OIL INFORMATION TECHNOLOGY JOURNAL

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'STANDARDS'

A report from the **Global CCS Institute**, 'An ESG Reporting Methodology to Support CCS-Related Investment' discusses the 'broad range of reporting models' that have emerged recently along with a significant number of voluntary and non-voluntary ESG standards initiatives and ratings models developed, by various industry organizations, governments, research bodies and market data providers. Standardization of ESG ratings and reporting schemes, remains a critical issue for companies, investors and financiers. The absence of a singular, standardized model of reporting, has resulted in a disparate set of information requirements and methodologies that prove challenging to navigate and interpret. Although there are now leading and widely used examples of both voluntary schemes like the TCFD Recommendations and the Carbon Disclosure Project, and proprietary schemes developed by providers such as MSCI and Sustainalytics, their utility 'may be greatly improved if there was closer alignment on their approach to specific issues or topics'.

The collision of environmental and digital is a popular meme in the IT world and has come to the attention of the **European Union** whose Joint Research Centre's Science for Policy unit has issued a 2022 Strategic Communication Report on 'Twinning the Green and Digital Transitions in the New Geopolitical Context' where we read that while 'environment' and 'digital' are 'different in nature and each subject to specific dynamics', their 'twinning – i.e. their capacity to reinforce each other – deserves closer scrutiny'. To date, the digital transition progressed with only limited sustainability considerations. To diminish adverse side effects and deliver its full potential for enabling environmental, social and economic sustainability, the

digital transition requires appropriate policy framing and governance, as presented in the Digital Compass and Fit for 55 the overarching EU plan for a green transition.

The EU **CEN/CENELEC** standards body is in on the act and in 2021 set up a CEN/TC 467 'Climate change' technical committee where work is underway on the assessment of methane emissions in the gas transmission and distribution network. This report intends to provide aligned technical guidance on how to assess and quantify methane emissions, as well as ensure transparency and comparability of data, to build a reliable basis for the data analysis, identification and monitoring of systematic mitigation activities to the gas sector, authorities and other interested parties. CEN/TC 282 'Installation and equipment for LNG' develops and updates standards in the field of installations, equipment and procedures used for production, transportation, transfer, storage, regasification and use of LNG.

Speaking at the 2022 **Ryder Scott** reserves conference, Herman Acuña presented the **SEC**'s current position on climate-related disclosure. Earlier this year the SEC proposed rules to enhance and standardize climate related disclosures for investors. According to Acuña, the SEC proposal is consistent with the reporting frameworks from the Task Force on Climate Related Financial Disclosures (TCFD) and the Greenhouse Gas Protocol (GHG Protocol). These frameworks are 'already widely accepted and utilized for voluntary disclosures by leading companies'. Read Acuña's presentation in the current Ryder Scott newsletter.

The US **XBRL** Standards Body recently published a white paper titled Supporting ESG Data with Standards. This recognizes the need to manage multiple ESG frameworks. 'The number of ESG frameworks used by companies today is another demonstration of global interest, yet multiple standards, particularly because they may overlap in their coverage, can make it difficult to consistently prepare and analyze ESG data'. To achieve accurate, consistent reporting in the presence of multiple standards, and absent regulatory reporting rules, there must be a common understanding or classification of the data points as used by the ESG community. XBRL suggests that the classification be drafted along the lines of the 'codified standard managed by the Financial Accounting Standards Board. This should then leverage the machine-readable XBRL format such that 'investors and analysts can use the same database and analytical applications with both climate and financial data'.

More familiar to Oil IT Journal readers is the ongoing effort at GHG standardization from the Open Footprint Forum, a unit of The Open Group, that grew from the Shell-initiated OSDU initiative. OFF states 'Currently, the lack of standards for storing, defining, and accessing GHG scope data, including CO2 and carbon, has major business implications', a notion that might be hard to defend in the light of the multiplicity of standardization efforts and fully-fledged commercial offerings we report on here.

The **Professional Petroleum Data Management** PPDM is proposing GHG/emissions standardization as a component of its 'What is a Facility' initiative. WiaF is a 'faceted taxonomy' to describe energy industry facilities. WiaF is designed to fulfil internal data management requirements along with external reporting. 'Regulatory and ESG reporting require data arranged for a facility. A common language and data standard is vital for consistent reporting, analysis, decision-making, and interpretation for operators and external stakeholders.'

COMMERCIAL OFFERINGS

Lisa Wee, writing in Microsoft's The Record', reported on an **Aveva** survey titled Approaching The Age of Performance which found that 'nine in ten companies expect to accelerate their sustainability activities over the coming year in order to tackle climate change'. Moreover, four in five industries want to increase their digital investments to 'drive sustainable business models' leveraging technologies such as AI and cloud computing to lower carbon intensive operations and 'expedite the move to net zero'. Handily, Aveva's Data Hub has been repurposed from its original industrial data management scope to 'provides a data trail that

proves energy comes from low-carbon sources, providing proof of net-zero commitments to investors and environmental, social and governance auditors'.

Opex Group's Emissions.AI is a digital solution that helps carbon intensive companies decarbonize their operations and reduce emissions, energy and fuel costs. The 'first of its kind', Emissions.AI is a technology solution created specifically for complex facilities. It contextualizes operational emissions and leverages engineering first principles, analytics, and AI to identify hidden operational inefficiencies, improvements and opportunities for lower emissions and costs.

Microsoft's own #BuildFor2030 initiative aims to advance the UN Sustainable Development Goals leveraging the 'Microsoft Cloud for Sustainability' to help customers aggregate sustainability data in an actionable way and provide accurate carbon accounting.

Also in the latest Microsoft Record, **Schneider Electric**'s Olivier Blum observed that real-time access to carbon dioxide emissions data is a prerequisite to decarbonization. However, a Schneider Electric and Greenbiz survey of more than 300 corporate energy and sustainability professionals revealed that 52% cent are still relying on 'archaic spreadsheets' (this is the Microsoft Record right?) to manage their energy and sustainability data. Enter the Resource Advisor platform, Schneider's 'ERP for ESG', AI-powered cloud-based software for sustainability metrics and reporting.

Shell and **SAP** are to co-innovate on greenhouse gas emissions accounting solutions and supply chain management practices so all players in the value chains can measure and reduce their greenhouse gas footprint. Shell is a founding member of the Open Footprint Forum (a unit of The Open Group), working together to create a common model for footprint-related data covering all emission types, consumption, and base calculations to normalize and aggregate industry data. Shell's Powering Progress strategy sets out to accelerate the transition of Shell's business to net-zero emissions. Shell intends to collaborate with SAP on carbon accounting and management solutions.

This short and unauthoritative compendium of GHG/emissions standards and solutions is probably a small subset of what is available in the market and from regulators and standards bodies. Please ping us on info@oilit.com if your favorite GHG reporting methodology is missing.

OSDU FORUM SETTLES ON BLUWARE VDS SEISMIC DATA STANDARD

Eliis leverages Bluware FAST to plug PaleoScan into OSDU platform.

Last time we looked, there was something of a tussle between advocates of Bluware VDS data format and the traditionalists rooting for the Society of Exploration Geophysicists venerable SEG-Y. An announcement from Eliis, developer of the PaleoScan seismic stratigraphic interpretation framework, has it that Bluware VDS is now the 'recognized standard of the OSDU data platform for seismic storage and exchange'.

Eliis joined The Open Group OSDU Forum in 2020 with the objective of evolving PaleoScan to meet the new data standards. As its first step in the OSDU journey, Eliis is leveraging Bluware's FAST 'adaptive streaming technology' to connect PaleoScan with the OSDU platform.

VDS, is described as a 'powerful and flexible storage format for signal data' supporting both file-based and cloud-based object storage along with optional data compression. Users can make trade-offs between quality, storage requirements and performance, leveraging different compression modes.

PaleoScan can now work with VDS formatted data streaming from the cloud, leveraging cost-efficient, and scalable object storage (AWS S3 or Microsoft Azure BLOB) with FAST providing on-the-fly translation

into PaleoScan volumes on a virtual drive. Paleoscan is now working to store 3D attributes and interpretation volumes on the OSDU platform. More from Eliis.

AND THE WINNER IS …

Oil IT Journal editor Neil McNaughton, the 2022 SPE Regional Data Science and Engineering Analytics Awardee, is pleased. But he misses his 15 minutes of fame, as well as a more public recognition of his (and other awardees') achievements.

I do not in general write about awards. The cynic in me regards them as having dubious merit when given to others. I naturally make an exception for the occasion when I myself am the recipient! I say occasional because the last and only previous award was my much appreciated PNEC Award handed to me back in 2006 in person by the late Phil Crouse.

I have since then attended quite a few awards ceremonies in the past, at the SEG and SPE notably. Both do a great and grand job of organizing the presentations at respectively the SEG Annual Convention and the SPE ATCE. When I applied for (sorry should say, 'was nominated for') an award earlier this year I fondly imagined myself walking proudly on stage to the sound of rousing music and possible even taking home a grand hard cover folder with the citations of my own and other awardees' achievements. I say 'fondly imagined' because I did not really expect to get the award having been, over the years, more of a consumer of the output of the SPE/SEG/AAPG societies than a contributor. So I was pleased and indeed honored that, thanks to the best efforts of our local SPE section and support from some SPE luminaries I did receive the award, the 2022 Regional Data Science and Engineering Analytics Award. I was ready for the catwalk.

I was also keen to see how the SPE would be broadcasting the 2022 awards to the wider world (well at least to the membership). The award was made as 'an acknowledgement of your outstanding contribution and significant accomplishments in this area at regional level'. OK, well we will just have to pass quickly by on my contribution to 'data science'. The SPE has moved the award category goalposts around some in the last few years. This award used to be known as the 'Management and Information Award' which I would have preferred as nearer to my skill set such as it is. But wait a minute, what is this about 'regional'? It turns out that instead of strutting my stuff at the ATCE, I have an invitation to the 'Regional Section Officers Meeting' in Bucharest next month. Now I am sure that Bucharest is a nice place, it may even be nicer than Houston. But a 'Regional Section Officers' meeting does not have the same ring to it as the ATCE.

At the time of the award I was informed that 'as one of our prestigious award winners, your name will be listed on www.spe.org'. Great thought I. So I visited the SPE Awards website to see how these are recorded. I was surprised and disappointed to see that awardees, be they regional or international are just names on a list. There is no indication as to why they got the award, what significant achievements they made or what. I know, and you may know, what previous awardees like Jim Crompton, Reidar Bratvold, Donald Paul and David Archer's achievements were. But for future generations they are all just names on a list. So I thought that I would use this opportunity of setting the record straight by publishing a citation: my own, naturally.

