

When will the oil run out? Never!

Editor Neil McNaughton, inspired by BP Group chief economist Spencer Dale, looks to the end of the oil age. Oil and gas is never going to 'run out.' But can shale really act as a price regulating mechanism? Fast ramp up of production requires finance which may not be forthcoming next time around. Rapid decline does not benefit the holders of junk bonds! And then there is COP21...

In his [presentation](#) to the Society of business economists annual conference in London last month, Spencer Dale, BP Group chief economist, questioned one of the tenets of the oil industry – that '*Oil is an exhaustible resource and that it will eventually run out.*' Dale argued that growing concerns of carbon emissions and climate change mean that it is 'unlikely that the world's reserves of oil will ever be exhausted.'

I agree, but I don't think that you have to invoke concerns over global warming to reach the same conclusion. In our September 2002 issue we heard Shell researcher Michiel Groeneveld observe that fossil fuels '*have proved far more abundant than previously thought*' and that was before shale! In a throwaway remark, Groeneveld added that the 'oil age' will not end because we run out of oil, no more than the Stone Age ended because we ran out of rocks!

So how did the Stone Age end? In so far as stone is still in widespread use, it never really did 'end.' Instead, stone got downgraded as a primary source of almost everything as it was replaced by bronze, then iron and so on. Humanity had learned the magic of substitution!

Today, stone is still in widespread use. A metric tonne of decent rock is worth around \$100 to those who build roads and railways. There is an awful lot of rock *ordinaire* in the Paris basin, where I live, whose notional value exceeds the world's annual GDP many times over! Rock has value, but (as far as I know) it does not have a huge cohort of entrepreneurs and geologists chasing around looking for more of the stuff.

Everyone knows where rock is. Back in the day, the Romans quarried rock from beneath Paris itself, leaving underground 'catacombs' that you can visit now. This practice stopped when its 'social acceptability' was questioned by those living in large sections of the city that were collapsing into the holes.

Shale has further demonstrated that the oil and gas business will not end because of a lack of oil. The paradigm shift from localized oil or gas 'fields' to basin wide targets for 'factory drilling' means that at any time in the future, there will remain

huge reserves of oil and gas (just as there are huge reserves of rock), that are too deep, not 'sweet' enough, too far away or inaccessible in other ways to make them exploitable.

Oil and gas are never going to 'run out.' Before we are looking for ways to extract ultra-deep shale oil from the world's basins at a cost of thousands of dollars per barrel, substitution by renewables or perhaps by coal will take place*. If that does not convince you, think of thousand meter deep tar sands, deepwater methane hydrates or offshore oil shale which must be off the scale in exploitability but which are probably in somebody's reserves estimate someplace.

So next time you read about how much oil there is left (a trillion or so barrels is a popular number) reflect on how much 'regular rock' there is left and how unexciting is the 'economic potential' of zillions of cubic kilometers of the stuff.

Dale made another point with which I am less in agreement. He stated that shale has changed the economics of the industry in that, compared to conventional oil and gas, shale is quick to bring into production but that its production declines quickly.

Dale concludes from this that '*As prices recover, investment and production can be increased quickly. As prices fall, supply will decline, mitigating the fall in oil prices.*' I think that this is a specious argument on both counts.

It has to be said, it takes an economist to find virtue in a high decline rate! It is unlikely that the 'dentists of Chicago' will be so enthusiastic when they are asked for another contribution to the next round of fracking frenzy. Imagine the sales pitch, 'Just buy our junk bonds at 10% and wait till that 75% decline rate kicks in and saves the day for Opec!'

Dale implicitly recognizes this when he says, '*It seems quite likely that the scale of funding that enabled the US shale revolution to expand at the pace it did over the past 4 or 5 years would not have been available [without] central banks' quantitative easing encouraging investment in riskier assets.*'


So, when the oil age 'ends,' there will be lots of the stuff left. What happens in the

interim depends on externalities like wars, the acceptability of nuclear generation, COP21 considerations and the cost of renewables. In the interim, worldwide oil 'reserves' will come and go. Shale 'spots' will sweeten and sour. Deep offshore will be on and off the agenda. Folks who build massive LNG terminals will look stupid or smart. When we ask 'how much oil is left?' we are asking the wrong question.

The right question should be something along the lines of the ones that the SEC asks oil and gas companies in their reserves reporting. As you can see from our summary of the Ryder Scott reserves conference (page 5), this has become a very touchy subject in the current climate, involving considerations of hedging, junk finance and ethics.

The other question, when will the oil age 'end' is a complete imponderable. The industry (including myself) would like to see it go on for a while. A lot may depend on the outcome of COP21 which I propose to discuss next month along with a report from the 'sustainability' session at the SPE. Meanwhile you can read about the parlous state of what seems now like the 'ugly sister' of sustainability, carbon capture and sequestration, in our report from CATO2 on page 7 of this issue.

** But don't think of 'King Coal' as being cheap forever. It suffers from all the same issues as oil, gas and ... rock!*

 @neilmcn

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Interview - Ross Philo, Energistics CEO

Energistics' CEO's message is that standards can drive out 'data friction' and cut costs. But how is this going down in the current climate of belt tightening? Philo is out to convince the industry that increased efficiencies easily justify membership and will help keep subject matter expertise alive.

How is Energistics holding up in the current climate?

Energistics recognizes the pressure on companies to cut costs following the rapid decline in the oil price mid 2014. Our message is that, at times like this, Energistics' standards can help drive out data friction and reduce the cost of operating.

How is the message being received?

It is resonating with some. Others may see membership as unnecessary. We are very grateful to those individuals who defend the use of standards as a component of industry leadership. Companies can't work efficiently with proprietary technology.

Who is defending the cause, oils or service companies?

We have broad cross industry support from 110 member companies, including all but one of the super majors, many independents and NOCs, the major service companies, systems integrators, developers and regulators. Membership also confers structure and recognition.

But the support – is that mostly from the majors?

Support from the majors is of course critical. But this is a symbiotic relationship as majors use both internal resources and external partners. For service companies, standards allow for competition without having to support a myriad of different formats. The trusted data that results is in the interest of industry and eliminates lost time and inefficiencies.

We see Witsml as having significant take-up in Energistics line-up with Prodml and Resqml as having yet to prove their worth. Is this fair?

Energistics does nothing in a vacuum. What we produce is done by and for the industry. Projects are run by special interest groups and the work is done by members who are passionate about data standards. These folks know what they need and work for compromise in a non-competitive environment. Energistics' role is to lead and steer the SIGs and when a standard is agreed, to publish and evangelize. For sure, Witsml has the largest penetration today. It is also the oldest, Witsml predates Energistics. Witsml has the biggest penetration because

it is the most straightforward to implement. Prodml is the most comprehensive and complex, with data objects across the whole environment. It is a 'soup to nuts' solution. Resqml is used to move earth models between different interpretation systems and has many potential uses.

