



# FFU-Seminaret 2024

Subsea Technology to Demonstrate Capacity for a local Power Buoy

25.01.2023



# 4Subsea Astori As

## Vision

- Develop technology for the oil industry within increased oil recovery
- Become a preferred supplier of technology within control systems

## General info

- Founded in 2017
- 100% owned by 4Subsea
- 10 Engineers
- Engineering & Production facilities in Sandnes
- Engineering office in Krakow
- Main Customers:  
WDNO, DNO, Repsol, Neptune, Subsea 7 etc.

# 4Subsea Astori As

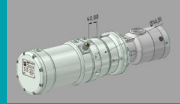
## Products & Solutions



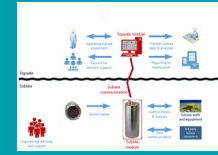
Subsea Control System



Intervention & Completion



Subsea Electronic Module



Well Information Management System

## Services and Technology

Topside Aux. Equipment

Subsea Instrumentation

Subsea Instrument Integrator

Well Information Management System (WIMS)

Subsea El. Valve Control

Well Stimulations

Subsea Communication Systems

Data Loggers

SEM Technology

Power Extension Module

In-house and of the shelf technology

SCM Technology

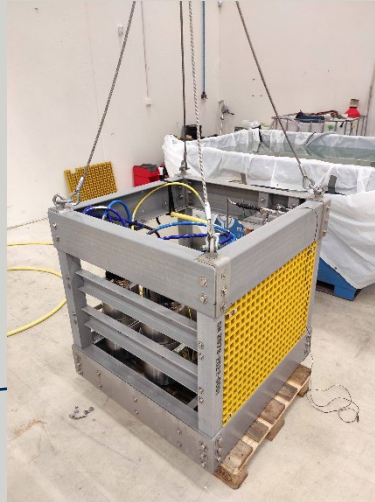
Instrument Integrator

# System Overview

Subsea Load System at Sea



Load Module & HPU



Topside Cabinet (SCU)



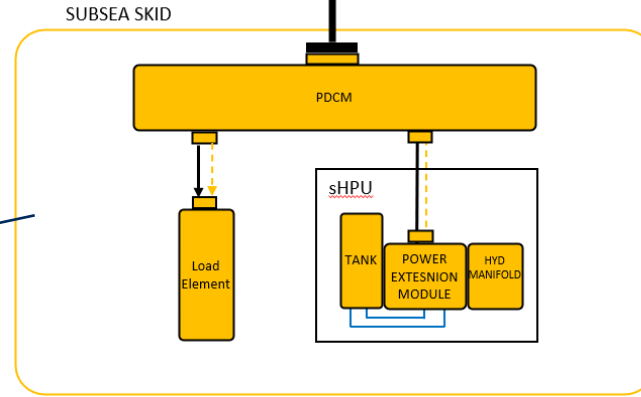
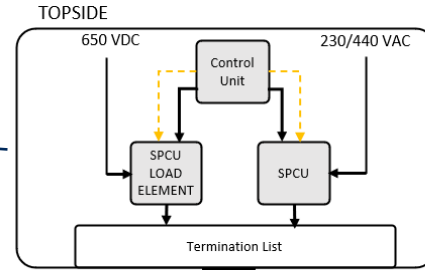
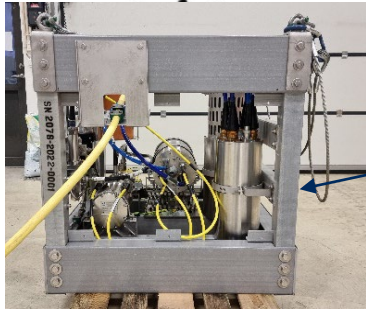
# Outline Scope of Work

- Design a System to Simulate the following functions
  - Autonomous Underwater Vehicle Charging System (EHTF)
  - Electrical Heat Trace Flowline (AUV)
  - Hydraulic/Chemical Pump System
  - Power Consumption: 0 – 35kW (1 x step 0-5kW, 6 x step 5kW)

# Design Parameters

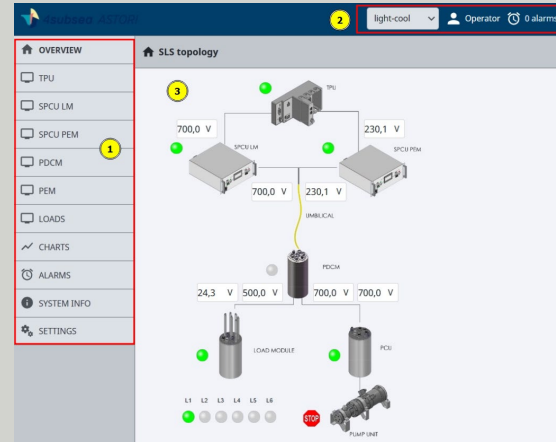
- Power Supply:
  - 230VAC – 1k
  - 650VDC - 35kW
- Water Depth:
  - 30m
- Umbilical Length:
  - 100m
- Control System:
  - Local/Remote Control/Operation
  - Automatic Load Control