TECHNICAL ACHIEVEMENTS AND CONTRIBUTIONS OF THE CANDIDATE

> *Neil McNaughton has successfully leveraged years of oil and gas industry experience and hands-on IT skills into his regular reporting and analysis of the current state of play in oil and gas IT. Oil IT Journal initially filled a wide gap in the industry's knowledge base, that of upstream data management. With regular reporting from seminal industry conferences, almost all organized by commercial entities outside of the traditional learned societies, McNaughton brought the embryonic field of to a wider audience, at the same time, capturing, over the years, a body of knowledge that make Oil IT the journal of reference that it is today.*

McNaughton has applied the same approach to the broader field of oil and gas information technology. Again, while reporting on innovations as manifested at the major industry conferences (SPE ATCE inter alia), McNaughton observed that key information to real-world practitioners is often overlooked by the 'academic' and 'non-commercial' constraints of the learned societies. This led to coverage of the major vendor conferences (SAP, Esri, OSIsoft/PI and others) and more 'telling it as it is' reporting from users of these major products in operating oil companies.

Oil IT Journal's impact in the oil and gas industry can best be judged from the readers' testimonials which cite Oil IT as "a great source of information, even months and years after publication", Neil McNaughton's "erudite, informed, and comprehensive coverage of everything related to data and IT solutions in the upstream arena," as providing "a deep insight into the E&P industry and a clear understanding of the technical and commercial challenges we face," and finally "Oil IT Journal has no equivalent in the field of technology watch. The publication captures different viewpoints, quotes and provides a critical analysis that is rare in scientific journalism. Also Oil IT Journal's content is at the crossroads of IT and upstream technology and is replete with information and the evolving standards landscape over the years."

Many in the oil and gas industry pay lip service to the notion of 'breaking down the silo walls' between different disciplines. This has proved harder than realized, as 'silos' are baked into corporate structures and member organizations . However, information technology cuts across the silo boundaries. Through Oil IT Journal, Neil McNaughton has leveraged this realization over the years, expanding coverage across the full spectrum of the oil and gas vertical. Coverage today includes geoscience, engineering, process control, geographical information systems, standards and more. Oil IT Journal has also diligently reported on the energy transition with a 'Going Green' rubric that first appeared in 2010.

Well that's just part of the citation. You can read the whole thing here.

And finally a big thanks to the SPE local section officers who managed the nomination process and to the kind SPE luminaries who backed me.

BOOK REVIEW: 'HOW THE WORLD REALLY WORKS' BY VACLAV SMIL

On the jacked blurb to Vaclav Smil's new book 'How the World Really Works by Vaclav Smil, A Scientists Guide to our Past, Present and Future', we read 'if you are anxious about the future and infuriated that we aren't doing enough about it, please read this book'. We did and were entertained with Smil's analysis of the world energy situation, his exposé on the 'four pillars of civilization' and on our extensive reliance on fossil fuel. Smil likes to challenge current thinking on energy, food, technology and related matters. But when you are through with How the World, our may be more anxious than when you started reading!

This is quite a short work, a couple of hundred pages of text, padded-out with another hundred pages of references and indexes, but packed with information and argument. Smil has a lot to say about energy, maybe one third of the book. A subject that he ties closely to population. For instance, to bring the three billion poorest 40% of the world's population up near a dignified standard of living means doubling or tripling their use of energy. In the face of the unfolding issue of climate change, the much touted switch to renewables comes up against the uncomfortable fact that ours is a 'fossil-fueled civilization' and 'we cannot walk away from this critical determinant of our fortunes in a few decades, never mind years'. In the introduction Smil advocates moving away from extreme views. The world is not going to end in 2030, nor is artificial intelligence going to fix everything. He promises an agnostic view of how the world really works and what the chances are of 'better prospects for the next generation'.

And so to energy, 'the only true universal currency', even though it is one which does not much concern the economists except when prices spike! Energy is also poorly understood by the general population and many journalists, witness the frequent mix ups between kilowatts and kilowatt-hours. Following a short history of the rise of fossil fuels and the unfortunate consequences of CO2 as a greenhouse gas Smil acknowledges that 'according to most climate models, keeping global warming under 1.5°C would mean reducing CO2 emissions to zero by 2050'. Nothing new there. 'Net zero' requires continued CO2 emissions to be 'compensated' by (as yet nonexistent) large-scale removal of CO2. Net zero has led to a 'me too' game with many companies pledging allegiance. Smil take some pleasure (Schadenfreude?) in unpicking Germany's struggling Energiewende transition.

Getting back to energy as currency, Smil turns to food production, taking a Socratic middle way through the debate. While vegan 'is a waste of valuable biomass' (due to indigestible cellulose), 'carnivory' has no proven nutritional benefits. But fossil fuels and (energy laden) fertilizers crop up everywhere. Energy and mechanization have hiked food productivity by orders of magnitude. In two centuries, the human labor required to produce a kilogram of wheat has been reduced from ten minutes to less than two seconds. 'That is how the world really works!' Another fascinating energy and food fact is that 'putting a kilogram of roasted chicken on the table requires at least 300mg of diesel. And out of season tomatoes from heated greenhouses need 500mg/kg of diesel. Once that tomato has been trucked to a consumer in Scandinavia, the cost in diesel climbs to 650mg/kg. Adding up the whole food-related supply chain and we find that around 20% of US energy is devoted to food. 'Even if we try to change the global food system as fast as possible we will still be eating transformed fossil fuels for decades to come'.

Smil has little time for current focus on intangibles (GDP growth, debt, IPOs), nor for trendy technology (5G, AI). The four pillars of modern civilization come from the material world and are ammonia, plastics, steel and concrete. He digs deep and insightfully into each of these pillars, all of which are closely linked to energy. Moreover, 'until all the energy used [making the four 'pillars'] comes from renewables, modern civilization will remain dependent on fossil fuels'. 'No AI, no apps, no electronic messages will change this'.

Other chapters cover globalization and risk, with up to date (Covid 19 but not Ukraine) insights. On risk, Smil compares humanity's knee-jerk reaction to some low probability events that hit home (9-11 and the ensuing billion dollar wars in Iraq and Afghanistan) and the blind eye that the American people turn to gun violence.

By now you will be wondering what exactly Smil's take on anthropogenic global warning actually is and what exactly 'we should be doing' as promised up front. His opinion is tucked away in a chapter on 'understanding the environment' where he promises an 'unorthodox' approach explaining how the 'life-enabling' greenhouse gas effect has been 'enhanced' (mostly by fossil fuels) to become the main driver of anthropogenic global warming. Smil claims that the physics behind AGW were well understood over a century ago and that it didn't take either computer modeling or the establishment of an 'international bureaucracy' (the GIEC) to make us aware of the problem. He is fairly dismissive about the efforts that the world has put into countering CO2 emissions. Progress in Solar PV and wind turbines has been 'completely negated' by rising emissions in Asia.

Smil's own position on what should be done is hard to pin down. He is dismissive of both the GIEC's advocacy for water wind and solar coming (WWS) to the rescue in any reasonable time frame. He is equally dismissive of the more catastrophic claims of the environmentalists. His main argument is that WWS is being developed too slowly and will have a hard time supporting the four pillars of civilization and that anyhow, the energy needs of the developing world will blow apart all the targets. So Smil's 'unorthodox' position is that 'the sheer scale, cost and technical inertia of carbon-dependent activities make it impossible to eliminate all of these uses in just a few decades'. At the same time he advocates switching from coal to

natural gas (remember, this was written before Ukraine) and from SUVs to electric cars, all of which is hardly unorthodox.

Non carbon energies 'could completely displace fossil carbon in one to three decades only if we were willing to take substantial cuts to our standard of living'. One takes it that Smil considers this unlikely. More achievable CO2 reduction is possible but over what timescale this may take effect is moot. 'We cannot know to what extent [such measures] will succeed by 2050' and 'thinking about 2100 is truly beyond our ken'.

In this reviewer's quest to figure out what Smil's position on AGW, whole chunks of his reasoning and commentary have been left aside. He takes some great swipes at the forecasters, computer modelers and AI brigade. His analysis of world population growth and past prediction errors is fascinating. The size of the world's population is as key to our future as it is uncertain. Smil is an entertaining, erudite and engagingly curmudgeonly writer. He is better at knocking current orthodoxies than proposing solutions. Perhaps he is right that there are no silver bullets to fixing climate change.

* How the World Really Works Viking Press 2022, ISBN 9780241454398

AI AND THE CEMENT BOND LOG

NNTU researchers report progress on machine learning-assisted log interpretation. The Equinor-sponsored study to be released as open source code.

The Centre for Innovative Ultrasound Solutions, part of Trondheim-based NNTU, the Norwegian University of Science and Technology gas been working on machine learning-assisted interpretation of cement bond logs. The project is 50% funded by Equinor whose engineers also work on the software tool. In his blog, CIUS researcher Erlend Viggen reports that the tool is now in active use by Equinor's cased hole logging group.

Initially a convolutional neural network was trained with subject matter expert interpreted log data, tagged according to an opinion-based scale from 'good' to 'poor'. However it proved hard for interpreters to stay consistent, leading to 'overfitting' as that the machine 'gets the wrong idea from its training data'.

Another problem is noisy data. Noise is easy for an experience interpreter to ignore but causes problems to the computer. This issue is addressed by 'feature engineering' i.e. looking for a set of features in the log data that are known to be predictive. At the same time, Equinor has provided a more interpretive and granular classification schema with some 30 interpreted categories.

Viggen is now also moving from complex CNNs to simpler classifiers which have proved more robust to overfitting. Further improvement came from the integration of constraints derived from domain knowledge to remove some of the noisy data (such as spikes near casing collars and centralizers). The result is a classifier that now 'agrees' with human interpreters 64% of the time. The Python code for the CBL classifier will be released at some time in the future along with the rest of Equinor's interpretation library.

Another CIUS R&D project involves the development of new technology for corrosion detection in oil and gas pipelines. An experimental setup has been established at partner Sensorlink's facilities to develop a prototype system for testing.

UK DIGITAL ENERGY STRATEGY GROUP

New organization to 'drive North Sea growth and modernization'. Common data sharing toolkit and open data triage system announced.