Such as?

Total is using Resqml to move earth model data from structural modeling through facies analysis, petrophysics and on to gridding. Resqml is Total's data transfer mechanism of choice in its interpretation workflow. And one other supermajor is using Resqml to capture and archive interpretations made with legacy systems for long term archival.

What is your relationship with PPDM these days?

Very good. We have established the division of labors as follows. PPDM handles data at rest and we do data in motion. PPDM is also looking at professional development requirements.

Actually the archival example you gave above sounds like data at rest to me...

OK but we really are focused on the I/O side of the equation – which we see as data in motion.

And the Standards Leadership Council, is that still alive?

Very much so! The SLC has a coordinating role – it does not have any additional budget and there are no separately-funded projects. The idea is to help member bodies plug perceived gaps in coverage and avoid overlap. We also avoid 'Energistics vs. PPDM' conflicts via conversations at the SLC level.

What overlaps have been avoided?

Our units of measure work has been adopted by PPDM to make its stuff more consistent. We have also collaborated on a raster log object, now part of Witsml.

What of seismic standards?

Energistics does not do seismics which is owned by the SEG, itself a member of the SLC. There was a MicroseismicML project but this is standing fallow at the present time. We are waiting for some test data sets and legal permission for release. Maybe there will be something next year.

How big is Energistics?

Today there are seven of us doing all the coordinating work of the SIGs, working with virtual teams comprising some 250 volunteers from member companies. We hope that this will be maintained despite the downturn because, as I said above, now is the right time for standards. But it is clear that many companies are tightening their belts and we will likely see some defectors and will have to tighten our belts further too.

It would seem likely that there will be some cutbacks in your 250 strong cohort of volunteers...

Unfortunately yes. There will be losses and worse, we will be losing some subject matter experts who will likely be assigned other rôles or who may be leaving the industry. Some will carry on into retirement – those who are passionate about standards and who have a desire to see things through.

The key message is one of increased efficiency through standards. This easily justifies the cost of membership. Folks used to say that a geoscientist spends 60% of his/her time looking for data. It is probably more accurate to say today that they can find the data, but far too much time is wasted in correcting or matching data. Energistics standards eliminate this waste and let folks get on with interpreting.

What's on the horizon for Energistics?

We are very excited about the new ETP protocol for real time data streaming. This uses a dedicated port to stream data at TCP/IP speeds. Likewise ETP can allow Prodml and Resqml data to stream from one application to another. There is a lot of interest in this approach. All three MLs now sit on the common ETP platform and we will see the distinction between Wits/Prod/Resq MLs dissolve over time.

More from [Energistics](#).

Story maps and Russian pipe-dreams

Exprodat uses new Esri technology to 'tell the story' of CSIS analysis.

Exprodat has been working with the Centre for Strategic and International Studies (CSIS) to 'tell the story' of Russian pipeline dreams and realities. The work was performed to illustrate the conclusions of a July 2015 CSIS publication titled, 'From pipe dreams to pipelines' by Edward Chow and Zachary Cuyler. The report is an investigation into several yet-to-be completed Russian pipeline projects whose total cost is put at between \$150 and \$200 billion. The

authors doubt that Russia will be able to finance these and that the country is 'groping' for a viable gas export strategy.

Exprodat has converted the CSIS data into an Esri [Story Map](#) (ESM). ESM is an online service to combine data, text, images and video with maps. Exprodat's Simon Kettle said, '*The Story Map is a great way of presenting the CSIS report, with its references to Russian geography which will be unfamiliar to the majority of readers. The new web-based presentation*

lets readers visualize the project and understand what is going on in Russia right now.' The CSIS is a Washington-based 'bipartisan' not-for-profit with substantial support from the oil and gas industry. Watch the Russian pipeline story [unfold here](#).

AGU announces data management maturity program

American Geophysical Union uses CMMI Institute methodology to preserve earth data heritage.

The American Geophysical Union (AGU) has recently issued a position statement to affirm that, 'Earth and space science data are a world heritage. Taking proper care of such data is our responsibility and our obligation to future generations.'

Multiple data sets from satellites, sensors and measurements are 'increasingly critical for the integrity of published

research and for fueling new discoveries.' Trusted data repositories, institutions, and facilities provide the best care for such data but, as scientific data grows in volume and complexity, these facilities are facing challenges. These include curating research data, ensuring quality across repositories and helping researchers collect and organize data through its life cycle.

The answer is good data management. To achieve this the AGU is working with [CMMI Institute](#) to develop a data management [maturity framework](#) and best practices for managing earth and space science data. Results from the program applied to the USGS' ScienceBase will be presented at the upcoming [AGU Fall meeting](#) in San Francisco.

Rapid application development for HPC. New GPGPU tech

Full waveform inversion trial leverages Python and C++. Tesla Maxwell shines in benchmark.

In a presentation at a recent EAGE workshop on high performance computing, Geoff Clark (Acceleware) demonstrated the use of the Python programming language for rapid development of research codes. Clark's team used the [SciPy](#) extension to demonstrate its full waveform inversion algorithm on the

EAGE's Marmousi synthetic data set. A combination of Python and C++ codes provides researchers with the tools required to tailor full waveform inversion to specific applications and optimize codes for HPC clusters.

Acceleware has also been testing the latest Nvidia Tesla/Maxwell architecture which,

while it promises significant improvement on single precision floating-point arithmetic, is less performant on double precision where the older K40/K80 will outperform the new M40/M60 cards. More from [Acceleware](#).

Total CEO on importance of 'digital segment'

Exaflop HPC, giga-cell simulation, T-Storm platform underscore in-house development approach.

In a [short plug](#) for the 2016 Schlumberger Forum which is to be held in Paris next year, keynote speaker Patrick Pouyanné (Total's CEO) sets out a vision of an upstream where everything is connected, thanks to digital technology. Total is to leverage its 'digital segment' to be 'more efficient at \$50 oil' and to lower operating costs.

A recent in-house [publication](#) shines further light on the extent of Total's ongoing digital transformation. Computing power installed at Total's CSTJF scientific and technical center in Pau, France is now rated at 6.7 petaflops and is set to attain exaflop bandwidth by 2020. Along with

the raw compute power, Total is working on HPC architecture, languages and programming models and new algorithms for depth imaging and reservoir simulation. Total has a stake in the next generation Intersect reservoir simulator which is now capable of handling giga-cell simulations.

Total believes in achieving a competitive advantage from in-house development. The Total seismic to reservoir modeling (T-Storm) platform provides a common platform for proprietary tool development. These include new unstructured grids, geomechanical models and full physics models of fluid flow. Other key in-house

developments include Sismage (seismic interpretation) and WakeUp (upscaling).