# System Topology



# Operator/User Interface

- Standard SCADA Package
- Trend/Alarm/Event System
- OPC UA Implementation from Subsea to Topside
- Local/Remote Control

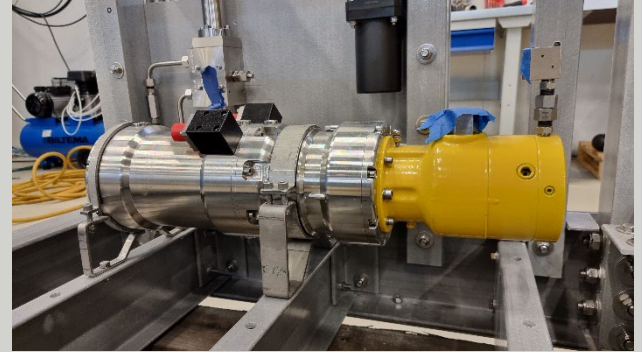


| SYSTEM SETTINGS              |       |
|------------------------------|-------|
| <b>Timeouts</b>              |       |
| Internal connection timeout: | 300 s |
| Remote connection timeout:   | 300 s |
| Device status - alarm delay: | 10 s  |
| <b>Load Module</b>           |       |
| Max Load:                    | 20 kW |
| <b>Motor</b>                 |       |
| Winding temp. warning:       | 75 °C |
| Winding temp. alarm:         | 90 °C |



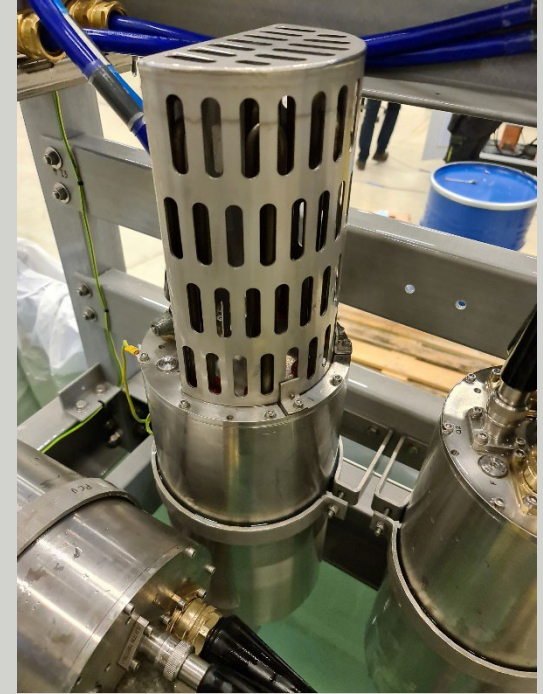
# Load Elements

- Motor/Pump Module
  - Power: 230VAC
  - Power Consumption: 5kW
  - VFD Controlled
  - Hydraulic Fluid: Water Based (HV443NO)
  - Pressure: 690bar
  - Flow: 3l/m at 690bar