A group of UK-based quangos* have formed the Offshore Energy Digital Strategy Group to 'drive North Sea growth and modernization'. The DSG is backed by Crown Estate Scotland, Marine Management Organization, the Marine Scotland Directorate of the Scottish Government, North Sea Transition Authority (NSTA), Ofgem and the Crown Estate. The DSG was set up to implement the key recommendations of the Digitalizing Offshore Energy Systems 2022 report published by Energy Systems Catapult. The report also recommended the development and delivery of a 'common data toolkit' to facilitate 'controlled and automated data sharing across the sector. The DSG is also to 'coordinate digitalization efforts to enable efficient investment and capture cross-sector requirements'. Four workstream recommendations are to be kicked-off as follows. intended to address key issues:

- A Whole System Planning workstream will develop a system view of existing and planned infrastructure, aligning different data layers to provide a forward view of development requirements.
- A data coordination task force is to drive interoperability of data portals across the sector and promote the discoverability and reuse of existing data.
- An 'Open data triage' process will be initiated to increase the use of existing operational and asset data. The open data triage approach was developed for the UK power sector to increase public data sharing.
- Finally the DSG is to work on 'offshore emissions data for net zero, monitoring of targets and tracking missions tracking with high-resolution and digital emissions data monitoring and reporting'.

The seven core members of the DSG will be supported in the project by expert contributors including the Net Zero Technology Centre, the Technology Leadership Board, Offshore Energies UK and RenewableUK. *Some great commitee meetings in store!*

** Quasi-autonomous non-governmental organization.*

SOFTWARE, HARDWARE SHORT TAKES …

Upstream: Beicip's OpenFlow 2022, AspenTech Paradigm 22, Esri updates ArcGIS Business Analyst Pro, BuildCentral launches Geospatial Energy and Mining, Quorum Energy Suite 'expanded', Rock Flow Dynamics's tNavigator updated, Ceetron releases new ResInsight. **Operations/downstream**: Brad Adams Walker aligns with ISO 11064, new solutions from Dover Fueling, Geoforce's new asset trackers, Implico's Connected Truck now in SAP Store. **Computing**: Altair cleared to sell 'alternative' SAS language, ArrayFire's 'free' GPU Python math library, MemComputing's HPC architecture, Siemens/NVIDIA team on 'industrial metaverse', NVIDIA - parallel Fortran for GPUs.

UPSTREAM

Beicip, the consulting and software arm of the French Petroleum Institute IFPen had rolled out OpenFlow 2022, its flagship E&P Software. The expanded offering is said to be a 'complete platform for basin, petroleum system and reservoir assessment' with solutions for geothermal and carbon storage modeling. OpenFlow Suite is now is also available in the cloud. Read the rather elegant release notes.

AspenTech has rolled-out Paradigm 22 with improved classification and volume visualization functionalities and a 'one-stop-shop' in is Integrated Canvas. Legacy applications VoxelGeo and Stratimagic

have been replaced by new licensing configurations of SeisEarth. The release addresses the energy transition with new functions in SKUA-GOCAD and Geolog targeting the geothermal energy and carbon capture and storage market segments. More from ApsenTech/Paradigm.

Esri has announced new functionality in ArcGIS Business Analyst Pro, an ArcGIS Pro extension for spatial analysis and modeling. The latest version allows for the management of locally-installed 'connectable' datasets that can be accessed without installing the software. More in the Esri article on connectable datasets for ArcGIS BA.

BuildCentral has launched Geospatial Energy and Mining (GEM) targeting, inter alia, resource extraction and processing, and pipeline projects. GEM spans exploration, feasibility operations and maintenance. More from BuildCentral.

Quorum Software has announced an 'expanded global vision' for its Quorum Energy Suite flagship. Following last year's merger between Quorum and Aucerna, and the acquisition of TietoEVRY's Oil and Gas software business, Quorum has unified its 38 applications into a single portfolio. Applications span nine functional areas of the industry from upstream planning, economics, and reserves through execution and well operations, accounting, land management, and production optimization, to midstream and measurement, plus transportation and cargo logistics. More from the new website.

The V22.2 release of **Rock Flow Dynamics**'s tNavigator introduces a multicomponent model of fluids and proppants for flow calculations during fracking. A custom database of fluids and proppants can be created and maintained. For geosteering applications, real time data streaming in WITSML format has been implemented. The new release includes multiple improvements to Network Designer and integrated subsurface-surface modeling. Support for mining industry formats and features has been added to Geology Designer. More from Rock Flow.

Ceetron Solutions AS has released version 2022.06 of ResInsight with improved workflows, drag and drop functions and plotting. More in the release notes and download the code from GIT.

OPERATIONS/DOWNSTREAM

Brad Adams Walker warns operators of 'dated' control rooms that they may not be aligned with the latest ISO 11064 standard for ergonomic design including layout and dimensions of workstations. ISO 11064 is a 'tome' of control room best practices, the purpose of which is to enhance human performance and promote safety. BAW is offering a control room audit to establish a road map to get to ISO 11064 compliance. 'Don't let your dated control room become a hazard to your employees and your company'.

Dover Fueling Solutions has announced a range of new solutions for the retail fueling market. Too many to mention here! Visit Dover for more.

Geoforce has rolled out two new rugged asset trackers. The new GT2c device operates on LTE-M low-power cellular IoT networks for operations in cellular service range. The GT2h hybrid device operates on cellular networks where available, automatically switching to Iridium-powered satellite connectivity if cellular coverage is lost. Both integrate with Geoforce's Track and Trace software platform. More from Geoforce.

Implico's Connected Truck solution is now available on the SAP Store and is part of SAP's industry cloud portfolio for oil, gas, and energy. The solution leverages the integration capabilities of SAP Business Technology Platform (SAP BTP) to integrate with SAP S/4HANA using SAP Integration Suite. Connected

Truck establishes a direct link between truck driver and back office, a 'game-changer' for trip planning and reconciliation for bulk deliveries. More in the release.

COMPUTING

Following a protracted legal tussle, **Altair** can now market the 'alternative' SAS language it acquired when it bought UK-based World Programing last December. WP was involved in a long legal battle with the SAS Institute over alleged copyright infringement, this has now been settled. Altair is now enthusiastically promoting the SAS statistical programming language as a component of its 'Altair Unlimited' data analytics offering. SAS was originally developed in the 1970s but Altair believes that for many functions 'the language remains exceptional, and its use for data processing across industry is still widespread'. More in the Altair release.

ArrayFire, developer of the Jacket GPU engine for Matlab has released a new open source project. The eponymous ArrayFire Python library of math functions for GPUs is 'totally free'. ArrayFire offers a high level, cross platform environment spanning CUDA and OpenCL targets including NVIDIA GPUs, AMD GPUs/APUs and Intel processors, as well as mobile OpenCL devices from ARM, Qualcomm, and others.

Jon Beane, speaking at a recent meet of the Society of High Performance Computing presented the technology that his company MemComputing is developing. MemComputing is working on a novel architecture that combines compute and memory in the same chip. It is said to be 'similar to quantum computing' but runs (could run?) on today's silicon. The canonical (2015) MemComputing reference 'NP-complete problems in polynomial time using polynomial resources and collective states has since kicked-up some critical dust.

Siemens and **NVIDIA** are teaming on an 'industrial metaverse' to 'transform manufacturing' with immersive experiences across the lifecycle. The solution will connect NVIDIA Omniverse and Siemens Xcelerator platforms to enable full-fidelity digital twins and connect software-defined AI systems from edge to cloud. More in the release.

A blog on the NVIDIA developer website by Miko Stulajter and colleagues discusses the use of Fortran standard parallel programming for GPU acceleration. Standard languages have begun adding features that compilers can use for accelerated GPU and CPU parallel programming, for instance, 'do concurrent' loops and array math in Fortran. Such features make for future-proofed programming. Fortran's 'do concurrent' is a standard language feature and 'the chances of support being lost in the future are slim'. Do concurrent is also a great way to add GPU support without having to learn GPU-specific code.

OFFSHORE ENERGIES UK 2022 VALUE OF DATA CONFERENCE

Opex Group unlocks carbon emissions savings. Neptune's 'pragmatic' digital twin. NSTA repurposes legacy seismics. Hawtin 'no chance of industry standard standards'. Petrofac on 'stranded' equipment data and digital engineering.

Chris Ayres explained how Opex Group is using operational data to 'unlock' carbon emissions savings. This is achieved using its flagship 'Emissions.ai', digital solution that helps carbon intensive companies decarbonize ops and reduce emissions, energy and fuel. It contextualises operational emissions and leverages engineering first principles, analytics and AI to identify hidden operational inefficiencies, improvements and opportunities to lower emissions and costs.

Alan Bibb (**Neptune Energy**) observed that the 'Digital Twin' is 'too wide a topic to cover in general terms' and that the term means different things to different users. Neptune's digital twin journey has been

'incremental, tactical and pragmatic' with a focus on value generation. Ideally a twin should support as-built verification, virtual surveys, clash detection and other management of change tasks. Expected asset behaviour should be compared to actual behaviour in real-time. Contextual access to asset data generates insights and liberates data silos. While the digital twin is achievable (and can be funded) in the design and construction phases, the shift to operations is proving more challenging. Operations require richer data, contextualisation and transformation of 'business as usual' tasks. Finding funds for such activities can be hard. There are multiple barriers to overcome from limited search of tag-based data to cultural issues. Users want simple tools and workflows adapted to a range of activities including engineering and offshore operations. Data quality and governance is also problematic. However, the opportunity for value generation is good, particularly if there is buy-in from EPC/contractors. Ideally the twin should be an 'agnostic and open solution'.

David Lecore (**North Sea Transition Authority**) recalled with satisfaction his earlier study (co-authored with Steve Hawtin) on the Value of Data (reviewed in Oil IT Journal in 2011), now seen from the standpoint of the regulator (Lecore was previously with Common Data Access). In the 'Value' study folks were asked about how long seismic data was likely to hold value. Most opined that value would disappear after less than 10 years. In fact, of the approx. 4,000 seismic surveys on the UKCS, some 3,700 are pre Y2K. Far from having little or no value such surveys are seeing re-use. One source of this unexpected value is the mooted use of depleted Southern North Sea fields for carbon dioxide sequestration or gas storage. If the value of data is now accepted, what's all the fuss today, why are we still talking about data management? Industry had unfortunately a record of unscalable pilot projects, poor resourcing (people and funding) and a failure to appreciate how hard data projects are. More generally, there is too much focus on digital and not enough on data quality and governance.

