Norway 8–9 November 2018	ESR11
SMSS 2019 - International Conference on Sustainable Materials, Systems and Structures, Rovinj, Croatia, 20-22 March 2019	WP3 leader
ICASP13, The 13th International Conference on Applications of Statistics and Probability in Civil Engineering, Seoul, South Korea, 26-30 May 2019	ESR4, ESR8, ESR9, ESR10
2IIS-UHPC - The 2nd International Interactive Symposium on Ultra-High Performance Concrete, Albany, New York, USA, 2-5 June 2019	ESR5
MMR, The 11th International Conference on Mathematical Methods in Reliability, Hong-Kong, 3-7 June 2019	ESR6
WESC, Wind Energy Science Conference, Cork, Ireland, 17-20 June 2019 With a mini symposium dedicated to Infrastar chaired by WP3 leader (https://www.wesc2019.org/theme-6-mini-symposia).	WP3 leader, ESR7, ESR8, ESR9, ESR11, ESR12
CFM 2019, 24e Congrès Français de Mécanique, Brest, France, 26-30 August 2019	ESR10
SMAR 2019 - 5th Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures, Postdam, Germany, 27-29 August 2019	WP1 leader, ESR4, ESR5, ESR10
ECSMGE 2019 - The XVII European Conference on Soil Mechanics and Geotechnical Engineering, Reykjavik Iceland, 1-6 September 2019	ESR7
ICSI, 3rd International Conference on Structural Integrity, Funchal, Madeira, Portugal, 2-5 September 2019	ESR3
IWSHM 2019 - The 12th International Workshop on Structural Health Monitoring, Stanford, California, USA, 10-12 September 2019	Project coordinator, ESR2 supervisor, ESR1, ESR2, ESR6, ESR12

Table 2: Participation in conferences.

4. Other dissemination materials

4.1 Infrastar website

The Infrastar website https://infrastar.eu/ is detailed in the deliverable "D5.11 – Project Website". The website is a key tool in the dissemination strategy of the project. It includes different relevant sections detailed in the following paragraphs.

4.1.1 Section "Research framework"

The section "Research framework" presents all 12 individual research projects designed towards both scientific and non-scientific people. Each webpage includes:

- An abstract.
- A video by the ESR.
- Administrative information: host institution, duration, PhD enrolment, PhD defence.
- In terms of research project: objectives, tasks and methodology, expected results, secondments, literature.
- The list of publications: conference papers, journal papers.
- The list of outreach activities.

4.1.2 Section "Glossary"

The section "Glossary" aims at helping the scientific and non-scientific people to better understand terms and concepts used within Infrastar. Indeed, sometimes a definition of a term or concept is not fixed. There may be a lack of agreement as to a precise definition, or perhaps there are competing perspectives. In order to make consistent all research works and discussions with each other, as recommended by the End User Advisory Board, a dedicated glossary relevant to Infrastar has been established by the ESRs and validated by the supervisors.

4.1.3 Section "Communication & dissemination"

The section "Communication & dissemination" includes:

- The list of publications.
- The outreach activities.
- Links towards social media
  - Facebook: https://www.facebook.com/infrastar.itn/
  - Twitter: https://twitter.com/infrastar_itn
  - Linkedin: https://www.linkedin.com/in/infrastar-itn
  - ResearchGate: https://www.researchgate.net/profile/Infrastar_Itn
- Links towards ESRs' blogs. Each ESR started feeding and maintaining a blog dedicated to their project blogspot.fr.
  - Infrastar blog: http://bloginfrastar.blogspot.fr/
  - ESRs blog: http://esr**NUMBER**infrastar.blogspot.fr/ (**NUMBER** is the ESR number, i.e. 1 to 12).

4.1.4 Section "Events"

The section "Events" includes the events organised to present the outcomes of Infrastar to scientific and non-scientific people: implementation days and final workshop. See paragraph "4.3 Infrastar events" for more details.

4.1.5 Section "Public archive"

The section "Public archive" includes the Infrastar newsletters as well as the publications.

