Digitalization
- Gateway to Norwegian world class technology and competence

REPORT TYPE 09.Sep 2019

Complete Digitalization Catalogue
Digital Twins delivered on 4insight.io™

2019-08-27 - 4Subsea

Category: Information Technology and services  
Subcategory: Data Management services  
Type: Service

With 4insight.io™ oil & gas and offshore wind operators can "know it before it happens" - and act accordingly, thus preventing costly repairs or production shutdown. We provide Digital Twins designed to help operators improve data quality and manage the ownership, security, sharing and use of data, while at the same time reducing operational costs and risk. Key decision support is delivered as a service on 4insight.io™.

We believe that having well documented data, managed in a context based system, is essential when planning operations. 4insight.io™ is born in the cloud, builds on Microsoft Azure and utilises Azure’s scalability features to the full – from compute resources to storage, handling complex computations and storing large amounts of data.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria.
Reference

4insight.io™ web page
Digital Twin for risers and flowlines
Digital Twin for drilling operations
Digital Twin for offshore wind
DataReservoir.io™ web page

Contact

4Subsea
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https://www.4subsea.com
Sensor Technology for Subsea and Offshore Wind Operations

2019-08-27 - 4Subsea

Category: Information Technology and services
Subcategory: Data Management services
Type: Product

4Subsea’s retrofittable, autonomous sensors help operators reduce cost of operations and maximise life of assets, by using the sensors in combination with advanced algorithms, data analytics and specialist engineering competence.

Technology applications include monitoring of wellhead integrity, risers, mooring lines, subsea spools and manifolds, as well as monitoring of pipelines and subsea structures for oil & gas and offshore wind sub-structures. The costs savings in using our expert personnel and advanced sensor technology for maintaining production are significant and long-lasting.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

4Subsea Sensor Technology

Contact

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360° VAM (Visual Asset Management) 3D photo scanning

2019-06-06 - APIteq

Category: Information Technology and services  
Subcategory: Other Information Technology and services  
Type: Product

The oil industry suffers from ineffective communication, time consuming planning processes, and expensive site surveys. APIteq delivers class leading photographic and scanning asset documentation solutions to improve efficiency, save time and cost, and enable right decisions.

The 360° VAM (Visual Asset Management) is a visualization and communication tool for various work processes, such as engineering and operations planning. It combines high quality, true 360° full spherical photos, interactive maps, menus and navigation capabilities. The 360° VAM offers the ability for all users to simultaneously see the entire installation, being onshore or offshore, with 360° full spherical photos. The unique 100 Megapixel Civetta calibrated camera system gives you precise 3D measurements.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

APIteq website
360° VAM

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BPT TEX

2019-04-04 - Billington Process Technology

Category: Compressors and accessories
Subcategory: Other Compressors, blowers and accessories
Type: Product

BPT TEX™ is a software application integrating with industry leading process simulation software. BPT TEX uses literature data and methods provided by Mafi-Trench and Atlas Copco to model the off-design behaviour of the expander and compressor.

In design mode BPT TEX provides turbo expander design parameters and preliminary sizing (wheel diameter and speed). This information permits a selection of the best design point. BPT TEX can be tuned to match an existing turbo expander operation and subsequently be used to explore operation under future operating conditions. Anticipate all operating cases during design and know the capability of your turbo expanders in operation. This knowledge is essential for gas dew pointing plants, NGL, LNG liquefaction and refrigeration systems.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website
BPT TEX™
BPT TEX™ product brochure

Contact

Per Billington
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BPT OLX

2019-04-04 - Billington Process Technology

Category: Integrated Operations
Subcategory: Production
Type: Product

BPT OLX® is available as an extension linking the multiphase simulation software OLGA® (v7.2 and onwards) from Schlumberger Information Solutions (SIS) and industry leading process simulation software. OLX connects process simulators to wells, production, injection and export pipelines. The OLX is a core element for executing API 521 safety studies and assists optimizing plant inlet arrangements to maximize production within the plant safety levels and the flare capacity.

