



SOCIETY OF PETROLEUM ENGINEERS

SPE NEWS

COPENHAGEN SECTION



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INNOVATION OR THE SAME PROCEDURE AS LAST YEAR?

We kicked the 2017/2018 season off to a good start with some very interesting topics from Shell. And very enlightening to see how an operator has been using the LEAN methodology for the past decade to get "fit for the future" as well as sharing these tools with partners to deliver value in non-operated licenses.

I would like to take this opportunity to thank Hans Plessing for his many years of outstanding and professional service on the board as a representative for Welltec. Mette Lind Fürstnow will be taking over Hans' position on the board and we look forward to her input valuable and welcome her aboard.

Innovation like many so called buzz words is often misused and almost certainly misunderstood, but ignore it at your peril. It is only a new phenomenon for those who have not been paying attention. As the oil and gas industry starts opening up to, and be confronted by, the realities of the 21st Century the extent and pace of change will continue to accelerate. The skill sets once required will be complemented by and in some instances be replaced by a new set of skills. Perhaps you were advised at school to learn a language to compliment your technical skills. German, so you could speak with suppliers or Spanish so you could take an assignment in warmer climates. Now the languages that offer an advantage career

wise are much more likely to be Python and Pearl for example. As service companies partner and collaborate with the likes of Google, Apple and other tech companies we see the age of automation marching steadily closer. Big data, cloud and quantum computing, all technologies that are set to take analysis and decision making out of people's hands.

It may sound like a utopian nightmare but it is closer than we think and the benefits have been seen in other industries for years. Just imagine an intervention being planned and executed based on real data and actual statistical analysis without fudge factors, egos, personal bias or KPI skewing interpretations of data. No doubt some people will wake up in a cold sweat at the possibility and prefer "the same procedure as last year Miss Sophie? The same procedure as every year James." (Cultural reference-"Dinner for one" or "The 90th birthday" shown on TV on NYE). However, this great leap forward for the industry will only be feared by a few and enable that well qualified brain power to be put to use in other, more productive ways.

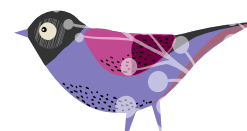
We hope to see many of you at the December and January meetings where GEUS will host our first distinguished lecturer who will talk about one of the current buzz words "big data". Hess will follow in the new year with a look at their ongoing implementation of the LEAN methodology.

Merry Christmas and a happy new year.

Anders Krag
SPE Chairman
Copenhagen Section

FUTURE MEETINGS

FOR MORE INFORMATION REGARDING THE PROGRAMME SEE PAGE 6



SPE

COPENHAGEN SECTION
THE BOARD · 2017-2018 SEASON

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DATABANK AND

The Geological Survey of Denmark and Greenland (GEUS) is a research and advisory institution under the Danish Ministry of Energy, Utilities and Climate.

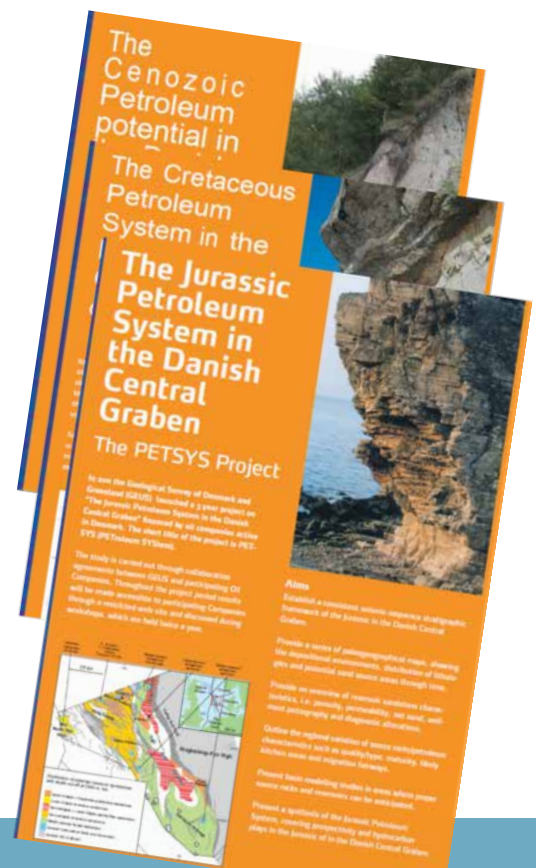
One of GEUS' regulatory responsibilities is to act as the national geological data-centre managing data and knowledge for authorities and making data and research studies available for educational institutions, industries, private persons etc.