For drillers, Total's T-Desk well design is said to guarantee 'complete independence' from drilling contractors. T-Desk federates Total's expertise in drilling simulation and well construction and is modestly claimed to be, 'unmatched by any other industry major.'

Total is always on the lookout for new breakthrough technologies and has set up a 'Prospective Lab' to provide early warning of novel, high potential developments from outside the industry. Current developments of note include nano-sensors (in work with [Apix Analytics](#)) and robotics.

Software, hardware short takes

Geomodeling, KBC Advanced Technologies, New Century Software, Industrial Defender, IFS, Detection Technologies, Emerson, Exprosoft, Schneider Electric, Sercel, RockEye, RSI, Rose & Associates, SimSci, Visuray.

Geomodeling's [AttributeStudio V7.7](#) includes seismic-derived reservoir property prediction and sweet-spot mapping for horizontal wells.

KBC Advanced Technologies has announced Petro-Sim 6.1. The hydrocarbon process simulator's 'open and extensible' platform provides developers with access to the Petro-Sim database.

New Century Software's [Spatial Risk Analyst 3.0](#) now offers a workflow-driven GUI, improved model building and support for larger models.

R6.2 of **Industrial Defender's** Automation systems management ([ASM](#)) solution includes new widgets for control systems monitoring and management.

IFS Applications [release 9](#) includes an in-memory capability, enhanced process visualization and support for rental management.

The 3.05 release of **Detection Technologies' Analysis** compression optimization and fleet management solution tracks equipment failures and root causes,

calculating and classifying downtime as scheduled or unscheduled.

Emerson Process Management's [OpenEnterprise v3.2](#) adds a Hart/WirelessHart native interface to its AMS Device Manager asset management software. Users can access and manage devices in wide-area scada networks.

A new edition of **Exprosoft's** WellMaster integrity management system ([IMS](#)) includes 'ground-breaking' functionality providing in-depth knowledge of the overall risk picture and integration with the 'reliability' sister application RMS.

Schneider Electric/Invensys' PipePhase 9.8 network flow modeler includes upgrades to data interfaces with Olga, CMG Stars and GEM. Other tweaks include Excel-based data entry of pipeline profile and wellbore data input, UOM reporting and conversion and more.

Sercel has 'launched' a new underwater positioning solution [GeoTag](#), a general purpose acoustic positioning solution for seabed seismic acquisition. GeoTag

functions in water depths of up to 500 meters.

RockEye has announced [RockLib](#), a seismic library visualization and indexing utility that scans network discs for SEG-Y files at 15Gb/min speed. Data is presented in a map view and metadata extraction allows for direct import to Petrel, Kingdom and other interpretation suites.

RSI and Rose & Associates have upgraded [SAAM](#), their seismic amplitude analysis system which now includes a controlled source electromagnetic module.

SimSci has released a new edition of its [Visual Flare](#) modeler for oil & gas, refining and petrochemical flare stack modeling. The issue adds support for [Dippr data](#).

Visuray's [VR90](#) X-ray wireline tool performs downhole imaging of wells filled with opaque fluid.

Ryder Scott - shale reserves, reporting and ethics

On the SEC and shale. Updating the PRMS. Legal aspects of the downturn. Engineers and ethics.

The collapse of the oil price has made regulatory reporting a fraught business. Speaking at the authoritative Ryder Scott Reserves Conference earlier this year, John Lee (**University of Houston**) provided an update on how the SEC is treating shale, where in fact, there are no special reporting regulations. However the particular nature of the novel 'resource' makes interpreting the SEC's rules problematical. What for instance is 'reliable technology' in the context of shale evaluation? For the SEC this can include computer modeling providing it gives 'reasonable certainty' and produces volumes that are 'more likely than not.' The burden is on the reporting company to provide proof that such is the case. The SEC also requires that reported volumes are scheduled to be drilled within a five year time frame, a tough call in today's low price environment.

The SPE's influential Petroleum reserves management system ([PRMS](#)) is being

updated to clarify its handling of shale. John Ritter (**Occidental**) enumerated the significant differences in its evaluation as production history is generally short, there may be few or no analogs and conventional petrophysical analysis may not be relevant. The PRMS authors are revisiting their basic definitions as shale estimates migrate from what was previously considered 'discovered unrecoverable' into risk-based economically recoverable categories. Quite a balancing act!

James Cowen (**Porter Hedges**) addressed the legal aspects of the fall in the oil price, in particular letters that the SEC has sent out to reporting companies. A survey conducted by Ryder Scott found that reserves-related comments are increasing, especially in regard of proved undeveloped reserves and the five year rule. The review letters and responses may be made public through the [Edgar system](#). Cowen recommends assembling a technical and legal team to respond quickly to the letters.

Note that, if probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate.

All of which can put the petroleum engineer in a difficult position, as Steve Corso (**Haynes Boone**) explained in his 'Ethics hour' presentation. Companies may pressure a petroleum engineer to inflate reserve estimates who may be tempted to manipulate calculations to reach a pre-determined result or to assign value to an uneconomic field. Companies may fail to de-book reserves even when they clearly do not meet SEC requirements. The answer is to be objective and truthful and not to make 'fraudulent, deceitful, or misleading (in any way) assertions' and not to associate with a venture that is engaged in such activity. More from [Ryder Scott](#).

2015 SPE ATCE, Houston

Opening general session panellists debate state of industry. Big data/analytics results from Aramco, Halliburton, Chevron, Ryder Scott. Semantic web developments from Chevron, Baker Hughes. Kappa on shale. Schlumberger on well integrity. Aramco's Manara smart wells.

At the opening general session of the SPE Annual Technical Conference and Exhibition (ATCE), the moderator Eithne Treanor asked '\$60 oil? What happened?' Jarand Rystad (**Rystad Energy**) replied, 'It all started here. The people in this room were too smart and too clever. You created, not oil from shale, but money from the bond market!' Shale, along with weaker demand made Saudi Arabia start a 'volume war' with a '2 million barrels per day increase' from OPEC over the last year. This has led to a 'perfect storm, not the short sharp shock the Saudis wanted.'

All the operators agreed that in the meanwhile, costs have got out of control in the last 5 years. In reaction to this, cost cutting is rife. Bernard Looney reported that the initial estimate for BP's Gulf of Mexico Mad Dog Phase II development was \$20 billion. It is now down to \$14bn and BP is asking 'can we do it for \$10bn?' Scott Tinker (U. Texas **Bureau of Economic Geology**) like many has been through several major energy cycles but previously the global energy mix 'never noticed.' For the last 35 years, fossil fuels were steady at around 85%. Today this is changing with a steady slow decrease in fossil fuel's share. Jorge Leis (**Bain & Co.**) added that as the world economy (with the possible exception of the US) slows, we 'should not hold out hope for a demand side solution.' Looney rejoined, 'Hope is not a strategy. We have to manage and control what we can and drive costs down. There is plenty of opportunity to do this.'