Test and verify slug control system and strategies, enable realistic operator training systems, and optimise designs, operations and prepare tie-ins with minimum modifications. BPT OLX assists realistic and cost effective production chain decisions.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website
BPT OLX®
BPT OLX® product brochure

Contact

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BPT FSG

2019-04-04 - Billington Process Technology

Category: Safety / Protection / Security / Firefighting Equipment  
Subcategory: Security Equipment and accessories  
Type: Product

BPT FSG® (Flare Scenario Generator) determines relief rates from dynamic simulation scenarios for import into the Flare System Analysis software. FSG tracks and automatically captures flow rates, pressures, temperatures and compositions of all selected relief sources in a dynamic case. The software determines real peak relief loads, over time, during relief scenarios. BPT FSG is available for use with the Aspen HYSYS and other Hyprotech heritage dynamic simulation tools.

Using FSG will assist identifying whether a planned upgrade of capacity or feedstock change really stresses your relief system. Avoid unnecessary and costly modifications to a flare system by doing a rigorous evaluation. BPT FSG assists realistic and cost effective production chain decisions.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website

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BPT PSX

2019-04-04 - Billington Process Technology

Category: Safety / Protection / Security / Firefighting Equipment
Subcategory: Fire / Gas Detection / Protection systems
Type: Product

BPT PSX™ is a software unit operation providing a detailed representation of all types of relief valves. PSX is designed for use in the most commonly used process simulators. PSX uses published data in API 520 9ed to model both effective designs and rated vendor capacity. Rated capacity may be verified for the selected orifice and vendor de-rating correction factors and curves. PSX calculates both steady state as well as transients. Correct relief valve capacity ensures equipment overpressure protection and avoiding excess flare loads.

• Effective relief valve sizing for design
• Rated relief valve “as built verification”
• Ensures compliance with API 520 ref. 4.3.2, “changes in vapour rates and relative molecular masses at various time intervals”
• Assist proper tailpipe dimensioning

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website
BPT PSX™
BPT PSX™ product brochure

Contact

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BPT CODES

2019-04-04 - Billington Process Technology

Category: Compressors and accessories
Subcategory: Centrifugal Compressors
Type: Product

BPT CODES™ is a software tool to develop a simulation model of a compressor based on classic design theories. CODES can be used with high degree of confidence to predict the performance of a potential compressor, before any vendor data is available. CODES can also be matched to installed designs and be used to evaluate off design operations. For new tie-backs and new gas properties CODES will immediately provide feedback on the how existing machinery will be operating as well as providing guidance on selection of new new impeller designs, if required.

CODES runs integrated with the Hyprotech-series of process simulation tools, i.e. Petro-SIM, UniSim and HYSYS. CODES has a long reference list in the upstream industry and is being used in the LNG industry to optimize liquifaction designs.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website
BPT CODES™
BPT CODES™ product brochure

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API 521 safety studies

2019-04-04 - Billington Process Technology

Category: Safety / Protection / Security / Firefighting Equipment
Subcategory: Other Safety / Protection / Security / Firefighting Equipment
Type: Service

BPT safety studies uses linked transient simulations from the inflow in the production tubing to the relief system in one integrated simulation environment. Our methodology provides 100% compliance with the API 521 standard without any simplifications. Full traceability on component level is obtained.

This service has evolved since 2007 and has proven to provide valuable insight for the operators to maximize the production within the asset integrity limits. This is achieved by linking rigorous multiphase pipeline models with transient process simulations. BPT PSX™ provides an exact replication of any API 520 relieving device ensuring "one-to one" between plant and prediction model. The BPT FSG® allows the capacity and relief of the flare and at the flare tip to be accurately predicted.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

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BPT LLX

2019-04-04 - Billington Process Technology

Category: Integrated Operations
Subcategory: Other Integrated Operations
Type: Product

BPT LLX® is available as a software linking the multiphase simulation software LedaFlow® (v2 and onwards) from Kongsberg Digital to UniSim Design from Honeywell Process Solutions and KBC AT Petro-SIM. Virtually all LLX inputs and outputs are available through browsing the LedaFlow model. This allows full control of what happens inside the LedaFlow model from the simulator GUI. It also allows trending of any variable and plotting profiles.

