Newsletter #15

March 2021

Content

Activities

Awards and the Salvetti Foundation

Dr. Stefano Salvetti is an important ambassador for the European Federation of National Maintenance Societies. He was for a period of time EFNMS chairman and received the title of honorary member. And moreover, he founded the Salvetti Foundation with the aim of addressing the social importance and professionalism of maintenance in the broadest sense. In his view, maintaining good relationships with universities, top-class companies and international organizations is indispensable for a successful and meaningful EFNMS.

The EFNMS supports this vision and created therefore the EuroMaintenance Awards. Specific objectives and conditions have been included in the EFNMS constitution. The Salvetti Foundation was given the task of facilitating the organization of the various Awards. It has also been agreed that the Salvetti Foundation will sponsor the different prizes The first Maintenance incentive award was presented in 1990 in Wiesbaden. After a number of years, it became clear that it made sense to distinguish more specific target groups for these EuroMaintenance Awards. The following Awards currently exist:

- The European University Awards for the best PhD and Master thesis.
- The European Maintenance Manager Award
- And the best 5 paper Awards that will be presented at the EuroMaintenance conference.

On June 15, 2021, the 16th EuroMaintenance incentive / European Maintenance Manager Award will be presented during the EM2021 gala dinner in Rotterdam. There is also a prize and certificate for the runners-up. The Thesis Awards are presented by Prof Dr. Marco Macchi of the Politecnico di Milano.

The 2021 winners have now been selected for the PhD and Master Thesis Award. (PTA & MTA). The EFNMS and Salvetti Foundation Thesis Awards are intended to promote and stimulate theoretical and applied research in the field of Maintenance engineering and management. This includes information technology - Methods & Systems - Sustainability and Safety.

The Salvetti Foundation views maintenance as a fundamental industrial service activity focused on the economic and sustainable use of resources, the design and management of anthropic systems and the preservation of natural systems. Supported by an intelligent http://www.euromaintenancenext.com and strategic long-term vision that collects not only technical inventions, but also administrative tasks, management, education and supervision activities, open to individual and social needs.

The next EuroMaintenance congress and exhibition will be held in Rotterdam. Organized by the Dutch maintenance organization NVDO. The Salvetti Foundation and EFNMS are looking forward to meet you there.

www.euromaintenancenext.com

News

EFNMS Publications

Take a look at our new efnms-webpage, the Publications page
http://www.efnms.eu/publications/

This page will be further updated during this spring with more publications from the committees and our projects.

We are proud of the collection of EFNMS work. These publications should be considered as support to Maintenance professionals in Europe and world-wide. These are work of authors within the EFNMS Committees but reviewed by their Committee before publishing.

From this page you can go to **"EFNMS Bookshop"** and order the GloMe pdf-book. If your NMS is an EFNMS member you can get an discount for purchasing the book. Please ask the code from your NMS.

Satellite Based Condition Monitoring of Gas Pipelines' Leaks

Dr Jezdimir Knezevic, MIRCE Akademy. Exeter, UK

Development of satellite technology enabled condition monitoring of the leaks of gas production pipelines from the space. Methane is one of the most potent greenhouse gases, second only to carbon dioxide in its overall contribution to climate change. The energy sector is one of the largest sources of methane emissions.

Thanks to powerful technologies, such as high-resolution satellite data, scientists are now able to underline the impact of frequent and intentional methane releases, also known as 'venting.' Scientists, using satellite data from the European Space Agency Copernicus Sentinel missions, are now able to detect individual methane plumes leaking from natural gas pipelines around the world. By combining data from the Copernicus Sentinel-5P and Sentinel-2 missions, along with artificial intelligence algorithms, Kayrros scientists detected 13 methane emission events, with rates up to 164 tonnes per hour in 2019/20, along the Yamal-Europe pipeline (a 4196 km pipeline running across Russia, Belarus, Poland and Germany). Another 33 emission events, with rates up to 291 tonnes per hour, were detected over the same period on the shorter, Brotherhood pipeline. When contacted, operators confirmed that these events were related to planned maintenance and have been duly reported to the relevant authorities. Kayrros has two satellites equipped with Synthetic Aperture Radars that revisits the same location on its orbit every 12 days. However, if both satellites are tasked to acquire an image for a given location, the revisit time is reduced to 6 days.

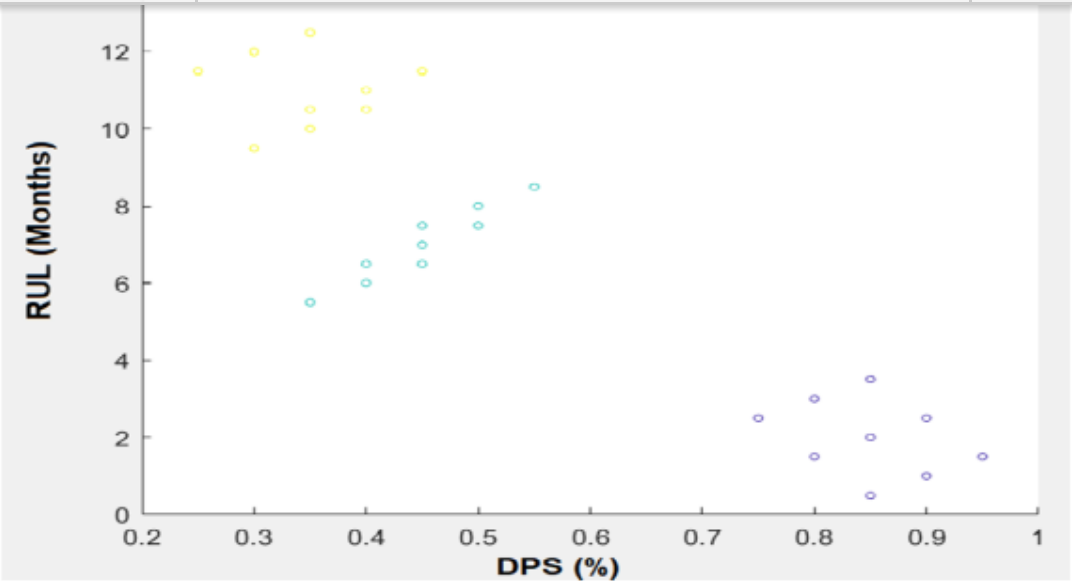
Ability to detect methane hotspots in real-time is not only a major technical achievement but is hugely beneficial for the management of planet.