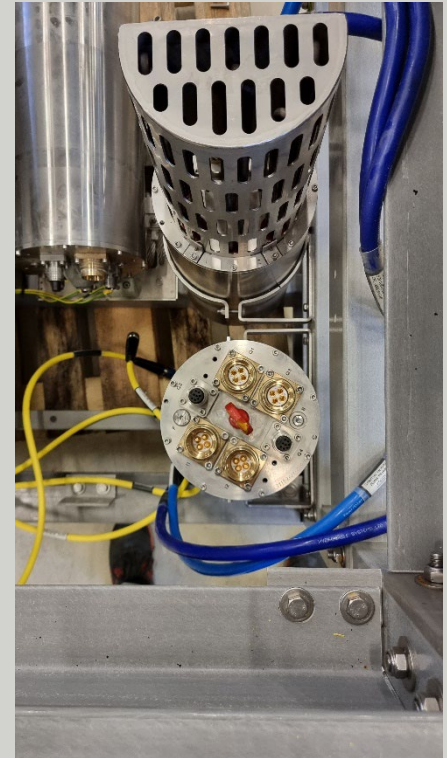
# Load Elements

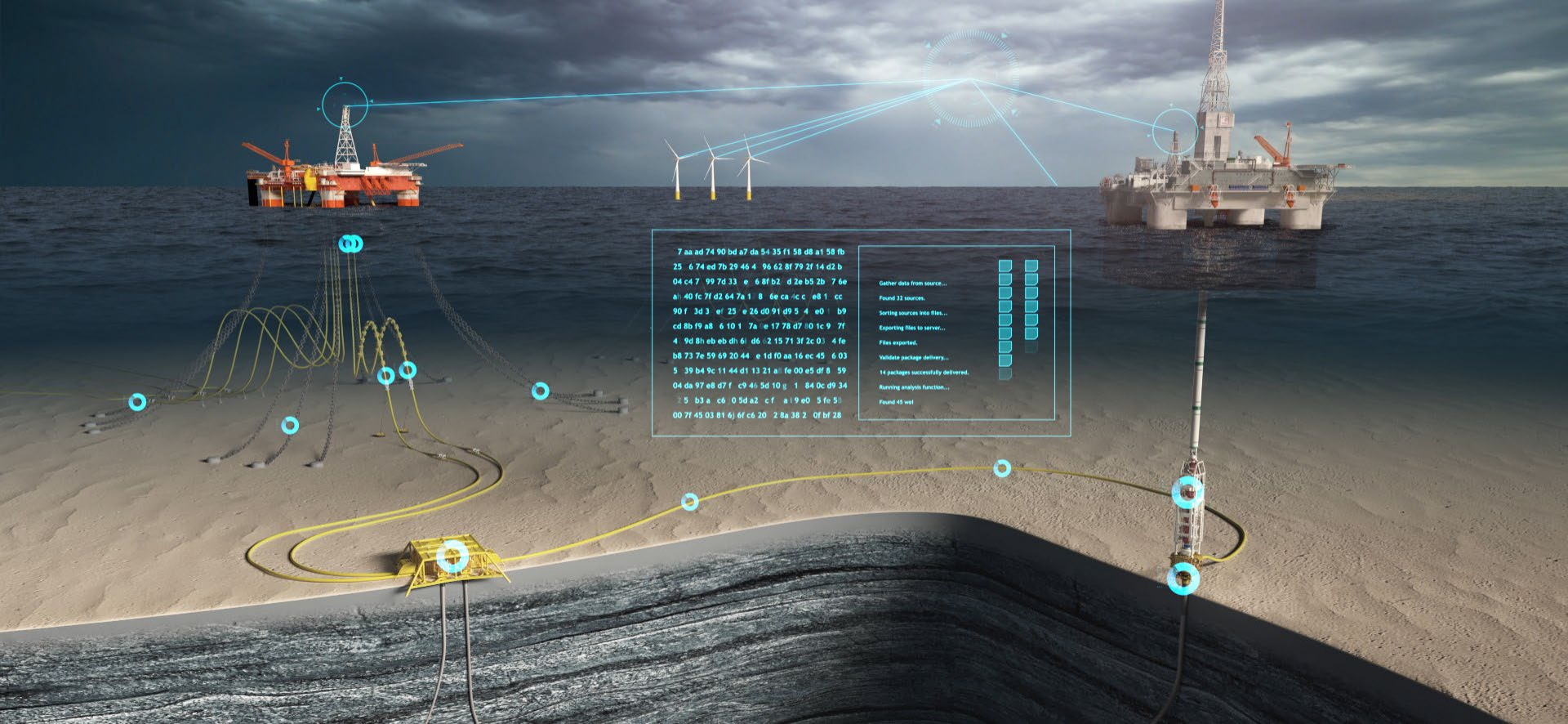
- Load Module
  - Power: 650VDC
  - Power Consumption: 0 -30kW in 5kW step
  - Internal monitoring power consumption



# Power & Com. Distribution

- Power
  - Power: 650VDC/30kW
  - Power 230VAC/5kW
- Communication
  - 100mb Ethernet
  - Convert from Coms on Power to Cat5





```
7 aa ad 74 90 bd a7 da 54 35 f1 58 d8 a1 58 fb  
25 6 74 ed 7b 29 46 4 96 62 8f 79 2f 14 d2 b  
04 c4 7 99 7d 33 e 6 8f b2 d 2e b5 2b 7 6e  
a1 40 fc 7f d2 64 7a 1 8 6e ca 1c c e8 1 cc  
90 f 3d 3 e1 25 q 26 d0 91 d9 5 4 e0 1 b9  
cd 8b f9 a8 6 10 1 7a e 17 78 d7 10 1c 9 7f  
4 9d 8h eb eb dh 6i d6 2 15 71 3f 2c 01 4 fe  
b8 73 7e 59 69 20 44 e 1d f0 aa 16 ec 45 6 03  
5 39 b4 9c 11 44 d1 13 21 a1 fe 00 e5 df 8 59  
04 da 97 e8 d7 f c9 46 5d 10 g 1 84 0c d9 34  
5 b3 a c6 0 5d a2 cf a 1 9 e0 5 fe 51  
00 7f 45 03 81 6j 6f c6 20 2 8a 38 2 0f bf 28
```

- Gather data from source...
- Found 33 sources.
- Sorting sources into files...
- Exporting files to server...
- Files exported.
- Validate package delivery...
- 14 packages successfully delivered.
- Running analysis function...
- Found 43 wet

Thank you.