The LLX application features multiple measures such as:
• Continuous updating of compositions to avoid phase flow inconsistency
• Improves fidelity of dynamic process model boundaries
• Evaluate pigging operations including topside equipment design and control structures
• Connects process simulators to wells, production, injection and export pipelines

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website
BPT LLX®
BPT LLX® product brochure

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BPT TSF

2019-04-05 - Billington Process Technology

Category: Computer and Communication Equipment
Subcategory: Computer Software
Type: Product

BPT TSF™ lets you feed time series data to a model from various sources. These data can be entered directly in the GUI, they can be retrieved from an Excel sheet or from an OPC server. The TSF also writes data from a process simulator to a data historian using OPC. In the case of an OPC server, a dynamic model will run synchronous with the OPC server. With some data historians, an OPC HDA connection can be used to run the model using past data.

• BPT TSF makes using a model with online data easy and fast to implement
• Run a dynamic model in parallel to your plant to generate soft sensor data
• Run your plant at peak efficiency with minimal effort
• Analyse past upsets and learn how to prevent the next upset
• BPT TSF enables a virtual representation of the real plant

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website
BPT TSF™
BPT TSF™ product brochure

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BPT Digital Operator Support System is a field proven digital twin using online real-time data to continuously calibrate a thermodynamic model of the entire oil and gas facility. DOSS® provides high quality data and the ability to bring insight of components from the produced fluids, their rates and properties. DOSS adds a layer of information enabling thousands of “soft sensor” signals not measured by physical hardware. Component “health” and “utilization” KPI’s and time-series of “losses” for rotating equipment are automatically calculated. Through a WEB interface, the entire organization is informed. Engineers are equipped with a simulation assisted predictive tool for proactive operations. DOSS provides asset integrity limits to machine learning and AI solutions, ensuring asset safety.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website

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EXT™ is an Excel add-in to run simulations and extract data from models. It will extract all the information you need from all the simulation cases that need to be considered for a project - just at the click of a button.

EXT works both for steady state and dynamic simulation data. For dynamic models it also provides a case comparison strip chart generation tool. Pre-defined templates for automatic line sizing and reporting of critical properties, hydrate, compressor/expander performance and more. Company specific templates can be created for tailoring business stream needs. Profile input specified via BPT MWF™ saves the configuration time by 90% and speeds up the simulation time by a similar percentage. Time to perform one set of conceptual simulation is reduced from 10 to one day.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

BPT website
BPT EXT™
BPT EXT™ product brochure

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BPT MWF

2019-04-08 - Billington Process Technology

Category: Information Technology and services  
Subcategory: Software development and support services  
Type: Product

BPT Multi Well Feeder is a software application configuring individual wells in one single location. It allows for quick definition of current or future well compositions, GOR, water cut and liquid flow rate.

In early phase studies with limited or no PVT data available, the reservoir specification could be limited to GOR, water cut and stock tank oil density. MWF™ includes a generic fluid generation capability for such cases. Any set of C6+ components can be used to characterize the oil fluid. Time required to specify a multi-year production profile is reduced by at least a factor of 10. The typical saving for a 20-year profile run would be in the order of 80 hours. On average, a model using MWF will require only 10% of the simulation time and CPU usage compared to nominal set-up.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

BPT website  
BPT MWF™  
BPT MWF™ product brochure

Contact

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GeoCloud is a hybrid cloud solution for E&P that delivers high-performance IT systems and customized software solutions for advanced geoscience and engineering applications.

As cloud computing is fundamental to increase the effectiveness and benefits of digital transformation, GeoCloud accelerates digital transformation in E&P by making immersive 3D graphics available to the end users. This enables users with demanding graphics to take advantage of the superior computing, storage, and networking power of the data center while being released from the limitations of a physical workstation.