Treanor asked what the impact of renewables was going to be. Leis said that it depends on whom. Bain & Co. does not advocate oils diversifying from their core competency. But we are entering an era of structural change, with climate change legislation and new technologies for renewables. Battery technology is a game changer. The diversification of energy sources is happening. But oil and gas companies should 'Stick to your guns but be cognizant of the impact risk of renewables.' Looney stated that BP has over 80% of world energy out to 2035 as coming from fossil fuels. The IEA's greenest scenario has half of world energy being met by oil and gas. The latter has huge role to play. Also oils have big alternative energy business, Shell in

biomass, Total in photovoltaic and BP (erstwhile 'Beyond Petroleum') in wind. Tinker was skeptical as to the impact of renewables. 'I don't do personal opinion or hope.' Wind, sun, tide are all resources like oil and gas. We develop the best one first. But things bump into challenges of scale, for instance many renewables technologies may have issues with the supply of raw materials as they scale up.

Treanor asked what the panel thought of a carbon tax. Looney said, 'it depends on where you are.' There are a billion poor people in the world who just want the things we take for granted. But BP thinks that carbon does need to be priced, a tax is necessary and will be high on the COP21 agenda. EU IOCs have signed a letter supporting a tax. Tinker 'playing the devil's advocate' observed that the biggest reduction of CO2 has occurred in the US, as fracking has replaced coal and where there is no carbon tax. In the EU, with its emissions trading, there is now a moratorium on Nuclear and on fracking! 'You can't not like everything!' Of course the biggest emissions come from China but, it's not their fault, it's ours, we buy their stuff!

During the debate, participants were invited to vote on a range of topics using the Freeman XP Touch online polling system. Asked 'should oils diversify into wind and other renewables' a surprising 86% of the engineers votes 'yes.' And 63% thought that energy companies can transition to new energy companies.

The **digital energy session** heard from Maithem Al Nakhil (**Aramco**) on novel automated workflows for a 'large carbonate reservoir'. These have been developed in response to the 'challenging' amount of data streaming in from Aramco's i-field where it is proving hard to monitor production and water injection and arrive at timely decisions. Enter the 'integrated dynamic surveillance tool' IDST. This allows for data triage with a 'heterogeneity index' i.e. Value(well)/AvgValue(wells), used to recommend wells for workover. A real time display shows production, the evolving water cut and non compliant wells. The system will (note future tense!) 'help and support us in our daily work.'

Sunitha Gyara introduced **Halliburton's framework** for scalable and reusable digital oilfield implementations. The digital oilfield has evolved such that today, systems can detect and rank production anomalies and perform diagnostics. Software models can be corrected and physical infrastructure adjusted. But there are new challenges of equipment downtime, system complexity and, echoing the Aramco presentation, of information obesity. There are also the old issues of silo challenges to collaboration and new ways of working. Individuals' goals may not be aligned, and folks may have a partial view of the production process. The answer (here comes the sales pitch!) is: Halliburton's new production architecture, a flexible IT architecture offering integration services, data quality analytics and an engineering modeling suite. The system includes 'virtualization' of disparate data sources and is built on Microsoft SharePoint.

Andrei Popa described **Chevron's** use of 'big data' in heavy oil reservoir management. First, Chevron tried to understand what big data meant with a literature review. It turned out to be an evolving concept that was 'difficult to grasp' and that has come to mean any 'advanced analytics.' Whatever. Chevron's Kern River business unit was defining its own 'big data' with 17,000 active wells pushing a billion points/day into Energy Components, Hollysys RMIS and other systems. Most of this is structured data and at 'only' 8 - 10 GB/day falls short of big data à la Google. Chevron's big data solution does not leverage the new data lake/Hadoop technologies, rather an in-house built custom app to 'bring all this together.' Popa claimed '\$10 - \$100 million' in value creation from the system's use in analyzing distributed temperature gauge data during steam flood.

Ryder Scott's He Zhang has been using neural nets to classify malfunctions occurring in electrical submerged pumps (ESP). Root causes of failure include insufficient well inflow, wax, emulsion, reverse rotation, leakage and outright failure. For a long time engineers have been using ammeter card readings to evaluate ESP malfunction. Classifying this data previously required a huge manual

effort. Today the data set is a perfect candidate for artificial neural net diagnostics. Ryder Scott now has a database of failure modes. Most interesting are the cases which slip through the neural net. Analysis of one 'unexplained' pattern suggested a tubing leak which was later verified by the operator.

Our old friend the semantic web cropped up in a couple of presentations. Randall McKee presented **Chevron's** work with USC/CiSoft on '[rapid data integration](#) and analysis for upstream applications.' The work addresses the perennial problem of multiple data sources, multiple databases and the fact that 'everyone has their own view of the data.' Enter the new data integration and analysis framework (DIAF), that uses semantic web technology to automate the discovery of links between data, a process called '[unified fuzzy ontology matching](#).' Queries can thus execute across multiple ontologies. The UFOM approach helped realize 8 months of mapping in two weeks. Other CiSoft work involved machine-learning driven 'shapelet' investigation of anomalies in time series data such as ESP intake pressure. The semantic approach allows for data mining across heterogeneous data

sources and the integration and analysis of text in reports and operator logs. More from [CiSoft](#).

Bob Rundle (**Baker Hughes**) has also been using semantic web technology to help [validate a subsurface model](#) by tracking data provenance across the workflow. Geomodeling suffers from sparse data and bags of uncertainty. Ideally we want to capture the provenance of all a model's components. Enter an object repository to capture provenance and track an object's change history. All objects (logs, deviation survey, grid) are given a unique [IETF RFC 4122](#) identifier. An entity-attribute-value (EAV) triple store was used to managed object and version identifiers, ensuring that everyone works from current data. The EAV data is housed in a NoSQL data store. A 'single version of the truth' is not good enough. What is required is a 'local but reconcilable version of the truth!' The fixed schema repository is a barrier to innovation. In the Q&A Rundle revealed that this a prototype and that to benefit from the approach, applications would need to be re-engineered.

A presentation on the [Kappa Engineering](#) booth on unconventional workflows revealed that 'We do not yet know what

we do not know!' Shale presents a steep learning curve. Of the three flow régimes predicted by theory, we only expect to see the first two in the practical life of a well. Decline curve analysis remains popular but a plot of Eagle Ford wells' decline shows a cacophony. Normalization and cross plots (using [Citrine](#)) help but while all models give good agreement with the data, forecasts differ. Kappa's KURC App is only available to members of the unconventional resource consortium. A **Schlumberger** booth presentation on well integrity compared standards from the API, Norsok and others. Schlumberger's [InVizion](#) integrity service uses its Techlog software to collect integrity data and documents with added InVizion plug-ins. Checkout the Eagle Ford [case history](#). Schlumberger and **Aramco** also showed off the '[Manara](#)' system a commercialization of Aramco's 'extreme contact' hybrid multilateral well watch and inflow control system. More from the SPE ATCE in our next issue.