In order to maximise the value of all geological data, GEUS manage all kinds of data, including data and material collected and produced by GEUS itself, as well as data and material collected or produced and reported to GEUS by drilling companies, analytical laboratories, oil companies, mining companies, government agencies etc.

All types of samples originating from deep wells in Danish territory are stored in the GEUS core store. The core store has display facilities, which is available for core inspections and - workshops.

In order to fulfil its role as a national data centre, GEUS has established a number of archives, among others the Well Data Archive, Subsurface Archive and Core Store. In addition, GEUS maintains a number of databases to store and access the data. The goal is to make data available for both internal and external users, and GEUS have over the last 15 years systematically worked towards digital solutions, where data can be viewed and downloaded via the Internet. Data can, however still be delivered by request.

We use whenever possible international standards for data exchange, and are part of a series of data harmonization projects with other European countries. GEUS is additionally data controller of geological data in relation to the INSPIRE Directive.



INFORMATION



For the deep subsurface, GEUS has recently conducted a series of regional petroleum system studies; three multi-client studies were carried out dealing with different stratigraphical levels. The Jurassic Petroleum of the Danish Central Graben (PETSYS) was accomplished in 2014, the Cenozoic Petroleum Potential in the Danish North Sea (CENSYS) in 2015 and the Cretaceous Petroleum System of the Danish Central Graben (CRETSYS) will be finalized in 2017. Results from the studies can be accessed by sponsors.

To facilitate the transformation towards more sustainable energy, GEUS has developed a national GIS-based web portal for deep geothermal energy utilization. The portal presents a number of geological map themes, relevant for geothermal energy, so stakeholders in the geothermal industry as well as authorities can form an overview over the nature of the subsurface, geological uncertainty and density and quality of geological data within the Danish onshore and near coast area. The focus is on geothermal sandstone reservoirs located within the depth zone of 800-3000 meters. The portal and the underlying analyses of data and map themes have been prepared for funds as set out in the Danish Energy Policy Agreement of 22 March 2012. ◀



ABSTRACT

ESSENTIAL PREREQUISITES FOR MAXIMIZING SUCCESS FROM BIG DATA

Big Data is an emerging technology in Information Management that holds promising returns on investment, as it can provide advanced analytics capabilities. It is well suited for large enterprises, and when used properly, it can lead to breakthroughs in analytics, deriving information from data that was previously not possible. However, a Big Data project cannot be approached using traditional IT system design and methods. Its success relies on teamwork and collaboration among petroleum engineering subject matter experts, senior IT professionals, and data scientists. To ensure that Big Data initiatives do not deliver poor results or disappoint, Big Data projects require significant preparation, which dramatically increases the chances of success.

This presentation provides practical information about how to get started and what to consider in your plan, and it gives useful tips and examples for planning and executing a Big Data project. At the end of the presentation, attendees will know what Big Data is, what it offers, how to plan such projects, what the roles and responsibilities are for the key project members, and how these projects should be implemented to benefit their organization. Big Data analytics offers enterprises a chance to move beyond simply gathering data to analyzing, mining, and correlating results for insights that translate into business solutions. ◀