Source: https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-5P/Monitoring_methane_emissions_from_gas_pipelines (accessed 04.03.2021)

The Artificial Intelligence for maintenance 4.0: The Unsupervised machine learning applied to Maintenance schedule optimization based on equipment Remaining useful life prediction.

The Unsupervised Machine Learning (USML) aims to define a pattern in the set of data without previous knowledge of data features. Therefore, the first understanding of your data set can start by applying the Unsupervised Machine Learning methods to understand the how your dataset can be organized and if there´s a pattern of such dataset based on their independent variables. The concepts behind USML is to cluster a set of data without knowing previous classification or any information about the data. In order to cluster the data, the USML models the dataset and try to organize it in a cluster. The further step verifies the result based on error and finally, If the result is satisfactory, the new dataset can be used the model defined based on the previous dataset and then the model is validated.

Concerning the maintenance engineering, the type of data related to equipment encompasses physical characteristics as well as performance, cost of operations, cost of preventive maintenance, corrective maintenance, spare parts cost and RUL. Therefore, by defining some of such variables, it´s possible to group equipment with similar characteristics. In fact, the data organization based on its common features is the concept behind the clustering data that is the result of such USML method. The figure below shows an example of maintenance planning optimization based on the RUL input from different equipment.



To learn more about the A.I applied to maintenance planning optimization go to the link below.
https://www.eduardocalixto.com/paper-2021/

Events

INSTANDHALTUNGSTAGE 2021

For technicians with passion!
Date: 22.-24.06.2021 I Location: Messe Salzburg (A)

The INSTANDHALTUNGSTAGE 2021 are coming up with a new concept. Due to the given situation, the Event will be held with three special Focus days as an on-site event. Every Focus day includes Lectures, Trainings and an Exhibition on the respective topic. After a comprehensive survey and based on the experience given out of the last months, the organizers decided to focus on the most important issues in maintenance. These are Spare Parts Management & 3D-Printing (Focus Day 1), Condition Monitoring & Predictive Maintenance (Focus Day 2) and Digitized Processes in Maintenance and Asset Management (Focus Day 3).

Would you like to participate on site? To the application form >>
Information & Program >>

Tipp: MFA members receive a 10% discount on the training fees!

About the INSTANDHALTUNGSTAGE:
Networking, exchange of experience and knowledge are the main focus of the industry meeting point, which is being organised by the maintenance experts from dankl+partner consulting | MCP Deutschland together with Messfeld GmbH. All information can be found at www.instandhaltungstage.at.

www.instandhaltungstage.at

Asset Performance 4.0 Hybrid Conference & Exhibition 2021: Early Birds

The 4th Industrial revolution, IoT and predictive analytics are bringing unseen possibilities in maintenance, reliability and condition monitoring. The Asset Performance 4.0 Hybrid Conference & Exhibition offers a unique opportunity to learn how new 4.0 technologies and fundamentals in operations, maintenance and asset management reinforce each other in order to achieve higher equipment reliability and cost performance in asset intensive industries.
Choose to participate live in Antwerp or join all sessions online.

Be a part of this and get access to:

- 3 day conference with workshops & in-depth expert presentations
- The **exhibition** with +50 exhibitors
- **Hackathons** where you can discover new solutions
- Extensive **networking** opportunities with peers & experts
- **Re-watching** of the presentations when you want

Register now & get access to an extensive **database of +100 recordings** of the conference sessions of Asset Performance 4.0 2020.

Who should attend the Conference & Exhibition?
Asset Performance 4.0 provides a comprehensive and attractive agenda of learning opportunities for anyone with a keen interest in increasing asset performance. The Asset Performance 4.0 initiative offers essential insights on how to increase Reliability, Production Output and Quality by using smart solutions and new technologies without omitting the essential basics and best practices.

We address both technical and managerial practitioners active in asset intensive industries across Europe and throughout the world. The audience includes Operations & Maintenance Managers, Plant Managers, Production Managers,

CTO's, Asset Managers, Maintenance & Reliability Engineers, Service Managers, Quality Managers and of course Digitisation Managers, Industry 4.0 Program Managers, AI & Data Engineers and IIoT specialists.

Find out more about our Early Bird rates at www.assetperformance.eu/2021

EuroMaintenance
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Leagal notice

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We hope you've been enjoying the EFNMS Newsletter and other email communications that we've been sending you containing our latest news and updates.

As part of EFNMS efforts to comply with the new General Data Protection Regulation ("GDPR"), which came into effect on 25 May 2018, we would like to inform you that your email and other personal contact information you provided us when you subscribed, currently reside in the EFNMS internal database. We encourage you to take the time to review our revised Privacy Policy.

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Best regards,
EFNMS Newsletter Team

With Maintenance Greetings

Cosmas Vamvalis and Mia Ilkko
EFNMS – European Federation of National Maintenance Societies

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Eini Ontronen
Finnish Maintenance Society, Promaint