Steve Hawtin, (**White Turret**) is the author of the book 'The Management of Oil Industry Exploration and Production Data' which we reviewed back in 2013. Hawtin reflected on what has changed since 2013 to conclude that the key data issues are not technical, there are no silver bullets and that management of change is critical. This involves getting people to adopt new ways of working, achieving agreement and focus and overall, clarifying what is required. The first step to improving the data situation is to define how things ought to work, by documenting context, uses and processes. On the topic of data standards, Hawtin illustrated his approach with a fictional 'Umbrella Oil' company with and a slide showing a shelf full of data standards and a compendium of such available as a huge tome. After the event Hawtin explained to Oil IT Journal, 'I have actually implemented exactly this approach in a number of real companies (some quite big ones), each one has applied the basic concept in a completely different way. In my view there is no chance of developing an 'industry standard' set of data standards. Rather, what I have developed is a standard way to explain the benefits of actually writing this stuff down, and a set of steps to establish an internal team with the tools and contacts to start doing that. The standards that those teams have then produced have varied wildly in scope, content and application from one company to the next, each focused on the aspects that their organisation sees as the most important. It is hard enough to establish a consensus within a single company.'

Steve Johnson's company, contracting engineer **Petrofac**, has extensive experience of data collection and use and is able to realize some of the 'unharnessed potential' of data. Data gathered over a multitude of projects has enabled a probability analysis of completion times and likely delays. Analysis of previously siloed data revealed that the assumptions on the time to complete certain activities were 'questionable'. In many cases there was a greater than 50% chance that the task would take longer than anticipated. Many assets possess a potential wealth of machinery data but this is often 'stranded' and only accessible locally. Stranded data represents a lost opportunity, restricting the ability to manage the performance and health of the equipment. 'Embracing digital is the enabler that will unlock the value. A virtuous cycle between digital and data will happen when digital adoption promotes increased recognition of the importance of data. Johnson also advocated the use of a 'cognitive search engine' to source key data and information in large volumes of documentation. Other enablers are IIOT/LoRaWan type communications that connect the workforce, providing insights that improve construction management and enhance workforce safety and

productivity. Johnson is also keen on using data science to improve asset management with proactive intervention.

More from OEUK.

FOLKS, FACTS, ORGS …

Movers and shakers in this issue hail from Cognite/Aramco JV CNTXT, Brüel & Kjær Vibro, Canes Midstream, CGG, Chevron, Renewable Energy Group, Colonial Pipeline, EnLink Midstream, Excelerate Energy, Hexagon, Ikon Science, Inductive Automation, JD Martin, Jōb Industrial Services, Motiva Enterprises, Norwegian Petroleum Directorate, North Sea Transition Authority, Navigator CO2, NextMart, North Sea Transition Authority, Qnergy, Ranger Energy Services, Ryder Scott, SEG Foundation, SeekOps, TXOne Networks, Validere

Abdullah Jarwan has been appointed CEO of the new Cognite/Aramco joint venture **CNTXT**. He hails from Aramco

Brüel & Kjær Vibro has named Volker Polonyi as CEO and president. Polonyi joins from parent company NSK where he was director of the EU Technology Centre.

Dallas-based **Canes Midstream** has appointed Mike Hicks to COO and Dan Westcott as CFO. Hicks was latterly with Superior Pipeline Co., Westcott hails from Legacy Reserves.

Agnès Boudot heads-up **CGG**'s new HPC & Cloud Solutions business. She hails from Atos.

Following **Chevron**'s acquisition of Renewable Energy Group, REG president and CEO Cynthia Warner has been appointed to the Chevron board.

Colonial Pipeline has named Darrell Riekena Senior VP and CIO. He was previously CIO and executive VP at Republic National Distributing Company.

Jesse Arenivas is the new CEO of **EnLink Midstream** replacing retiree CEO and chairman Barry Davis. Leldon Echols takes over as chairman.

Excelerate Energy has appointed Deborah Byers as independent director and chair of the audit committee. Byers recently retired as a partner from Ernst & Young.

Paolo Guglielmini will become president and CEO of **Hexagon** at year-end 2022, succeeding succeed Ola Rollén who is to be proposed as chairman of the board next year. Guglielmini is currently Hexagon's COO and president of the Manufacturing Intelligence, a role that will be taken over by Josh Weiss.

Ikon Science has named Dan Tostado VP Sales for Latin America. Vadim Khromov has been appointed VP Sales North America. He hails from CGG.

Colby Clegg is the new CEO of **Inductive Automation**. Kat Robinett becomes COO. Robinett's previous role as CTO will be taken up by Carl Gould.

Kevin Fugate has joined **JD Martin** as a business development consultant.

EPC **Jōb Industrial Services** has named Scott Stenberg as CFO. He was previously director of finance.

Motiva Enterprises has named Jeff Rinker president and CEO, replacing Brian Coffman who is leaving the company. Rinker was previously with Husky Energy.

Ingrid Sølvberg has resigned from her post as Director General of the **Norwegian Petroleum Directorate**. Torgeir Stordal, director of technology, analysis and coexistence is acting DG until further notice. Sølvberg leaves to a position in the private sector.

The **North Sea Transition Authority** has announced 'what is thought to be one of the first non-executive director job share positions on a UK board'. The position is being shared by Fiona Mettam and Vicky Dawe, who also job share the role of Director of Energy Development and Resilience at the Department for Business, Energy and Industrial Strategy.

Navigator CO2 Ventures has hired Tyler Durham as Chief Development Officer and Senior VP. He hails from Schlumberger.

Oscar Maldonado is now president and CEO of **NextMart**. He was previously owner of Two Brothers, LLC, a specialized oil field service company that has just been acquired by NextMart. In an earlier life, Maldonado was with Occidental.

Stuart Payne has been appointed as chief executive of the **North Sea Transition Authority**.

Methane abatement solutions provider **Qnergy** has appointed Michael Taylor as COO. He was previously director of logistics at Skullcandy.

Ranger Energy Services has announced today the appointment of Melissa Cougle to CFO. She hails from Frank's International and National Energy Services Reunited.

Jeff Craggy has joined **Ryder Scott**'s Data Science Group as data analyst. He was previously with Analog Devices.

The board of the **Society of Exploration Geophysicists Foundation** has promoted Katie Burk to the new leadership position of Foundation Managing Director. Burk is a 15-year SEG employee.

Following 35 years with Schlumberger, Simon Bittleston has joined the advisory board of **SeekOps**.

TXOne Networks has made the following hires: John Elder, channel director; Austen Byers, technical director, and De Anne O'Connell, marketing director.

Validere, a commodity and carbon management software boutique had hired Erin Tullos, Jen Synder, and Amber McCullagh its market fundamentals team. Tullos is a former environmental risk management team lead at ExxonMobil. Snyder comes over from Wood Mackenzie, McCullagh from Enverus. Validere has also hired Adam Bedard as chief strategy and corporate development officer. He was previously with Palantir Technologies.

SALES, PARTNERSHIPS, COLLABORATION…

SEAM and Advanced Geophysical Technology, Petrobras/CGG, SAExploration/Geospace, INT, SATEC to ANPG, Novus, Datagration and Formentera, Flutura and Petrogenium, Innio Waukesha Gas, Detechtion, Accenture to Colonial Pipeline, CruxOCM to Phillips 66, EN Engineering and G2 Integrated Solutions, Orbital Sidekick to Energy Transfer, Implico to DCC Energy, Tangent Works/Altair, Juniper Networks to Oil India, Altair and Oracle, Aramco and Cognite, Constellation Clearsight and Voliro, IFS to Interwell, MFE Inspection and Thermo Fisher Scientific, Optime Subsea to Aker BP, RocketFrac Cleantech, Schlumberger, Subsea 7 renew OneSubsea, Tachyus to ONGC, TechnipFMC to Equinor, Neptune Energy

UPSTREAM

The **Society of Exploration Geophysicists**' Advanced Modeling Corporation (SEAM) has selected Advanced Geophysical Technology to manage the SEAM products following an 'extensive search'. SEAM develops and markets terabyte-sized synthetic data sets covering a range of scenarios that are used to benchmark seismic processing software.

Petrobras has awarded **CGG** a four-year contract extension for the provision of a dedicated reservoir services center in Rio de Janeiro, Brazil. The CGG team of reservoir characterization specialists have been working with Petrobras for the last 15 years. Reservoir characterization workflows include geostatistical, 4D and azimuthal inversion and the new EBPetro and EBMatch ensemble-based petrophysical inversion and history matching, machine learning-augmented rock physics workflows/

SAExploration, a marine geophysical contractor has awarded Geospace Technologies a long-term, $12 million rental contract for the provision of OBX-750E wireless ocean bottom seismic recording nodes.

INT reports that ANPG, the Angolan regulator, has implemented a virtual data room solution on the IVAAP Cloud. The solution is reported as being a 'strategic tool' for the promotion of Angola's oil potential, to attract foreign investment and speed ANGP's digital transformation. More from INT. The virtual data room is operated by systems integrator SATEC and its local MIAPIA unit.

Novus Consulting and Datagration are to help operator Formentera Partners develop a data strategy and deploy an end-to-end upstream data platform. Datagration is to supply its PetroVisor platform and Unified Data Model. Novus brings data transformation, expertise, and consulting services to the table. The goal is to 'accelerate Formentera's analytics, artificial intelligence and machine learning initiatives'.

OPERATIONS

Industrial IoT intelligence solutions provider Flutura Business Solutions has signed a multi-year agreement with consultant Petrogenium USA to deliver integrated and digital projects, products and services. The pairing combines Petrogenium's oil and gas expertise with Flutura's AI-powered 'Cerebra' cognitive digital twin solution.

Innio Waukesha Gas Engines has teamed with Detechtion Technologies on a cloud-based solution that combines engine analytics with compressor monitoring and optimization technology. The solution promises a skid-mounted package providing remote asset insights and analysis across a fleet of installed natural gas engine and compressors leveraging Detechtion's diagnostics.

PIPELINE/MIDSTREAM

Accenture has deployed a 'proprietary database powered by artificial intelligence' at Colonial Pipeline to optimize electric use over CP's interstate pipeline system. Accenture's Utility Tracking System (UTS), comprises a database of approximately 30 million anonymized utility bills, collected over a 20 year period. UTS uses AI functionality in Accenture's SynOps platform to select power tariff options and make electricity rate-savings recommendations. Read the release here.