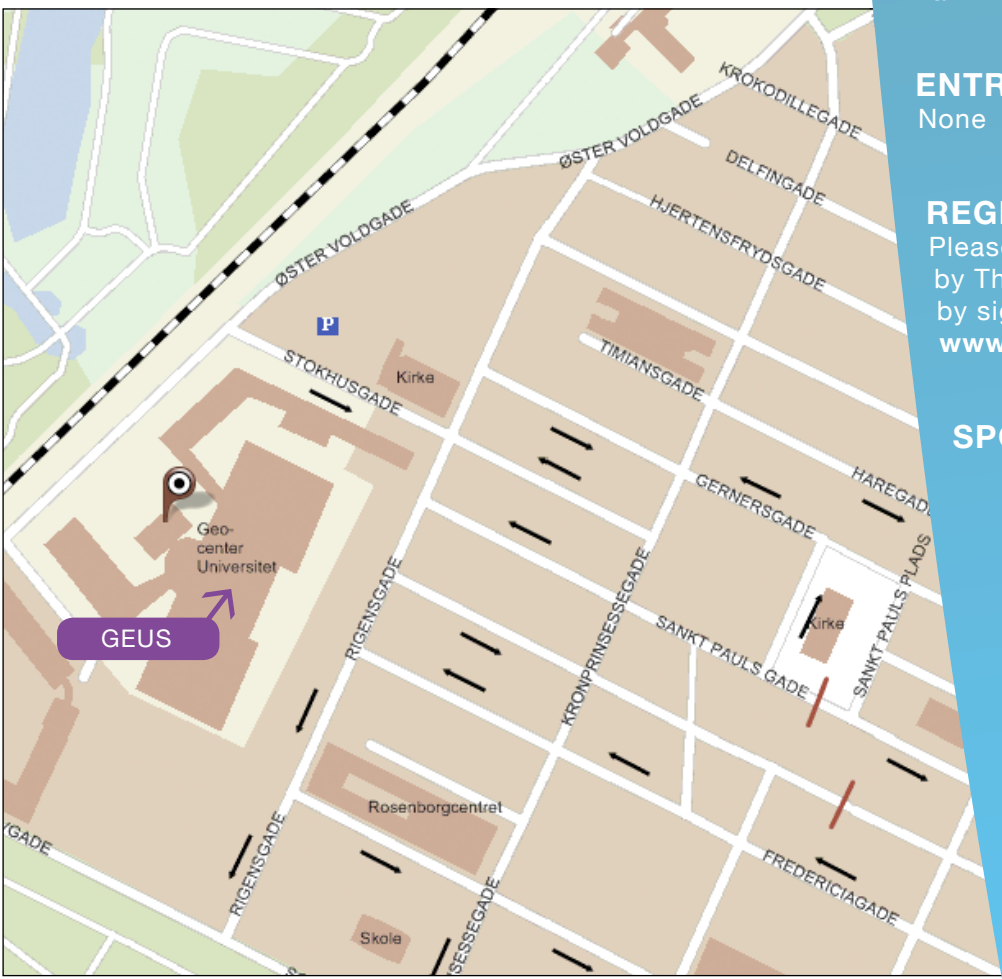
BIOGRAPHY



Muhammad S. Khakwani,
Saudi Aramco, SPE DL

Muhammad S. Khakwani is a Senior Information Systems Consultant and the leading Data Architect for Upstream data at Saudi Aramco. He has more than 25 years of experience in the IT industry working for large enterprises in Canada and the United States, and for the last 17 years in the Oil & Gas industry in Dhahran, Saudi Arabia. He has in-depth expertise in database design as well

as data management, standardization, and governance. He has designed and implemented data warehouse solutions, formulated Real-Time data strategies, and devised controls for Data Security for Saudi Aramco. His current responsibilities include designing and managing the Upstream enterprise data model, as well as strategizing and managing policies related to the corporate Upstream database necessary to meet changing business needs at Saudi Aramco. He has a BS from University of Western Ontario, and an MIS from Webster University. ◀



DECEMBER

PROGRAMME

17:00 - 18:00
DRINKS

18:00 - 19:00
PRESENTATION AND SPE NEWS

19:00 - 21:00
DINNER

LOCATION

GEUS
Østervoldgade 10
1350 København K

SPEAKER

Muhammad Khakwani,
SPE DL

TOPIC

Essential Pre-Requisites for
Maximizing Success from Big Data

ENTRANCE FEE

None

REGISTRATION

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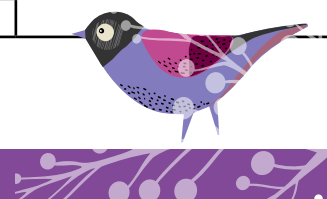
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SPE MEETING SCHEDULE