4.2 Videos

During the first training week at BAM in Berlin, each ESR has recorded a video in order to present themselves and to introduce their project. All videos are available on Infrastar website. They consist of answering the following questions:

- Introduction of yourself (name, home country, PhD topic).

- What is your background - what and where did you study?
- Why did you apply to a Marie Sklodowska Curie ITN?
- What is your research project about? Could explain it to a 10-years-old young "future ITN researcher"?
- How will your research contribute to society?
- What would like to do after Infrastar ITN?

During the ImpDay#2 at Eiffage, each ESR presented their work in 180 seconds as done within the so-called Three Minute Thesis (3MT®) competition. The ESRs had the opportunity to develop their communication skills by effectively explaining their research in three minutes, in a language appropriate to a non-specialist audience. They were allowed one single PowerPoint slide. The videos are available on the Infrastar website:
https://infrastar.eu/communication-dissemination/outreach-activities/three-minute-thesis/

During the ImpDay#3 at COWI, ESR8 and WP3 leader have been interviewed. The videos are available here:
https://infrastar.eu/events/implementation-days/3rd-implementation-day-in-pictures/
They are about the opportunity of collaborations in research between academia and industries, and how to best harvest the advantages of reliability analysis of structures and advanced modelling of concrete fatigue.

4.3 Infrastar events

4.3.1 Implementation days

The purpose of the implementation days is to invite small and large companies, administrations, local authorities, academic experts in the fields of Infrastar in order to get their feedback on the progresses and to boost the networking opportunities. In other words, it offers to meet, exchange ideas and gain insights from each other. Three implementation days have been organised, each one focussed on a specific WP and comprised:

- Keynote presentations by guest speakers.
- Presentation of the WP by the respective WP leader and presentations by the ESRs who were part of it.
- Posters session.
- Round tables.
- 3-minute thesis presentation (ImpDay#02).
- Speed networking (ImpDay#03).

4.3.1.1 Implementation day 1

The ImpDay#01 focused on the Work Package 1: Monitoring and auscultation. The event is detailed in the deliverable “D5.19 – Implementation Days Report”. The report presents an overview of the day that has been organised jointly with the partner organisation BASt, the German Federal Highway Research Institute, in Bergisch Gladbach (Germany) on Tuesday 20 March 2018. BASt regularly organises and hosts a national symposium (with 100 up to 200 attendants). Therefore, the consortium agreed to organise the ImpDay#01 before the aforementioned symposium organised the 21st of March 2018 in order to benefit from the BASt network and thus, to have a larger audience. It was also the opportunity to present Infrastar at the symposium and the Infrastar members to discuss with more people.

In terms of participants, 42 people participated in the event:

- 14 external persons, i.e. persons outside the Infrastar consortium (universities, consultants, providers, research organisations).

- 28 members of the Infrastar consortium (ESRs, beneficiaries, partner organisations, EUAB).

4.3.1.2 Implementation day 2

The ImpDay#02 focused on the Work Package 2: Structural and action models. The event is detailed in the deliverable "D5.18 – Implementation Days Report". The report presents an overview of the day that has been organised jointly with the partner organisation Eiffage in Vélizy-Villacoublay (France) on Friday 12 October 2018.

In terms of participants, 50 people participated in the event:
- 26 externals, i.e. persons outside the Infrastar consortium (engineers, consultants, providers, research organisations, universities): Silesia Structure, Sepia GC, Artelia, Ifsttar, Sixense Necs, Eiffage, Eiffage Marine, Subatech, University ENS Paris Saclay, Société du Grand Paris, Consolis, ETIC, Ecole Centrale de Nantes, Systra.
- 24 members of the Infrastar consortium (ESRs, beneficiaries, partner organisations, EUAB).

4.3.1.3 Implementation day 3

The ImpDay#03 focused on the Work Package 3: Reliability approaches for decision-making. The event is detailed in the deliverable "D5.14 – Implementation Days Report". The report presents an overview of the day that has been organised jointly with the beneficiary COWI A/S in Kongens Lyngby (Denmark) on Wednesday 26 June 2019.