GeoCloud enables secure access to any cloud and gives one seamless experience on all your devices from any location.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

Cegal website
GeoCloud | E&P Cloud Solution for oil and gas
Customer reference | Energie Beheer Netherland

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Automated monitoring and real-time optimization

2019-04-08 - eDrilling

Category: Integrated Operations
Subcategory: Drilling
Type: Product

wellAhead™ is eDrilling's software solution for automated monitoring, real-time optimization, and live well support. It is designed for use on rig, in real-time decision support centers, and for any other individual or teams supporting live drilling operations. It is also the foundation of any viable rig-side automation.

eDrilling uses artificial intelligence and predictive analytics to foresee what will happen with your well. Our software provides diagnostics and first actions to the crew (or directly to the control system) in order to change the drilling plan – to avoid problems.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

eDrilling website
eDrilling blog & news

Contact

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Epsis TeamBox

2019-06-06 - Epsis

Category: Integrated Operations
Subcategory: Operation
Type: Product

We help our clients integrate information, people, process and technology – in a simple, practical manner to support everyday operations. Our approach is based on our proven competency and extensive experience within digitalization in operational settings.

Epsis delivers early and long term value realization and sustainable improvements, often enabled by our unique digital technology platform Epsis TeamBox. Our track record includes delivering real changes in operational performance, collaboration, information management, decision-making and supporting new ways of working; resulting in increased revenue, reduced downtime and improved cost savings.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Epsis website
Customer stories

Contact

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Metering and analysis

2019-06-28 - Flux Group

Category: Electrical, Instrumentations and process control equipment.
Subcategory: Metering, detections equipment and analysis systems
Type: Product

Flux Analytic is an advisor and supplier of equipment and systems within fiscal metering, online analysis, sampling and laboratory equipment. We provide our customers with complete solutions for oil and gas analysis, measurement and instrumentation. From available well data, we design and deliver the complete analysis and allocation chain, all the way from the production process through to the accounts system.

Our competence in combination with close cooperation with leading manufacturer ensures our client are supplied quality and fit for purpose solutions.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Flux Analytic website

Contact

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Manual and Actuated Valves

2019-07-03 - Flux Group

Category: Valves and Accessories  
Subcategory: Actuators and various values instrumentations  
Type: Product

Flux Valvision has close cooperation with leading suppliers and provide a variety of manual and actuated valves to the onshore and offshore industry. We have the ability to build valve and actuator assemblies and valve stem extensions. We also provide valve testing, certification, maintenance and service solutions.

Our specialists have unique and extensive experience with valves and mechanical equipment in the marine, onshore and offshore industries. We provide equipment that meets the high quality requirements specified by the industry.

Through close cooperation with customers and suppliers we have developed innovative digital tools for seamless and transparent tracking of deliveries from raw material through to assembled products.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Flux Valvision

Contact

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Flux Norwegian Piping is stockholder and supplier of pipe, fittings, flanges and special piping items for the offshore oil and gas industry.

As an Equinor frame agreement holder we are a quality gatekeeper to our customers and specialize in alloy steel piping, NORSOK M-650 qualified by either ourselves or the other frame agreement holders.

Through innovative and digital tools we ensure close and transparent follow-up of deliveries from raw material through to finished products.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

Flux Norwegian Piping

**Contact**

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Trust Portal

2019-07-03 - Flux Group

Category: Information Technology and services
Subcategory: Data Management services
Type: Product

Flux Group is developing a unique on-line portal for safe handling of critical product certificates and documents. The Trust Portal eliminates opportunities for forgery and falsifying certificates and documents by use of block-chain technology.

Technology readiness level (TRL)

According to API RP 17N

TRL 3: New technology tested Prototype built and functionality demonstrated through testing over a limited range of operating conditions. These tests can be done on a scaled version if scalable

Reference

Flux Group

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Subsea Robotic Solutions

2019-07-03 - IKM Technology

Category: Integrated Operations
Subcategory: Operation
Type: Product

1. IKM Technology manufacture Subsea Robotic Solutions, which can be operated from an onshore control center (OCC). Our Subsea Robotic Solutions is all-electric. Our Remotely operated vehicle (ROV) is compact and powerful. (200HP). The ROV is delivered in two version, on for retrieval and one for permanent installation on the seabed. Both system is operated for an OCC without a latency issue.
2. Operating the system from an OCC reduce the personnel offshore and the cost, several systems can be operated from a single OCC. In addition reduced CO2 footprint for the operation.
3. Our company specialize in Subsea robotic solutions, which is all electric and remotely operated. Our next technology step is to implement AI and make the system with autonomy.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

