SUBSEA EXPO 2020
11-13 February, P&J Live, Aberdeen

Tau Autonomy Center in Norway
Connecting Sea and Air

Dr. Arnfinn Nergaard, CEO
Norway’s subsea history is a tale of pioneering spirit and drive, innovation and boldness, and world-class technology solutions and engineering skills. It’s about taking a not-so-tried-and-true approach to solving problems, and then delivering them in a way that’s innovative, ambitious, and world-leading. This book, GETTING DOWN TO IT, offers a look at 50 years of subsea success in Norway, from the early days of oil and gas exploration to the cutting-edge technologies of today.

Subsea technology is not only an important element in the oil and gas industry, but also a key part of Norway’s industrial and contemporary history. This book has been written for a broad audience, it is copiously illustrated and presents developments jointly chronologically and partly thematically. The story of Norwegian subsea technology has both a national and an international market.
The term «offshore» introduced 1947

The first subsea BOP built 1960

Subsea drilling and production history
Ingrid Schjølberg, Ntnu: «Only a minor part of the oceans have been explored»
• There has been activity at and in the sea for as long as we know

• There will be a multitude of sea based activities for all foreseeable future

• Subsea remote control, subsea autonomy and subsea drones are key tools for unlocking new potential and for monitoring and controlling that the old and new ocean industries operate in a sustainable manner.
Drill support - diving

Compl. supp - diving

Thereafter, from 1980 - ROV

From mid 80-ies – ROV, ROT

New era-autonomy

Intervention techniques - historically
“Todd Newell, Oceaneering’s vice president for global engineering services, told a 2019 seminar in Stavanger that the NCS, with its density of fields and developed infrastructure, provided the company’s foremost arena for developing new technology which could later be exported to the Gulf of Mexico, west Africa and Brazil.”

(Getting down to it – 50 yrs of subsea success in Norway)
In 2019 Oceaneering and NOV Seabox initiated test activities in the fjord near the village of Tau near Stavanger independent of each other. Oceaneering established their Living Lab for long term development and qualification. NOV Seabox initiated deepwater tests of their seawater treatment and injection system.
Before subsea activities started, aerial drone companies established a test/training center in Tau.

KVS Technologies applies smart drones carrying out autonomous inspections and monitoring of power grids. Technology qualification and pilot training is done in Tau.
Tau Autonomy Center

Tau is located 30 min drive from Stavanger

Nosefo
(Norwegian center for offshore education)

- Infrastructure
- Offices
- Deep water quay

- Utility systems
- In-door test basin
- Mech workshop
- Test rig with helideck
Tau attracted aerial drones for several reasons

- Outside of airport control zone
- Scattered population
- Suitable terrain and objects in area
- Possibility to fly over both land and sea
- North Sea type helideck at Nosefo
- Close to Stavanger
Training rig with helideck and free-fall lifeboat
(formerly North East Frigg platform top)
Nosefo indoor training and test basin
As a result of the already ongoing activity in the air and in the sea, some of the users and suppliers involved in the activities decided to join forces and formally establish Tau Autonomy Center in the fall of 2019.
Tau Autonomy Center

- Low sea currents
- Minimum of swell
- Minimum tide
- Test area of 2 km².
The ambition is to establish a subsea training ground with the necessary infrastructure and mock-ups simulating realistic NS conditions.
“More than 450 delegates attended the biggest ever single gathering of international subsea robotic drone systems for use in the oil and gas industry the 2nd. - 3rd. October at TAU close to Stavanger. In addition, aerial drones, subsea seawater injection and a floating wind power research hub was demonstrated.” (Stinger Technology)
Stations:
1- Operational tent (UID operations and equipment)
2- UID vehicle expeditions (freedom and others)
3- Mingle tent (stands and presentations)
4- Air drones
5- Seabox SWIT
Seabed arrangement during demo days.

Autonomous docking to charging plate was demonstrated with success. (with different vehicle)
Eelume - Eelume
I-Tech 7 - UID
Kawasaki - AUV
Notiloplus - Sesam
Oceaneering - Freedom
Saab Seaeye - Sabertooth
Saipem - Hydrone
Stinger - ARROV
Seabox is moving the entire water injection plant from platform to seabed.

The prototype is undergoing final qualification tests prior to field application.
Synergy between air and sea systems

Birdview’s drone deploys transducer that can communicate with underwater systems. (from demo days)
Equinor and Saipem signed 40 mill euro contract for UID service for the Njord field (Equinor)
Equinor has a history of applying new subsea technologies

(Analyst Quest survey on 145 subsea technology projects 2012)
Ocean Viking
Akers Mek Verksted 1967
Discovered Ekofisk Oct 1969

Sea Quest
Harland & Wolf 1967
Discovered Forties Oct 1970

50 year anniversary – Congratulations!