Robotic industrial process automation specialist **CruxOCM** has expanded implementation of its pipeline control room automation technology at Phillips 66. CruxOCM's pipeBOT automates control room functions, reducing operator fatigue.

EN Engineering's geographic information systems and data solutions team is collaborating with G2 Integrated Solutions' to combine technologies and capabilities. The partnership covers the Gas HCA Toolset, Liquids HCA Toolset, tank modeling, Emergency Flow Restriction Device modeling and PIMS ILI Data Integration Tools. Other offerings include the Turboroute Alignment Sheet Generator, RISK as a service and the Pipeline Data Management Tool. The collaboration will extend the capabilities of PODS 7 and UPDM to the new architecture, supporting turnkey GIS solutions.

Orbital Sidekick has been selected by Dallas-based Energy Transfer to monitor its assets in the Permian Basin through satellite technology. ET assets include over 120,000 miles of pipeline and related assets crossing 41 states. ET's Permian Basin assets will now be monitored for fugitive emissions by OSK's 'GHOSt' constellation of space-based hyperspectral sensors.

DOWNSTREAM

Implico is providing digital services to Ireland-headquartered DCC Energy at newly acquired retail sites in Luxembourg, DCC is linking 19 forecourts to its IT landscape. The new locations will run SAP SDM (Secondary Distribution Management) and the Implico's data services portfolio iGOS (Implico Global Operation Services). More in the release.

SOFTWARE/HARDWARE

Tangent Works is now a member of the Altair Partner Alliance. Altair users can now use the Tangent Information Modeler InstantML engine and TIM Studio cross-industry solutions for data analytics and predictive AI.

Oil India has selected Juniper Networks technology to upgrade its data center and campus networks. The Juniper IP fabric includes QFX51 and EX4300 series switches in a 'spine-leaf architecture' with EVPN-VXLAN at its core. Security is provided by Juniper's SRX4200 service gateways and software.

Altair and **Oracle** have teamed on an engineering and high-performance computing capacity in Oracle's cloud. Altair One now offers a fully managed private cloud with modeling and visualization software, solvers, and post-processing running on an Oracle 'bare-metal' cloud.

MISCELLANEOUS

Aramco and **Cognite** have launched CNTXT, a joint venture to support industrial digitalization in Saudi Arabia and the wider MENA region. CNTXT is Google Cloud's reseller for cloud solutions in Saudi and the exclusive reseller of Cognite Data Fusion in the MENA region. Google Cloud is also to launch a 'Center of Excellence' to provide training in the use of cloud technologies. (So much for Google's widely-reported reluctance to provide software to the oil and gas sector.)

Constellation Clearsight is to offer Voliro's 'flying robot' as a component of its expert inspection offering. The Voliro drone can fly 'effortlessly and steadily' and touch objects at any angle, allowing for remote non-destructive/ultrasonic testing and dry-film thickness measurement.

Norwegian energy service provider **Interwell** is upgrading its enterprise resource planning (ERP) and asset management software to the latest IFS Cloud solution and is also to deploy IFS' 'Customer Success' support framework.

Following the closure of Elemental Controls, MFE Inspection Solutions Canada has taken over as distributor for **Thermo Fisher Scientific**'s line of Niton XRF and LIBS analyzers. MFE provides non-destructive testing and other services.

Following its first subsea well completion operation using a remotely operated controls system (ROC) on the Ærfugl field, Aker BP has ordered two more systems from Optime Subsea. ROCs eliminates the need for the costly and heavy umbilical that runs from the topside to seabed to control the tubing hanger during completions of subsea wells. The new, second-generation ROCs come with a stand-alone communication system and novel 'PanPipe' universal landing string. Earlier this year Optime invested a 'three-figure NOK million' amount to build ten ROC systems.

RocketFrac Cleantech has deployed its EcoStim waterless well stimulation tool to reactivate a suspended natural gas well in Alberta. EcoStim frac jobs use a 'proprietary solid rocket propellant' in place of pumped water. *Light the blue touch paper and stand clear!*

Schlumberger OneSubsea (a SLB/Helix JV) and **Subsea 7** are to renew their global subsea integration alliance for deepwater developments for a further seven years. The alliance covers a combination of subsurface expertise, subsea production systems, processing systems, umbilical, risers and flowlines systems, and life-of-field services.

India's ONGC has selected Tachyus technology to optimize mature fields in India. Along with partner SK Oilfield, Tachyus and ONGC will deploy the Aqueon and Subsurface Back allocation modules on-premise.

Equinor has awarded **TechnipFMC** an integrated front end engineering and design (iFEED) study on its BM-C-33 project offshore Brazil. The deal includes an option to proceed with a direct award to TechnipFMC for the integrated engineering, procurement, construction and installation phase of the project.

Neptune Energy has awarded a five year contract extension to **TechnipFMC** for the performance of technical services in Norway, extending an earlier agreement. The work includes engineering, studies and technical services including installation work and operational support for Neptune's development projects and producing fields.

ESRI 2022 ENERGY RESOURCES GIS CONFERENCE

ArcGIS in Chevron's new digital platform and STAC data catalog. TotalEnergies' GAIA blends GIS and AI. Colonial Pipeline's earthquake notification system. Chevron's PODS-based pipeline digital twin. New data science tools from Esri. ExxonMobil SNOOP's on Houston campus.

Jill Miller and Steve Huerta introduced **Chevron**'s new digital platform, designed to rationalize multiple independent IT organizations and applications and improve data access. The new IT comprises six 'chapters', agile, software engineering, cyber security, data engineering, data science and cloud/infrastructure. A migration from on-prem to (Microsoft Azure) cloud-native is underway including an extensive Esri ArcGIS landscape. A (small) component of which is the OSDU geospatial consumption zone that provides map services to the OSDU environment. Access is provided from a virtualized desktop environment and data products are delivered from Chevron's common STAC data catalog, aka the spatio-temporal access catalog, a common language to describe geospatial information, so it can more easily be worked with, indexed and discovered.

Marco Terrazas presented **TotalEnergies** combined GIS and AI solution to estimate seismic uplift fees. Such fees are defined by contract and are payable if the date of entry into a new license or farm-in is posterior to the date of the contract signature. Total used ArcGIS pro to evaluate the spatial component of licenses and award dates. Total's in-house (with help from Google) developed GAIA AI tool was used to search the contract document corpus. While the approach might seem like using a sledgehammer to crack a nut, Terrazas reported that the pilot project was able to analyze thousands of documents and identified, in record time, 12 with uplift fees, resulting in 'a $2 million saving'.

Eric James (**Colonial Pipeline**) and Garima Vyas (LOGIC Solutions) presented an automated earthquake notification system for pipeline operations. The solution was developed to speed up emergency response to potential earthquake damage. Logic Solutions built a system that checks the USGS earthquake activity feed every minute, evaluating its magnitude and proximity to a line. In the event of a potential hazard, the appropriate field personnel are notified for follow-up. The solution leveraged the USGS GeoJSON RSS feed, matched with spatially-buffered pipeline geometries read from a UPDM database. Both the USGS catalog and Colonial's emergency operations procedures are now stored in UPDM tables. The solution combined Safe Software's FME toolset and ArcGIS Enterprise.

Paul Herrmann and Luke Hamlin presented **Chevron**'s pipeline GIS modernization program, which is to enable a 'high fidelity pipeline asset digital twin'. At the core of the system is a pipeline data management solution that spans Scada, GIS, SAP-PM, Aveva/FIP and more. PODS, the pipeline open data standard is described as the 'emerging standard' for pipeline data management in Chevron. Currently Chevron's pipeline solution runs in-house. The 'future' cloud-based solution will embed more Esri products (in particular Pipeline Referencing) along with tools from New Century Software and Cartopac. All running on the latest PODS 7 Spatial database in the Azure cloud.

Brady Cline and Mansour Raad unveiled **Esri**'s new data science-oriented tools which make up a 'comprehensive set of analytical methods and spatial algorithms for batch, interactive, real-time and scripted processing'. Esri's big data offering is described as 'cloud-native and Spark-native'. Apache Spark is a 'multi-language engine for executing data engineering, data science, and machine learning on single-node machines or clusters'. The multi-cloud solution covers various Spark environments provided by Databricks. A new ArcGIS Knowledge application adds graph analytics to ArcGIS and brings 'non-spatial' analytics into the mix. ArcGIS Velocity for real time data also got a plug.

In a plenary presentation Kyle Daughtry and Athicha Dhanormchitphong spoke of **ExxonMobil**'s new way of working in the face of the data tsunami. This is (or will be) an all-3D visualization-based approach dubbed 'SNOOP' for scanning next gen operational oil and gas platform. SNOOP was demoed with a virtual reality exploration of a digital twin of Exxon's Houston campus. Anticipated use cases include operator training and location-independent availability of subject matter expert. The solution is claimed to be 'future proof' and the plan is to keep data interoperable across business lines.

Also new at the show is a Demo Portal for the Esri petroleum User Group (PUG) which is to be updated based on user requests and activities.

More from the Esri events portal. These and other PUG presentations are available here. The 2022 European Energy Resources GIS Conference will be an in-person event in London in November.

GOING, GOING … GREEN!

2022 CCS State of the Art Report. Ecotec teams with Archrock on decarbonization challenges. CGG teams with NTNU on CCS/geohazard monitoring and forecasting. CCS Institute analyzes direct air capture and storage economics. Hyzon Motors's fuel cell systems for Schlumberger's drillers. US National Science Foundation's $14 million solicitation for 'Paleo perspectives on climate'. UK seismic NDR gets 132 terabyte upgrade. Flowserve to support Norway's 'open-source' CCS facility. P2 adds venting and flaring monitoring to Merrick suite. Project Canary teams with Quantum Energy Partners. Shell announces 'accelerate to zero' program. Williams announces GHG 'quantification, monitoring, reporting and verification' program for midstream.

The **Global CCS Institute** has just published its 2022 Technical Report on the State of the Art of Carbon Capture and Storage Technologies. The Report is a compendium of commercial CCS technologies from companies including (Capture) Aker, Honeywell, Saipem, Shell, (Storage) Dril-Quip and others. Companies proposing 'full value chain' solutions include Baker Hughes, Chevron, NOV and Schlumberger. The report has it that CCS is growing at an 'unprecedented' rate, and that the that the technology is 'ready topurchase today'. *Right, but at what price?*

Ecotec International has taken a minority stake in natural gas compression services provider Archrock. Ecotec provides a combination of cutting-edge instrumentation and software for accurate and directly measured emissions data, auditable by third-party organizations. The deal represents an expansion into the oil and gas industry where the parties are to 'help solve decarbonization challenges'.