2017-2018

October 9	MAIN SPEAKER	AFTER DINNER
TOPIC	Developing a Proactive Late Life Asset Mindset & Decision-Based Roadmap	Partnering for performance <i>Lee Hodder,</i> <i>VP Demark Shell</i>
SPEAKER	Odin Estensen, Shell	
LOCATION	Charlottehaven	
SPONSOR	Shell	
November 21	MAIN SPEAKER	AFTER DINNER
TOPIC	Fluid flow simulation in fractured reservoirs Influence of Porous Media on fluid PVT	Industry-academia research collaboration – how can we make this work for the benefit <i>vas von Solms,</i> <i>DHRTC-CERE</i>
SPEAKER	Hamid Nick, DHRTC, Wei Yan, CERE	
LOCATION	DTU	
SPONSOR	DTU	
December 5	MAIN SPEAKER	AFTER DINNER
TOPIC	Essential Pre-Requisites for Maximizing Success from Big Data	
SPEAKER	Muhammad Khakwani (SPE DL)	
LOCATION	GEUS	
SPONSOR	GEUS	
January 24	MAIN SPEAKER	AFTER DINNER
TOPIC	Surviving Lower for Longer Prices with Lean Thinking	Applying Lean <i>Agustin Riccio-Rodriguez,</i> <i>Hess</i>
SPEAKER	Gregg Stocker, Hess LEAN Advisor	
LOCATION	Moltke's Palæ	
SPONSOR	HESS	
February	MAIN SPEAKER	AFTER DINNER
TOPIC	Tyra Future	
SPEAKER	TBC	
LOCATION	Maersk (Amerika Plads)	
SPONSOR	Maersk	
March 22	MAIN SPEAKER	AFTER DINNER
TOPIC	Integrated Historical Data Workflow: Maximizing the Value of a Mature Asset	
SPEAKER	Anne Valentine (SPE DL)	
LOCATION	Welltec	
SPONSOR	Welltec	
April	MAIN SPEAKER	AFTER DINNER
TOPIC		
SPEAKER		
LOCATION	INEOS	
SPONSOR	INEOS	
May	MAIN SPEAKER	AFTER DINNER
TOPIC		AGM
SPEAKER		
LOCATION	TBD	
SPONSOR	Chevron	
June	MAIN SPEAKER	AFTER DINNER
TOPIC	SPE Summer party	
SPEAKER		
LOCATION		
SPONSOR	Schlumberger	





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www.shell.com/future-energy

SPE YP NEWS

Green is the new black

Three geothermal plants currently deliver district heating to local consumers in Denmark. Although there is potential for further development of this clean, renewable energy source, the recently completed Thisted-5 is the first geothermal well to be drilled and completed in Denmark since 2010. The Thisted-5 injector well was drilled to a total depth of 1170 metres, the reservoir is the lowermost porous and permeable sand of the Gasum formation with an expected formation water temperature of 42-44 °C. With the renewed interest in geothermal energy projects - in Denmark and worldwide - there is a potential for petroleum professionals to become involved in the green transition.

Dorthe Juul Kann is a geologist with ten years of petroleum industry experience within exploration and production. Since joining WellPerform, in the role as Project Leader, in early 2016 her focus has mainly shifted to planning and execution of geothermal projects. WellPerform provides a wide range of services within upstream Project Management, Well Engineering and Consultancy work. We have experience in all aspects of the well delivery process. ◀



Lean processes help Hess Denmark resolve oil well challenges and improve business performance at South Arne

Hess Corporation used lessons learned about hydraulic fracturing in its Onshore U.S. Bakken operations to improve drilling performance at South Arne field in the Danish North Sea.



It also relied on cross-team collaboration and the use of Lean — including the first kaizen (a problem-solving method designed to drive continuous improvement) in Denmark — to successfully adapt a completion system from an onshore to an offshore environment. That success is just one example of how Hess Denmark is applying Lean thinking to improve the way it runs its business.

“At Hess, we are embracing a culture of continuous improvement and implementing a Lean management system in both our offshore and onshore businesses,” said Gregg Stocker, Hess’ Lean Advisor for Europe. “Specifically Lean strives to create value through the use of standard work by improving safety, quality, delivery and cost.”