In terms of participants, 49 people participated in the event:
- 22 externals, i.e. persons outside the Infrastar consortium: mostly from COWI, Rambøll, HOFOR-Wind, Osmos Group, Business France.
- 27 members of the Infrastar consortium (ESRs, beneficiaries, partner organisations, EUAB).

4.3.2 Final workshop

Taking advantage of the discussions held during the three implementation days, a widely-open final workshop has been organised at the premises of Clora in Brussels (Belgium) on Thursday 6 February 2020. The workshop targeted the industry and research sectors as well as the European Commission representatives with the aims at sharing the outcomes of Infrastar in terms of scientific results and project management best practices, and at boosting the networking opportunities.

The event is detailed in the deliverable "D5.15 – Final Workshop Proceedings". The agenda comprised keynotes, discussions, posters session, demonstrations, panel discussions, networking. Basically, the morning and the afternoon were dedicated to discussion about sciences and European projects respectively.

In terms of participants, 47 people participated in the event:
- 22 externals, i.e. persons outside the Infrastar consortium.
- 25 members of the Infrastar consortium (ESRs, beneficiaries, partner organisations, EUAB).

5. Exploitation of the results

The exploitation of the Infrastar results have been thought when developing the proposal by including relevant partners from industries and academia through an End User Advisory Board and organisation partners, and then, within a wider extent, through of a dedicated yearly training school.

5.1 End User Advisory Board

The End User Advisory Board (EUAB) comprises relevant external academic and industry representatives, covering the various fields of Infrastar. The EUAB provides an external strategic guidance on the training and research programme but also on the exploitation opportunities created by Infrastar.

EUAB members	**Position**	**Organisation**
Morten Søgaard Andersen	Principal Specialist Civil Engineering	DNV-GL - Renewables Certification (Denmark)
Prof. Jan Bień	Head of the Bridge & Railway Department	Faculty of Civil Engineering, Wroclaw University of Science and Technology (Poland)
Pascal Collet	Senior Civil and Marine Engineer	TOTAL (France)
Dr Peter Lippert	Expert	Deutsche Bahn Netz AG (Germany)
Dr Marc Thiele	Research associate	BAM (Germany)
Prof. Ton Vrouwenvelder	Expert	TNO (The Netherlands)

Table 3: EUAB members.

Three meetings have been organised within the project. Each time, the EUAB members have been asked to assess each project through a SWOT analysis (Strength – Weaknesses – Opportunities – Threats) and provided feedback and advices on the results to be used in the industries. During the Infrastar final workshop, they also assessed the so-called Technology Readiness Level (TRL) achieved by the projects and advised on the next steps to achieve higher TRLs.

5.2 Partner organisations

Three organisation partners are part of the project:

- BASt (Bundesanstalt für Straßenwesen) is the federal highway research institute of Germany. It is a technical and scientific research institute, subordinate to the Federal Ministry of Transport, founded in 1951, with approximately 400 employees. BASt ensures the efficiency of the German highway network including reduction of environmental stress and improvement of traffic safety. Advice is given to state authorities, who are responsible for construction and maintenance of the network.
- EIFFAGE is a leading figure in the European concessions and public works sector, operating through four divisions: construction, infrastructures, energy systems, and concessions. Eiffage civil engineering designs and constructs a large number of engineering structures in France, in Europe and abroad. The company has its own research resources: laboratories, design and engineering and R&D departments, and a number of partnerships with schools, universities and engineering institutions.
- VALEMO is specialized in the control, operation and maintenance of renewable energy facilities. Since its inception, Valemo has been involved in the wind energy sector, and now

works with all the global turbine manufacturers. The company has dedicated R&D activities which develop special software tools.

The partner organisations provided additional training and host researchers during secondments. In addition, they participated in Infrastar events and provided feedback on how to use and exploit the results.