IKM Technology

Contact

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Whereoil platform

2019-04-09 - Kadme

Category: Information Technology and services
Subcategory: Software development and support services
Type: Product

Whereoil is an insight engine for E&P data sources designed for big data and analytics. Whereoil connects to several information sources, both structured and unstructured, and offers a robust API for machine learning and E&P workflow integration.

To unlock the full potential of their data, companies need to digitally transform their business and get ready to take advantage of new technologies such as machine learning, cloud computing and artificial intelligence. Whereoil gives them a rapid path to achieve these digitalisation efforts, with effective methods to search, access and connect this data making it available for interpretation and analysis by both humans and machines.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Kadme website
Whereoil platform
Diskos

Contact

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Miros Cloud

2019-05-20 - Miros

Category: Electrical, Instrumentations and process control equipment.
Subcategory: Monitoring equipment and systems
Type: Service

Miros Cloud is a service offering which is currently available alongside several of our core sensors. It introduces the following benefits:
• Accurate, reliable data accessible from anywhere via the internet
• Cloud-integration allows for enhanced scalability and user access on- or off-shore
• Ocean state data can be hosted centrally, in the cloud
• Low maintenance costs: Cost-effective, remote upgrades and online diagnostics
• Low upfront costs due to the as-a-service pricing
• Quick setup and deployment, the cloud offering is truly plug and play

By making dry measurements of sea state available through the cloud as a service we aim to give customers access to real-time data while having a choice of whether or not to invest in the necessary equipment for data collection and transfer.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Miros Cloud
How to Use Cloud-Integrated Wave Radars to Mitigate Risk While Creating Operational and Cost Efficiencies?
Charting New Waters in the Cloud: Miros Delivers Ocean Insights as a Cloud-Integrated Service
Sharing Real-Time Sea-State Insights for Maritime Industries

Contact

Hildur Smaradottir
NEMS environmental management suite

Category: Environmental Equipment and Products
Subcategory: Other Environmental Equipment and Products
Type: Product

NEMS’ environmental management solution is based on over 30 years of domain knowledge, and is tailor-made for the oil & gas industry. All the needs for a typical oil & gas operator is ready out of the box - no installation needed, only access to a modern web-browser.

Our solution will:
• Give you a complete overview of your emissions and discharges
• Provide you insight of your operations through instant analytics and KPIs
• Import data from source systems automatically
• Automate your environmental reporting
• Integrate with any solution via open API

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

NEMS website
NEMS environmental management suite

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E2E logistics management

2019-06-17 - NorSea Digital

Category: Information Technology and services
Subcategory: Software development and support services
Type: Product

E2E delivers an instant overview of the flow of goods, both in terms of geographical position and real-time process control. This allows logistics supervisors to see exactly where an item is at any point in time, and why the item is at this specific location. E2E helps companies to run greener and more efficient logistics operations. Entire supply chains become more efficient through increased visibility and collaboration, while their overall carbon footprint is reduced.

E2E has an open standard, which allows for simple integration with a wide range of tracking technologies from both logistics supervisors and suppliers. More predictability and an improved flow of information also leads to better decision making and reduced risk of delays.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

E2E website
Market place for green technology
Kongsberg promoting E2E

Contact

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www.norseagroup.com/no/companies/norsea-digital
Drilling and offshore crane simulators

2019-05-20 - Oiltec Solutions

**Category:** Drilling and Well Engineering Equipment and services  
**Subcategory:** Other Drilling and Well Engineering Equipment and services  
**Type:** Product

The Oiltec Solutions’ team footprint is to increase our customer’s operational safety and performance. Thus, our product spectrum covers all relevant operational areas – from port and offshore crane to well control. We deliver market-leading simulator products. Our dynamic simulator solution enables you to train with a digital-twin. Address the operational challenges your crew face in the real world into our simulators and overcome these challenges through unique Simulator Aided Training (SAT). The Oiltec Solutions team is capable of executing major projects within drilling, subsea and crane simulations.