Where did carbon capture and storage go?

Netherlands CATO-2 event reveals flagging support for CCS pending 'robust' carbon pricing.

Shell - 'long term commitment' required to move from today's white elephant projects to CCS at

We attended the annual [CATO-2](#) event in Rotterdam last month for an update on CCS. Master of ceremonies Jan Brouwer (**TNO**) observed that while renewables are making faster progress than anticipated, fossil fuels will play a major role in energy supply for the next several decades. Limiting their greenhouse gas emissions will mandate the use of CS as a 'bridge' to a greener world.

Anita van den Ende from the **Dutch environment ministry** outlined the 'interesting times' of energy in the run-in to COP21. Current COP21 pledges fall short of the 2°C warming target, so 'more action, including CCS is necessary.' While current focus is on technology, social acceptability is a big issue for both CCS and wind – folks say 'yes' to renewables but 'not in my back yard!' van den Ende expressed 'curiosity' as to where the EU CCS flagship [ROAD Project](#) is going. ROAD sees Rotterdam as a CO2 'hub' for Northwest Europe.

There will be a Netherlands pavilion at COP21, van den Ende invited CATO folks to tag along.

Maarten de Hoog (of the **Rotterdam port authority DCMR**) said that Rotterdam was set to be the world capital of CCS. Coal fired power plants are 'needed in this country' so why was the CCS ambition not met? One answer is cost, and another is foot dragging Greenpeace which sees CCS as aiding and abetting coal, and there are the nimbies. Answering van den Ende, de Hoog stated that the ROAD demonstrator is in the final decision phase and its future is uncertain. CCS is the future if we want to solve the climate issue, but politics and economics have proven stumbling blocks to date.

Project director Onno Tillema confirmed that the **ROAD** business case failed because of high capex, opex and 'abex' the cost of abandoning the pilot and operating at scale. The hope was that the emissions trading scheme was going to pay for the operation, but ETS prices are now too low. The team is to remobilize early 2016 with a final go/no go decision for mid 2016.

Tim Bertels (**Shell**) warned that we may not hear much about CCS from the Paris COP21. While CCS is a 'reality,' without

a robust carbon price, it is 'cheaper for companies like ours to vent CO2 to the atmosphere.' Shell, like other oil majors sees natural gas as 'abundant, affordable and acceptable,' thanks to 50% less emissions than coal. Shell is involved in several CCS pilots at various stages of funding or advancement but what is really needed is a long term commitment to CCS rather than today's one of a kind/white elephant projects.

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We also listened-in to a recent web meeting hosted by the **International Energy Agency** where we heard poacher-turned-gamekeeper Kamel Ben Naceur (formerly Schlumberger, now IEA director of sustainable energy policy and technology) explain that CCS was largely absent from the IEA's current 'Bridge' scenario. More in our next post-COP21 issue.

on the spot report

Folks, facts, orgs ...

Headwave, API, Cameron, Check-6, Total, Making Waves, OvationData, Kosmos Energy, Lloyd's Register, Enable Midstream, IO Oil & Gas, GeoMark, IDS, IOGCC, Earth-I, Navigator Energy Services, PennWell, PPDM, Tibco, Wood Group, American Gas Association, GeoTeric, EMC, SGI, Ziebel, Anadarko, Rock Solid Images, Saudi Total, AspenTech, Schneider Electric, Seven Lakes.

Alan Cohen has joined **Headwave** as strategic advisor.

Ryan Lance (ConocoPhillips) is chairman of the board of the **American Petroleum Institute**. Greg Garland (Phillips 66) heads-up the finance committee.

Scott Rowe is the new **Cameron** president and CEO, succeeding retiree Jack Moore.

Laura Owen is CEO of **Check-6**. James Weynand joins as chief revenue officer.

Gilles Cochevelou has been named chief digital officer of **Total**.

Dancy Dynamics is re-branding as **Making Waves Marketing**, adding expertise in marine technology and renewable energy.

DPTS has changed its name to **OvationData**.

Rob Thomas is CIO and VP Information Technology at **Kosmos Energy**. He hails from Exco Resources.

Alastair Marsh is the new CEO at **Lloyd's Register**. Mary Waldner takes his old position of CFO.

Enable Midstream Partners has promoted Rodney Sailor to president and CEO.

IO Oil & Gas Consulting has hired Chris Freeman as director of field

development. Other new hires include Robert Dickson (projects), Graham Inman (ops), Tim Highfield (facilities) and Philip Howe (subsea).

GeoMark is now **IDS'** exclusive agent for the Egyptian market.

Texas Railroad commission chairman David Porter has started a year long term as vice chairman of the US **Interstate oil and gas compact commission**.

Peter Hausknecht is now chief scientist at satellite imagery specialist **Earth-I**.

Jeffrey Allen has joined **Navigator Energy Services** as CFO and senior VP.

Following the retirement of Robert Biolchini, **PennWell** has named Mark Wilmoth as president and CEO.

Lesley Evans, Brian Boulmay and Jeremy Eade have been elected to the **PPDM** board.

Tom Berquist is now CFO at **Tibco**. He hails from Saba Software.

Robin Watson succeeds retiree Bob Keiller as CEO of **Wood Group**.

Ralph LaRossa (PG&E) is chairman of the **American Gas Association** board for 2016.

Mark Walker is now **GeoTeric** VP, Americas. He hails from ION.

Nina Hargus is now chief marketing officer of **EMC** Information Infrastructure.

Mack Asrat has been named senior VP and CFO of **SGI** following Bob Nikl's retirement.

Francis Neill is the new **Ziebel** CEO.

Mitchell Ingram is executive VP, Global LNG with **Anadarko**.

James Tomlinson heads-up **Rock Solid Images'** new office and technical hub in Sheffield, UK.

Hisham Atalla is general manager of the Zahid Group/Total joint venture, **Saudi Total**.

Karl Johnsen is now SVP and CFO with **Aspen Technology**.

Prith Banerjee is now CTO with **Schneider Electric**. He hails from Accenture.

Seven Lakes Technologies has named Jim Schulte as chief revenue officer, John Pitstick as CFO, Sowmya Murthy as CMO and Bret Wiener as CTO.

Correction

In our report from the 2015 ECIM conference (N° 8 2015) we wrongly placed the Taranaki basin in Japan. It is in New Zealand. Thanks to Duncan Irving for putting us right.

Done deals

ESIA, Richmond Energy Partners, WoodMac, Verisk Analytics, Infield Systems, Willbros, TRC, TGS, Digital Petrodata, Telular, SkyBitz, SmartLogix, Schlumberger, Fluid Inclusion Technologies.