5.3 Training school

Infrastar outcomes are exploited beyond the Marie Skłodowska-Curie action through the so-called “Infrastar Training School”. With this in mind, a logo has been designed (Figure 1) and a website has been set up (https://trainingschool.infrastar.eu/).

Figure 1: “Infrastar training school” logo.

Taking advantages of Infrastar outcomes, the training school aims to provide lectures and hands-on trainings to Master and PhD students, early-stage researchers, young professionals in order to be well aware of all aspects of asset management of civil infrastructures with respect to fatigue of materials, i.e. to put each individual work into perspective. The participants get additional knowledge about their own field but also about what is performed beforehand and afterwards.

The courses provide multi-disciplinary and intersectoral basic concepts in three core fields:
1. Monitoring and auscultation,
2. Structural and action models and
3. Reliability, risk and decision analyses;
ranging from the design to the dismantling of the structures: bridges and wind turbines.

A participant who successfully has taken part in the Infrastar training school is able to understand:
1. How to smarten the structures and its benefits.
2. How to model structural and material behaviours of civil infrastructures under loading.
3. How to develop, perform and assess structural risks and the value of structural information.

5.3.1 International scientific committee

The infrastar training school includes an international scientific committee whose role is to provide advises and guidance as well as suggestions on the content of the scientific programme to make it relevant and up-to-date with respect to the state of the art and the current practices in research and industries. It comprises Dr Odile Abraham (Université Gustave Eiffel - Ifsttar), Prof. Jan Bień (Wroclaw University of Technology), Prof. Eugen Brühwiler (EPFL), Dr Christian Clergue (Eiffage), Pascal Collet (Total), Dr Ernst Niedelerthinger (BAM), Dr Franziska Schmidt (Université Gustave Eiffel - Ifsttar), Prof. Franck Schoefs (Nantes University), Assoc. Prof. Sebastian Thöns (DTU), Prof. John Dalsgaard Sørensen (AAU), Dr Marc Thiele (BAM).

5.3.2 Infrastar training school #1

The 1st Infrastar training school held at Université Gustave Eiffel - Ifsttar in Nantes from 8 to 12 April 2019. It has been decided to have 20 participants (in addition to the 12 Infrastar ESRs) max in order to ease the discussions, to have more interaction and dynamism, and allowing small workgroups.

The applicants had to send a CV and a cover letter explaining why they would like to participate in the training school. Nineteen applications have been received, eighteen have been selected and finally fifteen attended the training in addition to 11 ESRs of Infrastar, that is to say 26 participants in total: 2 Master students, 10 PhD students, 11 Infrastar ESRs, 2 engineers, and 1 researcher. An overview of the participants is presented in Table 4 below.

Position	**Gender**	**Country**
Master students	2 males	1 from France and 1 from Germany.
PhD students	5 females and 4 males	4 from France, 3 from Germany, 1 from Portugal and 1 from the United Kingdom.
Infrastar ESRs	4 females and 7 males	3 from Denmark, 3 from France, 2 from Germany, 1 from Poland and 2 from Switzerland.
Engineers	2 females	1 from France and 1 from Spain.
Researchers	2 females	1 from Germany and 1 from the United States of America.
Total	13 females and 13 males	3 from Denmark, 9 from France, 7 from Germany,1 from Poland, 1 from Portugal, 1 from Spain, 2 from Switzerland, 1 from the United Kingdom and 1 from the United States of America.

Table 4: Overview of participants in the 1st Infrastar training school.