Hess Denmark turned to a new completions technology: a ball drop, sliding sleeve activation system that allows for multiple frac stages to be isolated and simultaneously fractured. The unique system allows operators to bring wells in tight formations on line much more quickly than other methods, resulting in cost savings and earlier production revenues.

The ball drop concept at South Arne was a game changer to the previous completions in the field. It also underscored the company’s commitment to Lean during a complex redevelopment project called the Phase III expansion.

In 2010, Hess sanctioned a \$1 billion (DKr 5 billion) project to maximize returns from the South Arne field, a mature asset that has been producing since 1999. This Phase III expansion — a northern extension of the field — it is expected to make the asset as much as 50 percent more productive.



The development includes drilling, completion and stimulation of 11 new wells (seven new producing wells supported by four water injection wells) in the tight chalk reservoir.

Hess, which has a 61.5 percent interest, operates the South Arne field in partnership with INEOS DeNos (which has a 36.8 percent interest) and Danoil Exploration A/S (1.7 percent).

The Hess Denmark team used Lean to address challenges with transferring a technology from onshore use to offshore use. By relying on an eight-step problem-solving process, a critical element of Lean—Hess Denmark was able to develop and implement solutions with full alignment across the team.

“What Hess does differently from many others is the heightened application of Lean thinking,” said Anders Nymann, Director Denmark Asset. “We clarified our purpose so that everyone is working on the most important things,” he said. Rather than focus only on the tools to address random problems, Hess Denmark has integrated Lean thinking into how it runs the business. The daily,

weekly, and monthly meetings – which the team refers to as their operating rhythm – are interconnected and focused on addressing the problems that interfere with meeting current targets and the long-term vision. “Rather than give status updates and pat ourselves on the back for successes, we use our meetings to identify and solve problems,” says Stocker. “Even with activities that go well, we want to know how they could have gone better.”

In the Copenhagen Office, the Subsurface team developed a Phase III problem-solving room that shows each well in the campaign and the performance against production targets. The team is able to visually show common problems and root causes across the field, which helps them better manage the well operations and interventions. The room has driven significant learning for the team for the current wells and future campaigns. This problem-solving (or kaizen) room was a first for Hess. “By applying some very focused problem-solving, we’re getting a much better handle on our production challenges and are starting to see improvements in meeting our targets,” Nymann said. ◀

SURVIVING LOWER FOR LONGER PRICES WITH LEAN THINKING

Gregg Stocker, Hess Corporation

Hess Corporation began its Lean journey in 2010 to improve performance in its Bakken asset, an unconventional play in North Dakota, USA. Due to the complexities in an unconventional oil and gas operation, the company decided to approach it as a well factory and apply lean thinking to drive continual improvements in safety, quality, production, and cost. The success of the approach led Hess to expand the strategy company-wide to all assets and support functions.

Lean has helped the company achieve the following results:

- Reduced Bakken drilling and completion costs by 60% (from \$11.4 million per well to \$4.5 million)
- Achieved zero NPT in drilling of an exploratory well in offshore West Africa
- Completed construction of the blast wall in its Stampede offshore development two months ahead of schedule and with 50% fewer man-hours when compared to similar projects in the Gulf of Mexico
- Reduced unplanned shutdowns on a North Sea offshore platform from 15 to 2 within two years;
- Completed 13 million man-hours in its North Malay Basin development without a recordable incident



Although the company has seen significant improvements in its operations worldwide, Hess leaders realize that the journey has just begun and, although it is one that will never end, improvements in performance are occurring along the way.

Although originally developed by Toyota, Lean thinking can be applied to any organization in any industry. It is a strategy that focuses on identifying and eliminating waste, which Hess defines as anything that interferes with achieving the organization's purpose – or true north. Lean thinking is built on the foundation of respect for people and focusing on continual learning.

As the oil and gas industry starts to realize that lower oil prices are going to stick around for a while (and possibly forever), many companies are rethinking their approach to the business. Lean provides a framework to challenge the assumptions and beliefs that interfere with achieving sustained levels of success regardless of the price of oil. When applied correctly and consistently, Lean enables continual improvements in an organization's ability to produce oil and gas safely, efficiently, and responsibly. ◀



**Gregg Stocker,
HESS**

Gregg Stocker currently serves as Hess Corporation's Lean Advisor for Europe. He has extensive experience applying Lean in a variety of industries, including automotive, instrumentation, and oil and gas. Gregg has a degree in Materials and Operations Management from Michigan State University, and an M.B.A. from the University of Houston. His experience includes serving as Managing Director for a polymers micronization business in The Netherlands, Director of European Operations for a plastics processing business, and Global Quality Director for an instrumentation and valve manufacturer.