CGG has joined Norway's Centre for Geophysical Forecasting, based at the Norwegian University of Science and Technology. CGG is to apply its seismic modelling and imaging expertise to the work of the consortium, with the development and field testing of a new subsurface imaging and monitoring system targeting the energy transition. Focus areas include carbon capture and storage and geohazard monitoring and forecasting.

The **Global CCS Institute** has also published an analysis of the Economics of Direct Air Capture and Storage said to be a 'focal point in climate mitigation'. The CCSI concludes that DACCS plays a unique role among technological climate mitigation options as it can function as a backstop technology, potentially avoiding climate disaster if other low-cost pathways are not realized. Low-cost DACCS, should it be realized, would reduce the total cost of decarbonization and meeting climate goals. However, 'the cost of DACCS is uncertain' and it needs a 'tailored policy' to drive down costs and assist in DACCS deployment. *In other words, it will be crazy expensive, don't hold your CO2-laden breath!*

Hyzon Motors is teaming with **Schlumberger** to reduce emissions in upstream oil and gas operations with power generated by its heavy duty fuel cell systems. The fuel cells will be offered as a green replacement for power generation at North American land drilling rigs. The technology will be offered as a component of Schlumberger's portfolio of Intelligent Power Management solutions with availability scheduled for Q4 2022.

The **US National Science Foundation** has issued Program Solicitation NSF 22-612 covering 'Paleo Perspectives on Present and Projected Climate (P4CLIMATE). Proposals from researchers are sought to 'improve understanding of processes, drivers, and feedbacks of climate variability at seasonal and regional scales' with reference to past climate variability and regional trends. Funding of $14 million per year is on the table.

Subsequent to UK's first ever carbon storage licensing round earlier this year, the **UK North Sea Transition Authority** has added some 132 terabytes of seismic data to its online National Data Repository, 'boosting the search for carbon storage sites, wind farm locations and' (oh yes, nearly forgot), 'potential hydrocarbon fields'. More in the release. The data has been made is said to be 'processing ready' thanks to pre-processing by Moveout Data.

Flowserve has been awarded a contract to provide control valves for a portion of Norway's first cross-border and 'open-source' carbon capture and storage facility. Flowserve will provide its Flowtop and Mark One control valves for the facility's onshore site in the Bergen region. CO2 will then be transported offshore and stored permanently below the seabed. Once completed (in 2024), the facility will have the ability to potentially store 'the equivalent of 1,000 years of Norwegian emissions'. More from Flowserve.

P2 has upgraded its Merrick suite to align its data capture and reporting functions with the New Mexico Energy, Minerals and Natural Resources Department's Oil Conservation Commission's (OCC) July 2020 rule that regulates the venting and flaring of natural gas from wells, production equipment, and facilities. More from P2 Merrick.

Project Canary has entered a strategic arrangement with Quantum Energy Partners to improve ESG performance across the energy industry. The collaboration combines Quantum's sustainability-linked investment initiatives and Project Canary's 'ESG 2.0' emissions monitoring solutions.

Shell Fleet Solutions has announced a new Accelerate to Zero program to drive Shell's customers' fleet decarbonization. The offering combines consultancy, mobility solutions and industry know-how in support of 'net-zero emissions journeys'.

Williams is to collaborate with **Cheniere Energy** and other natural gas midstream companies, methane detection technology providers and academic institutions to implement quantification, monitoring, reporting and verification of greenhouse gas emissions at natural gas gathering, processing, transmission, and storage systems. This collaboration with Cheniere will improve the overall understanding of GHG emissions and further the deployment of monitoring technologies and protocols to enhance clean energy supply and delivery for Williams and its customers. More in the release.

OSDU FORUM MOOTS OPERATIONS WINDFARM SERVICE

OSDU scope creeps to wind, solar, hydrogen and 'other' new energy solutions. Wind power data currently 'problematically siloed' by OEM secrecy.

David Smith (**Baker Hughes**) reported recently on a planned extension to the OSDU Forum's scope, a new Operations Windfarm Service (OWS) running on the OSDU platform. OSDU's planned new energy projects include wind, solar, hydrogen and other emerging energy solutions. The OSDU data models that support oil and gas assets, like wellbores, are to be extended to support wind turbines and photovoltaics.

First out of the starting blocks is wind power where OSDU's work with real-time data streams, OPC-UA and other workstreams including drilling and wells interoperability offers potential synergies.

Smith argues that an early start to addressing the challenges of wind power data is needed as this is 'problematically siloed' due to cost and technology challenges and OEM secrecy. The OWS will provide visibility of operations and equipment health, KPIs for tracking productivity and costs and data for forecasting weather events and equipment issues.

During OWS due diligence, OSDU champion Johan Krebbers interviewed wind players including Siemens, Schneider Electric and Emerson for observations on data standards. Intel, Baker Hughes' Bentley Nevada, Vestas, Equinor and Wipro also provided feedback. The US National Renewable Energy Laboratory (NREL) politely pointed the group in the direction of prior art in the form of Open-OA and the open wind data standards of the ENTR Alliance. Another 'major finding' of the discovery phase was the widespread use of IEC standards for electrical systems.

All of which was unlikely to derail the OSDU team's headlong scope creep. As is often said in the standards world. Standards are like toothbrushes, everyone has their own and nobody wants to use anyone else's. Other partners in the OWS crime include BP, Equinor and TotalEnergies. An initial POC is under development by EnergyVue and Prediktor with an MVP1 to follow real soon now. The project is to be presented at the upcoming ECIM conference in Haugesund, Norway.

More from the OSDU Windfarm Project home page.

DONE DEALS

ABL Group acquires Add Energy. Agile Scientific to close. CCI bags Hargreaves Jones. CGI buys Umanis. Cathedral Energy Services closes Altitude Energy Partners acquisition. EIG signs MOU with Aramco. Helix has acquired Alliance Group's interests in GoM decommissioning. ProFrac to acquire US Well Services. Troubled Recon Technology provides update. SCF Partners invests in T.D. Williamson. Sercel 'successful bidder' for ION's software business. Stanley Black & Decker sells oil and gas business.

ABL Group ASA is to acquire energy and engineering consultancy Add Energy, adding expertise in operations, digital optimization, carbon storage and energy efficiency to its service offering. The deal adds some 140 consultants to the group's global team.

Matt Hall has decided to close Agile Scientific following '12 years of consulting, teaching, writing, and hacking'. Hall is taking a position as software developer with Equinor where he will be contributing to Equinor's 'inspiring' open source software program. Agile's Software Underground community of digital subsurface professionals lives on.

Capital Consulting International (a Rimkus unit) has acquired Manchester, UK-based Hargreaves Jones, a commercial and project management consultancy serving the oil and gas and other verticals. The acquisition progresses CCi's offering in commercial and project management services to clients engaged in construction and engineering activities on infrastructure projects.

Toronto-headquartered **CGI** is in the process of acquiring **Umanis**, a French provider of data, digital and business solutions in a €310 million transaction. Digital transformation specialist Umanis' 3,000 consultants work in big data and AI, infrastructure and cloud and BPO, leveraging methodologies including 'DevSecOps', at-scale Agile and 'Think, build run' in energy and other sectors.

Cathedral Energy Services has closed its acquisition of Altitude Energy Partners for a total consideration of approximately $100 million. The acquisition positions Cathedral as a leading independent directional drilling company in the and adds rotary steerable technology to its portfolio.

Global institutional energy and infrastructure investor **EIG** has signed a memorandum of understanding with **Aramco** to collaborate on future energy projects. The MoU targets existing and new technologies such as alternative fuels, carbon capture, hydrogen and natural gas, transportation, and energy storage. The agreement follows last year's $12.4 billion investment from an international consortium led by EIG, involving the lease and leaseback of oil pipeline infrastructure from Aramco.

Helix Energy Solutions has acquired all of the equity interests of the Alliance group of companies expanding its decommissioning presence in the Gulf of Mexico and 'advancing Helix's environmental, social and governance initiatives by responsibly supporting end-of-life requirements of oil and gas projects'.

ProFrac Holding Corp. is to acquire US Well Services in a stock-for-stock transaction. The deal expands ProFrac's fleet to 44 active units including electric, dual fuel and diesel fleets. The combined company is will the largest provider of electric frac services with 12 electric fleets. The deal represents an 'aggregate stock consideration' of approximately $93 million.

Troubled Chinese oil field service company Recon Technology has provided an update to investors. Recon is China's first NASDAQ-listed non-state owned oil and gas field service company. Earlier this year, president Yongquan Bi resigned and the share price sunk below one dollar. Thanks to a rising oil price the company reports ongoing revenue growth and expects to achieve 'an average annual growth rate of 30% in the next three fiscal years'.

Energy-focused private equity unit **SCF Partners** have invested in pipeline maintenance and integrity specialist T.D. Williamson. The deal combines TDW's brand and technology with SCF's 'deep' financial and strategic expertise.

The US bankruptcy court has selected CGG's **Sercel** equipment manufacturing unit as the 'successful bidder' for the acquisition of ION Geophysical Corp.'s software business. The acquisition is expected to close in the third or fourth quarter of 2022.

Stanley Black & Decker is selling its oil and gas business to Pipeline Technique International. The deal covers Stanley's pipeline services and equipment businesses including CRC-Evans Pipeline, Pipeline Induction Heat Ltd. and Stanley Inspection, all of which generated revenues of approximately $140 million in 2021. As a result of the sale, Stanley expects a charge of approximately $125 to $200 million relating to the write-down its oil and gas net assets.

STANDARDS STUFF

EFRAG's proof-of concept taxonomy for sustainability reporting. Energistics 'up and running' at The Open Group, V2.3 'common' released. IOGP RP for pore pressure and fracture gradient analysis. Open Footprint Forum update. Metaverse Standards Forum launch. OGC GeoRSS test suite, MoU with OSGeo. Upstream Development and Engineering joins CO-LaN. World Wide Web Consortium reforms as 'public-interest non-profit'.

European Financial Reporting Advisory Group (EFRAG) has released a proof-of concept XBRL Taxonomy in support of the European Sustainability Reporting Standards, providing the digital definitions needed for selected climate-related disclosure requirements. More from EFRAG.