The scientific programme is detailed below and comprised 23 ½ hours dedicated to scientific lectures and exercises and 2 hours dedicated to technical visits:

- Non-destructive Testing and Evaluation for the Infrastructure
  Lecturer: Dr John Popovics (University of Illinois)
- Fatigue in concrete
  Lecturer: Dr Marc Thiele (BAM)
- From sensors to useful signals for concrete evaluation and monitoring
  Lecturer: Dr Odile Abraham (Université Gustave Eiffel - Ifsttar)
- From signals to useful parameters: combination and data fusion
  Lecturer: Dr Ernst Niederleithinger (BAM)
- Probability of Detection (PoD), Receiver Operating Characteristic (ROC)
  Lecturer: Dr Ernst Niederleithinger (BAM)
- Demonstrations and exercises on monitoring and auscultation (groups on Acoustic Emission, on Fibre Optics, on ToF, and on CWI (Coda Wave Interferometry).
- Fatigue verification of structural elements based on data from monitoring
  Lecturer: Prof. Eugen Brühwiler (EPFL)
- Fatigue of R-UHPFRC structural elements
  Lecturer: Prof. Eugen Brühwiler (EPFL)
- Assessment of extreme values of effects in structures
  Lecturer: Dr Franziska Schmidt (Université Gustave Eiffel - Ifsttar)
- Updating of structural models
  Lecturer: Dr Franziska Schmidt (Université Gustave Eiffel - Ifsttar)
- Reliability, risk and decision analyses
  Lecturer: Prof. John Dalsgaard Sørensen (AAU)
- Decision and structural information analyses

Lecturer: Assoc. Prof. Sebastian Thöns (DTU)

5.3.3 Infrastar training school #2

Due to the coronavirus covid-19 pandemic, the President of the French Republic has announced on Thurday 12 March 2020 the closure of all universities, starting Monday 16 March until further notice. Therefore, the 2nd Infrastar training school initially scheduled from 14-17 April 2020 at Centrale Nantes has been cancelled and postponed (the date is not yet set). However, below are presented the application process status and the programme.

The applicants had to send a CV and a cover letter explaining why they would like to participate in the training school. Eighteen applications have been received and eighteen have been selected: 12 PhD students, 3 post-doc researchers, 2 engineers, and 1 researcher. An overview of the participants is presented in Table 5 below.

Position	**Gender**	**Country**
PhD students	3 females and 9 males	1 from Denmark, 7 from France, 1 from Italy, 2 from the United Kingdom.
Post-doc researchers	3 females	1 from Belgium and 1 from France.
Engineers	1 female and 1 male	2 from France.
Researchers	1 male	1 from Spain.
Total	8 females and 11 males	3 from Denmark, 9 from France, 7 from Germany,1 from Poland, 1 from Portugal, 1 from Spain, 2 from Switzerland, 1 from the United Kingdom and 1 from the United States of America.

Table 5: Overview of participants in the 2nd Infrastar training school.

The programme comprises 22 ½ hours dedicated to scientific lectures and exercises, and 2 ½ hours dedicated to technical visits. The lectures are detailed below:

- Design and assessment criteria for safety and cost efficiency
  Lecturer: Prof. Jochen Köhler (NTNU)
- Calibration of partial factor design formats - best practice and challenge
  Lecturer: Prof. Jochen Köhler (NTNU)
- Deterministic and probabilistic approaches of fatigue of steel structures
  Lecturer: Bernard Jacob (Université Gustave Eiffel - Ifsttar)
- Assessment of extreme values of effects in structures
  Lecturer: Dr Franziska Schmidt (Université Gustave Eiffel - Ifsttar)
- From sensors to useful signals for concrete evaluation and monitoring
  Lecturer: Dr Odile Abraham (Université Gustave Eiffel - Ifsttar)
- From signals to useful parameters: combination and data fusion, Probability of Detection, Receiver Operating Characteristic
  Lecturer: Dr Ernst Niederleithinger (BAM)
- Demonstrations and exercises on advanced NDE (fibre optics and Coda Wave Interferometry)
  Lecturer: Dr Odile Abraham (Université Gustave Eiffel - Ifsttar), Dr Xavier Chapeleau (Université Gustave Eiffel - Ifsttar), Dr Ernst Niederleithinger (BAM)
- Decision and structural information analyses
  Lecturer: Assoc. Prof. Sebastian Thöns (DTU)
- Uncertainty and structural reliability assessment
  Lecturer: Prof. John Dalsgaard Sørensen (AAU)