Choose Oiltec Solutions as your long-term simulation partner for improved operational excellence.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

Oiltec Solutions website  
Drilling and offshore crane simulators

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Apis platform

Category: Information Technology and services
Subcategory: Data Management services
Type: Product

Apis is a component based real-time industrial software platform used in more than 1000 installations, mostly in mission critical areas within oil & gas, maritime and manufacturing industries. Apis supports a variety of time-series data communication protocols such as OPC, OPC UA, Modbus and WITS.

Typical use of Apis is as:
- Data historian
- Data acquisition hub
- Protocol converter
- IOT / cloud gateway
- OPC UA based information modeling framework

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Prediktor website
Equinor - OPC UA Gateway
Aker BP - drilling data information modelling

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EC Integrated Asset Modeling (IAM)

2019-05-06 - Tieto

Category: Integrated Operations  
Subcategory: Operation  
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC IAM module allows oil and gas companies to graphically and computationally integrate models and optimize petroleum assets. Any third-party or in-house models, simulators and data sources can be integrated to form a unified model spanning the value chain. This module provides sensitivity assessment and optimization capabilities to define business opportunities dependent on complex cause-and-affect dependencies affecting the entire value chain. It is used to optimize field development plans, model how changes to existing infrastructure affects bottle necks and asset performance, and to improve long term planning and reservoir recovery strategies.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

Tieto website  
EC Integrated Asset Modeling (IAM)

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The EC Upstream Management module provides a dedicated management dashboard to evaluate optimization results and scenarios and contains components for well performance monitoring, automated well testing and short-term production optimization.

Well performance monitoring detects if wells are not performing as expected, triggering notifications when unexpected events occur. Automated well testing covers automatic detection of stable periods, accurate calculation of well test shrinkage factors and flowing composition and automatic acceptance of well tests. Short-term production optimization provides functionality to optimize day-to-day operation how the asset is operated on a day-to-day basis by maximising oil production and minimizing operational costs.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

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EC Cargo Management

2019-05-06 - Tieto

Category: Integrated Operations  
Subcategory: Operation  
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Cargo Management module provides a solution for managing an optimized portfolio-wide ADP and SDS. It facilitates optimized robust plans contributing to increased profitability with minimized need for third-party cargoes, vessel chartering and optimized feed stock and send-out schedules.

This module is a collection of tools which provides tailored workspace in EC. Its KPI-driven evaluation, efficient scenario management and analysis provides tremendous value to our customers. Adding more weight to this offering are the EC optimization framework and its powerful visualization.

Technology readiness level (TRL)

According to API RP 17N

TRL 5: Technology integration tested Full-scale prototype built and integrated into intended operating system with full interface and functionality tests

Reference

Tieto website

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EC Chemistry

Category: Integrated Operations
Subcategory: Operation
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Chemistry module aims to improve information flow and reduce cost of operation by enabling more focus on predictive decisions for optimisation, rather than reacting when problems occur, which often leads to costly interventions. Improving production regularity and operational integrity by controlling the chemical impact on operations leads to lower operational costs either by chemical usage or running of equipment. This module is planned and designed as a collection of functions for optimizing operations related to oilfield production chemistry.

Technology readiness level (TRL)

According to API RP 17N

TRL 5: Technology integration tested Full-scale prototype built and integrated into intended operating system with full interface and functionality tests

Reference

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EC Environmental Monitoring

2019-05-07 - Tieto

Category: Integrated Operations
Subcategory: Operation
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Environmental Monitoring module is planned to enable monitoring of chemical impact to the environment and tracking emissions of greenhouse gases. Chemical discharge is traced using a mass balance calculation for reporting usage and discharge volume to authorities, as well as monitoring compliance with regulations. The module tracks volatile components from sample and analysis as well as modelling for estimation emission of these components. Chemical discharge and emissions are set up with regulatory reporting as required by different country authorities.