The **Energistics Consortium** is 'up and running' under the ownership of The Open Group. Ongoing standards development is planned, led, and implemented by Consortium members and facilitated by TOG staff and IT infrastructure. The Consortium has just released a bumper 'Omnibus' release of its data transfer standards. The latest versions of WITSML, PRODML and RESQML now available for download. The Omnibus edition includes V2.3 of Energistics Common, a of data objects shared by across the Energistics standards. The Common Technical Architecture has been updated with Energistics Identifier Specification V5.0 and Energistics Packaging Convention V1.1. More from Energistics.

The **IOGP** has released a new Recommended Practice for pore pressure and fracture gradient analysis (PPFG) for well design, construction, intervention, and abandonment. The guidance document defines a shared language for subsurface and drilling specialists and provides a globally applicable recommended practice for the preparation of PPFG predictions, the definition and communication of associated risks, and uncertainties, and real-time PPFG monitoring. IOGP Report 608 is a free download from the IOGP library.

Following an enquiry into progress by Oil IT Journal, The Open Footprint Forum (OFP) forum kindly provided the following information. 'Thanks for reaching out and your inquiry on the status of the Open Footprint Forum projects. The MVP2 is under development. MVP1 is being tested.' OFP has also published a FAQ where we learn that 1) OFP does not use blockchain. 2) OFP is working closely with the Geneva-based World Business Council for Sustainable Development, 3) OFP is Open Sourced on an Apache 2.0 License 2.0. 4) OFP is in contact with OSClimate with a view to cooperation. 5) OFP will support data loading using formats including Manifest, CSV and OPC-UA.

The grandly-titled and massively scoped 'Metaverse Standards Forum' has just launched to 'explore where the lack of interoperability is holding back metaverse deployment' and how standards bodies can help out. Members include the World Wide Web Consortium, the Open Geospatial Consortium, the Open AR Cloud, the Spatial Web Foundation, and many others. But not Facebook! Oil and gas industry old-timers will appreciate MSF support from the EXPRESS Language Foundation. The MSF is hosted by the Khronos Group which appears to be responsible for the Forum's privacy policy, which incidentally includes accepting cookies from Facebook!

The **Open Geospatial Consortium**'s Executable Test Suite for GeoRSS has been approved by the OGC Membership. GeoRSS is 'a lightweight, community-driven way to extend existing syndication feeds with simple geographic information' The standard is embedded in Esri's Geoportal Server and in the pycsw metadata catalog server.

OGC also recently signed a memorandum of understanding with **OSGeo** marking a 'significant milestone' and framework for increased OSGeo participation and interoperability in FOSS4G.

Oil and gas processing plant design and engineering services provider Upstream Development and Engineering has joined the **CO-LaN** standards body.

The **World Wide Web Consortium** is mutating from its original 'hosted' legal model and is to become a 'public-interest non-profit organization', 'elevating W3C to a level where it rises up stronger'. More on this tortuous turn of events in the release.

AUTONOMOUS OPERATIONS IN OIL AND GAS

ExxonMobil on high availability edge computing at ARC Forum. NAMUR group push for automation in face of 'major decimation of personnel'. NL WIB and the Autonomous Operation Maturity Matrix.

Two recent events address autonomous operations in the process industries including oil and gas from very different standpoints and granularities. **ExxonMobil** unveiled its work with on high availability edge computing at the 2022 ARC Advisory Group Industry Forum. On the other side of the pond, the EU Namur standards body has published a summary of its 'WG Praxis' work on 'Remote or autonomous operation projects' that approaches the field of autonomous operations from a business and management of change perspective.

At the ARC event, Steve Bitar and David Hedge presented **ExxonMobil**'s 'journey towards autonomous operations' and high-availability edge computing. Today's control systems are 'great' but they are not up to autonomous operations. 'We need a next generation platform!' This should include interoperable and portable software components and interchangeable edge devices, probably leveraging something like the EU 'FOCI' Far edge open computing interface standard*. The fundamental problem is the management of parallel information paths across a distributed control system that may vehicle contradicting data. Rogue processes may send inconsistent messages that cause system failure. ExxonMobil's approach is to deploy middleware in process control and is investigating the use of the Data Distribution Service (DDS). DDS from the Object Management Group provides a communications middleware layer that includes publish and subscribe communications and a quality of services capability. Adlink**, a commercial provider of DDS solutions, got a shout out. Bitar showed how the middleware supports subscriber-based voting with time-gated polls and offers a better way of selecting the data from conflicting inputs. Exxon's real-world hardware tests have shown that sub-second synchronization is possible with the broker-less middleware. The trial spanned various Intel and ARM architectures operating independently. The approach has application in control, optimization and HMI. Exxon is now working to scale up the middleware approach to fault tolerance, extending application-based voting to device-based voting. Watch the presentation here.

** FOCI Factory Automation Edge Computing Operating System Reference Implementation ... 'Where Factory automation meets edge computing and blockchain technology'.*

*** Adlink was formerly PrismTech, a Shell spin-out that set out to develop business objects for E&P. It's a small world!*

Meanwhile, the EU **Namur** standards body has produced an investigation into autonomous operations, co-authored by Shell's Jacco Opmeer. This, the latest publication from the Namur Work Group 4.2, is termed a Praxis document and as such, offers guidance on the practical aspects of centralized operation of globally distributed plants and/or semi-autonomous operation with reduced staff due to automation and 'even largely unmanned operations'. The Namur push for automation stems from the anticipated 'major decimation of personnel due to retirement', the shortage of skilled labor and safety considerations. Reducing on site personnel is considered a safety goal.

The Groningen gas field is cited as an early example of autonomous operations. The field was a major provider of natural gas to Western Europe. Compression was installed in the later years of the field as meeting the hourly gas demand as timely and accurately as possible became more challenging. In 2002 the operator NAM (a Shell/ExxonMobil joint venture) updated the field's control systems to reduce manning and emissions, maximize capacity and cut operating costs. This was achieved by deploying independent safety instrumented systems on every installation. When a facility developed a problem it could be shut down remotely from the field-wide distributed control system. The system automatically delivered the hourly nominated gas flow by a combination of automatically opening and closing wells and stopping and starting compressors on the 23 gas plants that make up the Groningen Field.

The complex interplay between autonomous operations and people was illustrated with one project that envisioned sending alarms to the plant operator's mobile phone. This had to be rejected as it would have 'disrupted the mandatory 11-hour resting period'. Instead, the plant was automatically shut down in case of an alarm (presumably until the operator woke up!). In the end the plant deployed more gas sensors for leak detection and revised its shutdown procedures.

The Namur report concludes with a reference to the Autonomous Operation Maturity Matrix from Netherlands-based standards body WIB. The Matrix provides insight into 'states, enablers, and transitions towards next levels of autonomous operations'. The maturity matrix was inspired by the maturity definition from ARC (see above) and has been redefined, refined, and extended by the WIB Autonomous Operations Working Group's Autonomous Operations Maturity Document.

SAP OIL & GAS EUROPE

Shell-SAP Sustainability Alliance. Chevron's Digital Core, Celonis and Prometheus. GreenToken by SAP: blockchain for supply chain visibility. BASF 'SCOTT' and the GHG Protocol. Shell, Utopia on NextGen ERP. SAP, Siemens PLM joint venture. Aker BP's journey to S4/ HANA. SAP Cloud for Field Logistics.

Audny van Helden (**Shell**) argued that the evolving energy scene means that digital technology is necessary to optimize diverse energy sources and usages. With regards to the energy transition, 'the world is not moving fast enough to reach 1.5°'. Shell is doing its part and has joined the UN's Race to Zero campaign and is to be a Net Zero company by 2050. The Climate Ambition Alliance also got a mention. van Helden introduced the Shell-SAP Sustainability Alliance, a 'catalyst for accelerated decarbonization'. This is to be achieved by 'advancing standards and transparency in GHG emissions' and by providing digital solutions to drive sustainable business practices. Shell and SAP are to co-innovate on greenhouse gas emissions accounting solutions and supply chain management practices. The Alliance will 'bring standards to life' with (GHG) data for transparency and performance benchmarking. Such benchmarks will be translated into action through sector-specific decarbonization interventions and shared know-how, services and ultimately, products accessed through an (open) network. More on the Alliance here. van Helden also mentioned the Open Footprint Forum of which Shell is a founding member and where 'we are working together to create a common model for footprint-related data covering all emission types, consumption, and base calculations to normalize and aggregate industry data'.

For an independent (?) assessment of Shell's (and others') progress in decarbonizing visit the ClimateAction100 website.

David Slack presented **Chevron**'s 'Digital Core' strategy and the advent of a cloud-based SAP S4/HANA system. Chevron's current situation is deploys 'overly complex enterprise technologies that are slow to update, function on disconnected data and widely varying processes'. The aim is to replace these with a streamlined digital foundation using the cloud-based SAP S4/HANA system with core, common data and

processes. The new system will replaces 11 existing ERP systems and add new capabilities like mobility and a modern user interface. The Digital Core will standardize business processes, data and technology at the enterprise, segment and business unit levels. Last year the situation was evaluated using Celonis process mining to identify improvement opportunities. Prometheus scheduling, a web-based visual scheduler for planning and maintenance was also selected as providing a connection to Maximo. Release 1 is scheduled for delivery in 2023 and will include some 92 SAP processes and leverage an equipment master data cleansed to a new Chevron enterprise data standard (ISO14224). Ultimately, R3/4 (2026 on) will embed 488 SAP processes across up, mid and downstream. The development involves juggling between SAP-standard functionality and Chevron-specific developments with regular Chevron and SAP meetings en route! The approach is to adopt industry standard business processes as a first choice, then 'drive innovation' with the engagement of SAP product teams and customer groups. Further down the line the expectation is that Chevron-specific extensions will integrate the standard product roadmap, 'intercepting the future (SAP) standard'. Slack concluded that 'there is no S/4 out-of-the-box playbook available either from a system integrator or from SAP on executing a fit-to-standard/detailed design'. Chevron advises including SAP as part of the project team to address process gaps in the S/4 roadmap and to advise on complex design and alignment. A focus on oil and gas data standards is also key along with data governance and data management best practices. Chevron has developed a data object map defining ownership, business rules, data hierarchy and metrics. The project leveraged a Scaled/Agile approach, although Slack described adopting this framework as 'hard'.