Newly-formed **Energy Software Intelligence Analytics** (ESIA), a provider of strategic and business intelligence services, has acquired **Richmond Energy Partners**. ESIA is backed by the Energy Ventures private equity. Earlier this year ESIA acquired Hannon Westwood and Novas Consulting. ESIA is on the lookout for more acquisition targets offering 'unique business intelligence, analytical software solutions and technical insights into the energy industry.'

WoodMac parent **Verisk Analytics** is acquiring **Infield Systems**. The deal will 'enhance upstream supply chain business intelligence and modeling capabilities.' WoodMac CEO Stephen Halliday

described the deal as a 'small, tuck-in acquisition.'

Willbros Group has sold its professional services unit to **TRC Companies** for a \$130 million cash consideration. Willbros will retain \$43 million of the net proceeds to maintain its current liquidity and working capital. The rest will go to pay down loans as a component of an ongoing restructuring.

TGS has acquired **Digital Petrodata**, a Denver-based provider of GIS data and cloud solutions for E&P companies. DP's nationwide multi-client database contains 'every producing oil and gas field, pool, and formation in the US.' The company's 'GeoNews' service is a spatially located

and tagged database of current oil and gas news.

Telular unit **SkyBitz** has acquired **SmartLogix**, a provider of petroleum management, inventory and logistics solutions. SmartLogix will integrate SkyBitz' remote asset tracking and information management offering. Telematics specialist SmartLogix also recently acquired GPS North America and Reltima, both local fleet management solution providers.

Schlumberger has acquired Tulsa Oklahoma-based geochemical logging specialist **Fluid Inclusion Technologies**. FIT performs laboratory analysis of fluid inclusions and borehole gas analysis on drill sites.

Markus Evans supply chain conference

Gasunie on sustainable procurement through understanding your suppliers' business. Siemens on avoiding traps in negotiations. Dong Energy's 'lean' operations.

Speaking at the recent Markus Evans oil and gas procurement and supply chain management conference in London, Thibaut deGroen outlined how **Gasunie** is working towards 'sustainable' procurement. The added value of procurement is its knowledge of the whole supply chain and production process. Clients' engineers may specify output requirements, but procurement specifies input and throughput requirements. deGroen stressed the importance of seeing things from the seller's viewpoint. For many of its suppliers, Gasunie represents under 5% of their business. Also half of its requirements present significant deviations from suppliers' standard products. Gasunie is potentially an 'unattractive' client. Sellers don't like clients that tender most orders or those to whom only price counts.

Some may fall into the nuisance category for the supplier. A lack of continuity and unsustainable procurement leads to less commitment from suppliers and eventually a drop in quality. This has been observed in out-of-spec materials and equipment failure during testing or even in the field. Procurement can help change this situation by understanding and communicating changes to suppliers and by involvement in suppliers' processes. This includes audits of a supplier's quality system and checking that work is conformant. DeGroen advocated use of the [Kraljic portfolio purchasing model](#) which sees 'purchasing as supply management.' From the supplier side, Dirk Hoffmann (**Siemens**) suggested improving contract negotiations by avoiding traps in the negotiation chain. These often stem from

'surprising' clauses in non-disclosure agreements and in the ownership of intellectual property that derives from the work. This can be fixed by discussing and agreeing on principles and terms rather than starting with boilerplate legalese. The whole vendor, sub-vendor and sub-sub-vendors supply chain need to be considered early on.

Johnny Mikkelsen described how **Dong Energy** was going 'lean' on its operations in response to the falling oil price. Today, cost and efficiency improvements of up to 40% are required to give the North Sea a viable future. Dong is working on controlling costs by focusing on small scale projects and using a standard, modular approach to design, lump sum EPC contracts. More from [Marcus Evans](#).

Ikon Science teams with Schlumberger on QI

Quantitative seismic interpretation to boost Petrel. New geopressure plug-ins announced.

Schlumberger and Ikon Science are to enhance Petrel's quantitative seismic interpretation capability, adding Ikon's [RokDoc](#) technology and 'democratizing' specialist geoscience and engineering workflows. Uwem Ukpong, president of Schlumberger's Software Integrated Solutions unit said, 'we will co-develop our quantitative seismic interpretation

technology in a complementary way, while continuing to involve WesternGeco, our seismic acquisition and processing business unit, to make these advanced reservoir characterization workflows accessible to more users.' Ikon CEO Martyn Millwood Hargrave added, 'Our plug-ins for Petrel support rock physics, quantitative interpretation

and geopressure workflows. The new collaboration will improve the user's experience and increase productivity by improving RokDoc integration with Petrel.' Ikon is an approved Ocean framework partner and recently announced the RokDoc PressureView and Pore Pressure Calculator plug-ins for Petrel.

Software AG - agile processes for oil and gas

New solution for shale fluids management. Predictive analytics and IoT add-ons to Apama.

Darmstadt, Germany headquartered Software AG argues that oil and gas companies need more 'agile' processes in the current 'volatile' price environment. Agile processes that leverage SAG's [WebMethods](#) are the way to contain costs and eliminate waste.

A new industry [solution brief](#) for energy and natural resources provides a roadmap for companies planning for agility. SAG's agile processes for Oil and Gas solution offers tools to discover and reengineer business processes. Models are run under different inputs to identify variances between designed and executed processes. Historical data can be analyzed to pinpoint inefficiencies and to 'discover how and why processes operate as they do.' Process

re-engineering and management tools are then used to prioritize the reengineering effort.

SAG technology underpins a [tight oil and gas fluids](#) supply management solution developed for the North American shale market. SAG for shale brings real-time insights into fluid supply and demand status, on-site, ordered and in-transit volumes and monitoring of injection, flowback and disposal. The system integrates with ERP and order management systems for automatic reordering, logistics, payment and regulatory reporting.

In a separate announcement, SAG has added predictive analytics and new internet of things capability to its Apama

streaming analytics a.k.a. complex event processing platform. [Apama release 9.9](#) offers on premise or cloud deployment including support for Docker containers. SAG claims over 200 Apama deployments in Fortune 500 companies.

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Sales, deployments, partnerships ...

Landmark, CGG, WellDog, Silixa, Perigon, EasyCopy, Advisian, KBC, AIMS Global, Augmensys, Allegro, Atos, Siemens, Aveva, DNV GL, Emerson, FIS, SAP, Rignet, Intellian, ITC Global, Kalibrate, Katalyst, KBC, BPT, Leica, NCTech, Life Cycle Engineering, Woodhouse Partnership, Mtell, Novacura, IFS, Anachron, Taulia, OFS Portal, P97, Verifone, Visa, Wood Group.

Landmark and **CGG** have signed a technology collaboration to develop next generation geoscience workflows, data and reservoir characterization technologies.

WellDog, along with partner **Silixa**, has created a 'WatchDog' business unit to market DTS installations and services for real time monitoring of frac jobs, production and reservoir conditions.