Technology readiness level (TRL)

According to API RP 17N

TRL 5: Technology integration tested Full-scale prototype built and integrated into intended operating system with full interface and functionality tests

Reference

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Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Revenue module handles invoicing and control of any data relevant for revenue recognitions, including a two-way interface with financial accounting systems. Its comprehensive functionality for revenue accounting supports the needs and requirements found in all major oil and gas regions. Energy Components is the only solution that addresses the complete value chain from reservoir to revenue. Specifically built for the upstream industry, it handles some of the most complex revenue arrangements including lifting agreements between JV parties, royalty/PSA agreements, multi-product and multi-currency invoicing.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

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EC Production

Category: Integrated Operations
Subcategory: Production
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Production module covers the functionality required by upstream organisations for all aspects of production management, including forecast and target setting, tracking actual performance versus targets, identifying bottlenecks and successfully realising the full production potential of assets.

It is designed to handle specific requirements from e.g. oil fields with associated gas, gas/condensate fields, coal-bed methane fields, heavy oil and bitumen production, subsea deepwater developments with FPSOs, offshore platforms, shallow water and swamp installations, onshore pumped wells without any automation, tank farms, gathering systems, etc.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

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EC Transport

2019-06-13 - Tieto

Category: Integrated Operations
Subcategory: Operation
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Transport module follows hydrocarbons when they are transported from the production site to the sales point. It helps to ensure continuous delivery and integrity of the transport. Furthermore, it is able to cover hydrocarbon processing terminals which are often integrated in the transport systems.

For transportation by pipeline, EC Transport ensures the pipeline balance by tracking what enters/exits the pipelines at one or more entry/exit points. For transportation by vessel, EC Transport supports the planning of shipments, registers all terminal operation processes, generates the shipping documents and keeps track of lifting accounts.

Technology readiness level (TRL)

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

Reference

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**EC Sales**

**2019-06-14 - Tieto**

**Category:** Integrated Operations  
**Subcategory:** Operation  
**Type:** Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Sales module supports the sales organisation in selling and/or trading hydrocarbons, including managing complex product sales contracts, and is relevant both for own and partner-operated assets.

It provides capabilities to attribute actual deliveries to sales contracts according to priority and user-defined rules and perform full contractual accounting according to contract clauses. Its main tasks are to track sales quantities and to perform any necessary processing of the quantities to make them ready for invoicing purposes. EC Sales is also able to calculate product, contract and cargo prices, including complicated algorithms and price index inputs.

**Technology readiness level (TRL)**

According to API RP 17N

TRL 7: Proven technology integrated into intended operating system. The technology has successfully operated with acceptable performance and reliability within the predefined criteria

**Reference**

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EC Pipeline Management

Category: Integrated Operations
Subcategory: Operation
Type: Product

Tieto’s software suite EC is an integrated hydrocarbon management solution which supports the needs of all oil and gas operations.

The EC Pipeline Management module provides a dedicated workspace to efficiently plan large and complex pipeline distribution networks. It enables transportation service operators to schedule at a portfolio level which helps to reduce both silo thinking and the need for curtailments and in addition maximizes the customer service level.

EC Pipeline Management provides a single version of truth allowing planners to quickly make fact-based decisions. Supporting all parties involved in the planning process, this module facilitates efficient information access freeing up time to make better decisions.

Technology readiness level (TRL)

According to API RP 17N

TRL 5: Technology integration tested Full-scale prototype built and integrated into intended operating system with full interface and functionality tests

Reference

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VE G-SIM

2019-08-27 - Visual Engineering

Category: Information Technology and services
Subcategory: Computer based modelling services
Type: Service

Integrating advance immersive gaming technology and realistic 3D virtual environment, VE Gamified Simulator (G-SIM) enables training of complex and dangerous operations in a completely safe virtual environment without the expensive hardware of a traditional simulator.

Technology readiness level (TRL)

According to API RP 17N

TRL 3: New technology tested Prototype built and functionality demonstrated through testing over a limited range of operating conditions. These tests can be done on a scaled version if scalable

Reference

VE G-SIM

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