James Veale, founder of GreenToken* observed that companies do not have visibility into the origin of materials and the extent they are truly sustainable. Traceability for (continuously) commingled and bulk-traded materials requires a novel approaches. Keeping track of mass balance at scale is onerous because of product conversions, yield losses and multiple locations. Reporting needs for certification standards like ISCC are complex and time consuming. Enter GreenToken, both a SaaS-based network solution for end-to-end traceability and a stand-alone tool for mass balance accounting and certification. The solution leverages an immutable blockchain of custody across multiple business partners. More in the White Paper. Veale reported take up in chemicals from BASF, Eastman, Mitsubishi and others.

** GreenToken, officially GreenToken by SAP was founded when SAP opened up its SAP.io venture capital arm to internal employees. Veales's team applied for funding in 2019 with a 'ComTrace' proposal out of which GreenToken was born.We naturally challenged Veale on the pertinence of blockchain in the supply chain which resulted an fruitful email exchange which we will report on in our next issue.*

Peter Saling and Alessandro Pistillo presented on **BASF**'s approach to emissions tracking. The ISO 14067:2018 standard defines the Product Carbon Footprint (PCF) as the life cycle GHG emissions of a product, further leveraging ISO14040:2006 and 14044:2006 life cycle assessment standards. The GHG Protocol Product Standard from the World Resources Institute also ran. From these BASF has developed a digital solution to determine PCFs 'at scale'. The solution uses primary source data rather than industry averages or benchmarks. BASF has leveraged a 'a wealth of LCA expertise' to calculate PCF in an 'efficient, automatic and consistent fashion'. All of which has been embedded in the Strategic CO2Transparency Tool. SCOTT provides cradle-to-gate PCFs using an open shared methodology developed for the TfS1 Together for Sustainability consortium . While developing the methodology, BASF noted that upstream inputs to the chemicals industry, in particular crude oil emission factors were in need of improvement. Currently these are 'very uncertain' and probably too low by a factor of 2-3 times. Flaring, venting, transports, spills etc. 'are not well addressed'. 'Reliable, updated and meaningful data for energy and feedstock production are needed as key element of PCF calculation of chemicals leading to GHG reductions in the supply chain'. There is an urgent need for high quality, detailed, primary data for oil, gas and refinery products and processes. A 'call to action' was issues to oils to generate and provide these data!

BASF's SCOTT was a winner in the 2021 Cefic Responsible Care Awards 2021 in Category 3: 'En route to climate neutrality'. The team got a pat on the back from Martin Brudermüller, Cefic President and CEO of … BASF. Incidentally there was no mention of GreenToken or the Open Footprint Forum.

Evert Ruijs presented **Shell**'s NextGen ERP upstream/integrated gas 'asset digital core' along with Peter Aynsley-Hartwell (Utopia Global). The project involved the addition of master data governance to Shell's 'Asset Digital Core'. MDM is designed to eliminate duplicate data entry, manual handling and custom scripts and different practices across the ERP landscape. The vision is for data governance best practices enabled by 'out of the box' automation. Critical data will be supported by SAP MDG. MDG-EAM from Utopia was also selected as part of the landscape. Utopia's approach to data is 'get it clean and keep it clean'. Asset data is extracted from legacy systems, documents and drawings, cleansed and enriched with ISO 14224-compliant asset data. MRO spare parts is the first priority. The SAP Asset Information Workbench (also from Utopia) also ran. Once a complete set of asset master data has been loaded, the system will be used to synchronize engineering and S/4 asset master data during ongoing plant modifications. OpenText Extended ECM for Engineering and the SAP Asset Intelligence Network are also involved.

SAP's Hisham Gouda reported that productivity in manufacturing was up 70% in the period 1995 to 2011 (*time to refresh the data?*). In construction productivity remained flat. The lessons learned in product lifecycle management (PLM) are now to be applied to construction. The missing piece of the puzzle was an IT system for Capital Projects. This is now being rectified with a joint venture between SAP and Siemens which will see Siemen's PLM hooked up to the SAP digital twin. Construction design and build will leverage Siemens Teamcenter for capital asset lifecycle management and on handover, operations will transfer to SAP which 'manages the entire asset lifecycle from creation to decommissioning'. A digital handover process promises 'quick and traceable' digital issue management, providing visibility and metrics of build progress. CFIHOS got a mention.More in the 2021 press release.

Yngve Karlsen described **Aker BP**'s journey to SAP S/4 HANA. This was a big program to replace multiple legacy systems acquired during mergers. One issue was that standard SAP data forms proved hard to use by field workers. These have been replaced with simplified GUIs and a dedicated app for approvals of invoices, requisitions and PO's. Only relevant information shown to the end users and the interface offers approve, reject or forward buttons only. Another app has been developed for requisitioning with logic implemented to avoid 'unwanted' purchases. This has resulted in happy users and less time spent on support and administration. Inspired by these developments, Aker BP users realized that there was potential for improvement in other processes with missing functionality bridged by custom apps. Expensive side systems and add-ons are being replaced by customized Fiori apps. Aker BP is now planning to replace extensive Excel usage with Fiori applications to standardize processes and improve data quality. Overall the goal is to offer a modern GUI that give the information the user needs to perform a task and reduces clutter. Data quality is improved by removing options that do not follow the process. The only drawback is that experienced SAP GUI users are hard to bring into the new world.

Stephane Lauzon (**SAP**) presented the SAP Cloud for Field Logistics. This was developed with input from the SAP Upstream Oil and Gas Consortium, a user group that includes BP, Chevron, Equinor, Inpex, Repsol and Shell. The Consortium is the custodian of the 'market-standard scope' (of SAP), reviewing innovation priorities and acting as early adopters of new cloud services. Of which, the Field Logistics offering is currently at 'Labs Preview' stage and is subject to change. FL provides support for field work orchestration and automation, and is Fiori-enabled for use with mobile devices. The system scans and tracks non-stock, rental and third party items and covers returns process and tracking. A machine learning function provides container ID/OCR recognition. BlueOpex by IntCom got a plug, as a 'people/logistics solution for assembling teams and planning shifts'.

Next year's TA Cook/SAP International SAP Conference for Oil, Gas and Energy will be held from 18–20 April 2023 in Basel, Switzerland.

USPI NL 2022 MANAGEMENT BOARD MEETING

Netherlands process engineering standards body hears form Shell on ISO 19008 cost code standard. Pernis refinery decarbonization and RED II, the green engineering digital twin. McDermott and Technip on flagging support for CFIHOS engineering data standard. Shell/USPI propose new equipment tagging standard. FL3DMS, the Facility Lifecycle 3D Model Standard update.

Anders Thostrup (**Shell** and **USPI-NL**) bravely announced that the 2022 USPI-NL member meeting would address 'what's really happening in the data standardization landscape and what can be used'. Next Ferry Zollner revealed that **Shell** has over 200 tools working on project data which use different definitions, making data comparison difficult. Shell is currently working with ISO 19008* a 'standard cost coding system for oil and gas production and processing facilities'. This is a faceted system that offers a granular control of costs as part of continuous improvement of capital efficiency. Facets (dimensions) can be the costs as assigned to physical assets, activities or project resources. The standard is said to provide a basis for project lifecycle data structuring and analysis with a comprehensive scope of application from exploration to decommissioning.

** A snip at 58 Swiss Francs!*

Mark den Boer and Jerome Jemmotte (both with **Shell**) presented the Pernis 'opportunity' to decarbonize the largest refinery in the EU. This involves the construction of a Green Engineering Digital Twin, an advanced work package in the EU RED II initiative. RED II is the 'recast' (i.e. delayed) version of the EU's Renewable Energy Directive which envisages a 32% target for renewable fuels in the EU by 2030. Shell's Pernis project envisages the production of 820k tonnes per year of renewable hydrocarbons and sustainable aviation fuel and a connection with the Rotterdam Porthos CCS facility. A cloud-based commercial package (which supplier was not divulged) will support piping design in what appears to be a PDF-based application.

A joint presentation from John Leeflang (**McDermott**) and Jean-Luc Hoffert (**Technip**) discussed data standards implementation with reference to CFIHOS (originally developed at USPI-NL) and the proposed FL3DMS 3D data standard. The pair promised a viewpoint 'from the engineering community'. The engineering standards landscape is 'vast and bewildering'. The ISO standards (15926 et al) are hard to implement and have a tendency to proliferate. Folks tend to develop one more 'standard' rather than use what is there! Currently standards (like CFIHOS) are defined and implementable but often lack policy requirements, verification and compliance metrics. They need more support and an enforcement policy. The EPC is not in a great position to achieve this with its focus on project, as opposed to data, delivery. The result is that while CFIHOS is in a 'steady state' there is 'no evidence of significant adoption across the client landscape'. This is 'eroding confidence from EPC senior executives regarding funding further development'. At the technology layer, while some data management tools can export CFIHOS data none do import. Connecting engineering tools to CFIHOS is challenging. EPC's are 'burning many man hours on this' at a time when budgets are 'under attack'. It will be hard to continue without concrete results from projects. On the other hand, building information management standards like ISO 19650 are growing in visibility and encroaching on energy use cases*. CFIHOS rep peter Townsend (IOGP) offered a defense of the initiative stating that the IOGP (current 'owner' of CFIHOS) is working on training, awareness and measuring adoption. Marketing is another focus area. Townsend acknowledged the 'invaluable' feedback both for CFIHOS and for the owner operators who are driving the initiative.

** This observation recalls the manner in which Fiatech, the US engineering and construction standards body, was subsumed into CII, the (building) Construction Industry Institute back in 2017.*

Anders Thostrup (**Shell** and **USPI-NL**) presented a proposal for a new equipment tagging standard. Owner operators all have their own standards, a situation Thostrup qualifies as 'ridiculous'. Agreement is needed on what to tag and how. The advent of the digital twin and digital MRO systems argues for standard tags at the granularity of pumps, motors and civil structures (flanges). The USPI-NL proposal is for a set of minimum tagging requirements derived from current owner operator specs. More from USPI-NL.

Martin te Lintelo (**USPI-NL**) reported from the FL3DMS project that kicked-off in 2020. FL3DMS, the Facility Lifecycle 3D Model Standard. Release 1.0 was delivered late 2021. The team is now working to demonstrate the business case for the 3D model and to persuade more owner operators to maintain their models throughout the asset lifecycle. For an update on FL3DMS visit the June 2022 workshop page.

More from USPI-NL and CFIHOS/IOGP.

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