Perigon and **EasyCopy** are to provide mutual customers with enhanced core workflow solutions. EasyCore projects can now be stored and opened in iPoint.

Advisian and **KBC** have agreed to jointly pursue oil and gas consulting, software, design and engineering contracts.

AIMS Global Consulting and **Augmensys** are to integrate mobile data management software with the ZynQ 360 HD spherical photo and video technology.

Southwest Airlines has selected the **Allegro** platform to optimize its fuel management. Allegro has also been deployed by Trafigura to support the management of its natural gas trading business.

Atos and **Siemens** are to extend their joint IT and R&D programs. Atos is also working with France's geological survey BRGM to offer innovative digital services in the fields of geosciences, the environment and civil engineering.

Techflow Engineering has invested in **Aveva** Bocad structural steel design software to support customers' complex

offshore projects. Nipigas has extended its contract for Aveva's integrated engineering and design solution.

Orgneftekhim Holding has chosen Aveva Everything 3D for its engineering and design projects.

DNV GL is to provide in-service verification and classification services for the Australian Ichthys LNG mega project.

Sasol has chosen **Emerson** to automate its \$9 billion petrochemical complex in Lake Charles, Louisiana.

FIS has partnered with **SAP** to integrate its mobile payment gateway solution with SAP's vehicles network.

Rignet has selected **Intellian** as hardware partner on a recent contract for an offshore drilling communications solution.

Maersk Drilling has awarded **ITC Global** a three year multi-million dollar contract for the provision of Vsat communications and 24/7 network monitoring.

ST1 Nordic has deployed **Kalibrate's** Pricing Cloud solutions to its newly acquired fuel retail sites in Norway.

Katalyst Data Management is to provide a seismic data management solution to the Geological survey of Queensland and the Australian government's department of natural resources and mines.

KBC and **Billington Process Technology** have expanded their reseller agreement by including the full suite of BPT's Apps for Process Simulation.

Leica Geosystems and partner **NCTech** are to deliver automated, colorized 3D point clouds for enhanced usability and clarity.

Life Cycle Engineering and **The Woodhouse Partnership** are to promote international standards and best practices in risk-based management systems.

OSIsoft has partnered with **Mtell** to integrate its big data/machine learning technology with the PI System.

Novacura has joined the **IFS Partner Network** to resell, implement and support IFS Applications.

Anachron and **Taulia** have joined **OFS Portal**. The companies will provide eProcurement solutions to the eight members and 230 buyers in the community.

P97's PetroZone mobile e-commerce has been integrated with **Verifone's** cloud-based point-of-sale solution for gas stations and convenience stores.

LLoyd's Register is to deploy an enterprise resource planning and business management solution from **SAP**.

Visa and **Chevron** have launched a mobile payments program using a near-field communications payment service.

Wood Group has been awarded a multi-million dollar contract to provide engineering services to BP's Gulf of Mexico, North Sea and offshore Azerbaijan operations.

Standards stuff

New API frack standards. Open Group IT4IT 2.0. OMG IDL4 adopted, new CISQ coding standards.

The **API** has issued new editions of its technical standards for fracking, [ANSI/API RP 100-1](#) and [100-2](#). The new standards provide detailed specifications for pressure containment and well integrity, as well as environmental safeguards, including groundwater protection, waste management, emissions reduction, site planning, and worker training. The release follows last year's publication of ANSI/API Bulletin 100-3, which covers community engagement guidelines. The API is also to take over **ANGA**, the America's natural gas alliance, a shale gas lobby group founded

in 2009. ANGA will become a new API division led by Marty Durbin. Last year the API spent \$9 million on lobbying, ANGA 'only' \$1.4 million.

The **Open Group** has released V2.0 of its [IT4IT](#) reference architecture and 'value chain-based operating model for managing the business of IT.' The reference architecture supports cloud-sourcing, 'agile,' DevOps and service brokering. IT4IT complements existing methodologies such as ITIL, CoBIT, SAFe, and TOGAF with a data perspective and information model.

The **Object Management Group** has adopted the Interface definition language submission. [IDL4](#) provides a language-independent description of a software component's interface to allow for communication between software components developed in different languages. The OMG has also released CISQ standards for the measurement of source code reliability, performance and maintainability. Another protocol, Essence 1.1 is a high level tool to help engineers evaluate different methodologies.

OSIsoft EU User Group, Prague

PI as 'go to' tool for real time enterprise. PI big data edition. Shell's smart solutions platform.

Stephen Kwan's presentation at the EU user group in Prague last month made it clear that **OSIsoft** now positions its PI system flagship as the 'go to' tool for the realtime/process enterprise. Kwan showed how PI, as well as capturing real time data in its traditional historian role, is now 'delivering future data' with predictive analytics. PI Data Archive 2015 allows forecasts to be captured in the historian and used to update models and predictions.

Such functionality overlaps with the big data movement, the subject of Martin Otterson's presentation. This focused on the new PI Integrator a.k.a. the 'big data edition' with connectors for Hadoop,

Cloudera and Hortonworks coming 'real soon now!' In the interim, the key connector links PI with SAP Hana in what OSIsoft like to call IT/OT convergence.

John de Koning provided an informative look into **Shell Global Solutions'** move from a complex software landscape to a highly rationalized software line up built on an enterprise service layer - a.k.a. the Smart solutions platform. The SSP leverages PI components throughout from synchronized PI 'super collectives' up through the stack to Coresight. The latter is deployed in Microsoft Sharepoint alongside Telerik's Kendo HTML 5/ JavaScript GUI. As Shell has previously

reported, Microsoft's Odata standard is also leveraged.

Most a propos for the upstream was Mark Hughes' presentation on data complexity and connectivity. Hughes announced new connectors for OPC UA and Energistics Witsml and a novel software as a service offering running in Microsoft's Azure cloud. An alternative data warehouse architecture envisioned a data lake from Oracle, Teradata or Microsoft. Finally, in 2016 V3.0 of PI Coresight is set to subsume the functionality of PI Process Book and Web Parts in what may be a welcome rationalization of the burgeoning portfolio. Read the presentations here.

Aveva Engage software for Shell's engineers

Shell deploys collaborative engineering tool on UHD touch screens.

Aveva's new Engage software for collaborative decision making across capital projects and operating assets has received a strong endorsement from Shell's New Orleans business unit. Engage is a touch-driven interface that provides access to information stored in a digital asset, such as that deployed in Shell's Vantage platform (OITJ V20 N°8).

Aveva Engage is a Windows 8.1 app for large (up to ultra-high definition) touch screens that combines whole model visualization with access to the digital asset repository. Engage accesses data from connected sources and presents information relating to a selected tag. Schematics, equipment drawings, single-line diagrams, instrument loops and more are all available on the device.