He authored the book, *Avoiding the Corporate Death Spiral: Recognizing the Warning Signs of Decline* (Quality Press), and was a contributing author to *The Lean Handbook* (Quality Press) and *The Complete Guide to Plant Operations Management* (Integrative Production Systems). ◀

Dinner Speaker:
Agustin Riccio-Rodriguez, Hess

Topic:
Applying Lean

PROGRAMME

17:00 - 18:00
DRINKS

18:00 - 19:00
PRESENTATION AND SPE NEWS

19:00 - 21:00
DINNER

LOCATION

Moltkes Palæ
Dronningens Tværgade 2,
1302 København K

SPEAKER

Gregg Stocker, Hess LEAN Advisor

TOPIC

Surviving Lower for Longer Prices with Lean Thinking

DINNER SPEAKER

Agustin Riccio-Rodriguez, Hess

TOPIC

Applying Lean

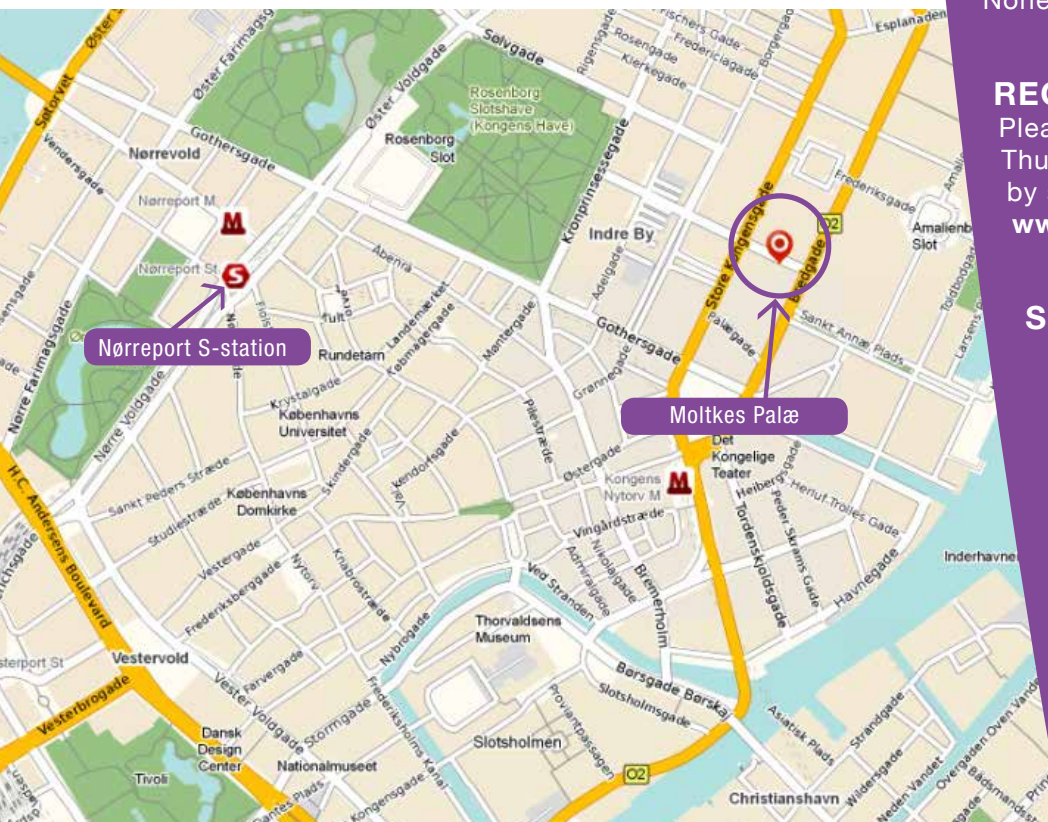
ENTRANCE FEE

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REGISTRATION

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