Shell's Robert Samudio, who collaborated on the development of Engage said, 'Engage's touch-screen technology and the ability to use 3D models with other disciplines across global locations help Shell's decision-making and safety. It is changing the way we work and how we deliver our projects.' Engage was previously named Project Voyager.

Schneider Electric teams with Cisco on turnkey scada

Baseline integrated scada system, 'BLISS,' combines scada and IT in 'converged' platform.

Schneider Electric, through its Telvent scada unit is working with Cisco on a new pipeline control solution, 'Bliss,' for 'baseline integrated scada system.' Bliss is positioned as a turnkey solution combining scada and IT infrastructure in a 'converged' platform. Telvent's Oasys scada is to be combined with Cisco's networking into an 'internet of things'-

style platform for new pipelines or for upgrading existing systems. The solution provides operators with real-time visibility into the structural integrity of the pipeline, optimizing maintenance and repairs.

The 'one-stop shop,' combined IT/OT solution obviates the need for multiple integration partners. Bliss integrates the

scada system into a modern infrastructure. Cisco 'Internet of everything' VP Tony Shakib said, 'Integrating IT with scada systems will improve project efficiency, quality and life cycle cost.' The companies are also planning an integrated networking and telecommunications service for pipelines to couple Bliss with other Schneider automation solutions.

EnerKnol energy market regulation software

US energy policy data specialist's 8-dimensional search recognized at White House Datapalooza!

New York-based US energy policy data specialist EnerKnol has rolled out a new edition of its energy regulation management software. EnerKnol 2.0 tracks information and policy developments that help hedge risk and identify opportunities in energy markets. The system provides customizable alerts and streamlined access to policy information.

EnerKnol's data cloud includes over 4

million filings from energy-related federal agencies, regional transmission operators, independent system operators, public utility commissions, state agencies, federal and state legislation, and local municipalities, 'among others!'

EnerKnol 2.0 was developed in collaboration with EnerKnol's early adopter working group, an industry consortium that includes GDF Suez (now

Engie) and Xcel Energy. New in V2.0 is an innovative 8 dimensional search platform for individualized policy portfolio creation. Last year EnerKnol was invited to the White House's energy 'Datapalooza' event, celebrating innovative use of 'open' government data.

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BP, Bit Stew, GE and upstream big data

BP COO extols big data and analytics. CISCO-backed Bit Stew pilot with GE Oil & Gas.

Speaking at Offshore Europe in Aberdeen earlier this year, Bernard Looney, BP COO production enthused on the potential for big data analytics in the upstream. A trip to Silicon Valley convinced him that big data will revolutionize how we drill wells, optimize production and more. There may be 'up to 50,000' different routes through a typical hydrocarbon processing facility. Finding the best path through can add up to 4% to throughput. In a North Sea trial BP has screened a 5,000 well and 250,000 km. sq. 3D seismic datasets looking for

'me too' analogs of its 'previously overlooked' Vorlich discovery. Using big data analytics, 5,000 wells were analyzed in 'just a few seconds.'

Meanwhile, in Silicon Valley, Industrial Internet specialist Bit Stew Systems reports that its MIx Core platform is 'gaining traction' in oil and gas, helping companies solve the data integration challenge at scale. The platform correlated an oil and gas data set in less than five hours compared to six man months with a 'traditional' approach. Bit Stew has also

kicked off a pilot program to integrate its technology with GE Oil & Gas' software. Bit Stew founder Alex Clark said, 'We are disrupting traditional approaches for integrating industrial data. Instead of relying on software technologies and data architectural models unsuited for the massive scale of data streaming from industrial systems, we have created an industrial data library platform that scales, rapidly dissolving data integration challenges.' Bit Stew has financial backing from GE and Cisco.

Synectics surveillance technology protects new build LNG

COEX camera stations and Synergy software monitor decks and critical infrastructure.

UK-based surveillance specialist Synectics has contracts for the provision of integrated surveillance solutions for three oil and gas vessels under construction for the Asia Pacific market. Synectics' technology comprises 'Coex' camera stations and Synergy 3 software and is designed to protect assets, processes and

people in oil and gas environments.

The latest deployment involves two Korea-built LNG carriers which deploy camera stations and microphones to monitor mooring space, cargo manifolds, deck operations, and vessel-critical infrastructure such as the boiler, motor and compressor rooms. Over 60 COEX camera

stations will also be deployed on a non-propelled floating LNG vessel to monitor production storage and offloading areas. Synergy, Synectics' software platform provides a command and control station and data management. The Synergy 'open' platform integrates with third party systems.

Fracking with super critical CO2

Los Alamos National Laboratory researchers trial waterless frack fluid with partner Chesapeake.

The October 2015 issue of 1663, the Los Alamos national laboratory's (LANL) science and technology magazine, Craig Tyler investigates 'what's lacking with fracking.' As US electricity production shifts from coal to cheap shale gas, per-capita emissions of carbon dioxide have dropped to a level not seen since the 1960s. LANL has been looking into the technical and environmental challenges associated with shale production. Fracking only produces some 15% of gas in place and turns a lot of freshwater into 'highly

toxic' wastewater. While the risk from chemical additives used in fracking may have been overplayed, produced water is more problematical, containing large quantities of naturally occurring salts, heavy metals, and radioactive elements. Supercomputer simulations and experiments carried out at the lab suggest that using supercritical carbon dioxide (scCO₂) may be a more efficient way of fracking shale. scCO₂ combines mechanical and thermally induced fractures and has less of a flow-blocking effect than water.

Reducing water use and sequestering CO₂ are central themes of two DOE crosscutting initiatives, SubTER (subsurface technology development for energy security and environmental responsibility) and the Water-Energy Nexus (interdependence between water and energy resources). The Los Alamos study also involves experimentation on shale cores provided by industry partner Chesapeake Energy. Read the informative six page article in [1663 online](#).

Pantera Energy deploys Kepware Ignition scada

Champion Automation delivers remote monitoring solution to 1,300 onshore wells.

Pantera Energy has implemented remote monitoring with a modern scada system from Kepware and Inductive Automation. Pantera used to rely on human pumpers for daily monitoring and management of wellsite operations across its 1,300 onshore wells. The new system combines Inductive's Ignition scada platform with Kepware's KEPServerEX industrial communications hub.

Pantera operations engineer Jerrod Kee

said, 'Ignition and KEPServer have need deploys as an intuitive, single-pane solution that is encouraging adoption and use. We couldn't find another scada system that supported applications for metering, compressors, salt water disposal, and pump off controllers.'

Off-site managers can access the system remotely from a virtual network computing display (VNC) and spot operational anomalies that would have

previously only been identified in a weekly visit. Pantera can now prioritize intervention to its most productive wells. Jeff Klumpp from system integrator Champion Automation added, 'No other OPC platform is as flexible and easy to use as Kepware.' The system is also claimed to 'bridge the gap between cutting-edge and legacy equipment' and to enable remote operations management and emergency shutdown.