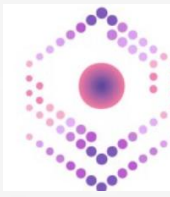




North Sea
Transition
Authority

In collaboration with



CO₂ Transportation
and Storage
Taskforce



Carbon storage monitoring (MMV)

Technology Showcase

Session 1

Net Zero Technology Centre, Aberdeen

29th October 2024

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CS Monitoring Technology Showcase 29.10.2024



North Sea Transition Authority

Morning

09:00	Arrival, registration and coffees
09:30	NZTC - Welcome and safety brief
09:40	NSTA - Introduction and keynote
Session 1: MMV technology selection for projects	
10:00	Storegga - MMV requirements and technology way forward - Findings of the CS Task Force
10:15	Spirit Energy – Monitoring strategies and technologies at Morecambe Net Zero
10:30	ExxonMobil - CS monitoring philosophy and onshore experience at LaBarge
10:45	TGS - Deploying monitoring technologies at European carbon storage projects
11:00	Shell - Induced seismicity monitoring for offshore CCS
11.30-12.45 - Technology showcase & networking (Sandwich lunch)	



Afternoon

Session 2: Geophysical and in-well technologies	
12:45	SLB – Monitoring technologies for Carbon Storage
12:55	TenzorGEO - Passive seismic/Microseismic monitoring during CO2 injection
13:05	Baker Hughes - Holistic approach to CCS site monitoring: safety & compliance through advanced MMV
13:15	Reach Subsea - Gravity and seabed displacement monitoring for CO2 injection
13:25	SpotLight Earth – Unlock predictive maintenance for CCS
13:35	Expro - Downhole monitoring for CO2 stores
13:45-14:30 - Technology showcase & networking (Coffees)	
Session 3: Well and marine monitoring	
14:30	Weatherford - Optical sensing in CCS surveillance
14:40	Metrol Technology - Downhole wireless monitoring for carbon storage
14:10	Halliburton - CCS as a dynamic system (and implications for MMV)
15:00	Quantum Pro – Intelligent tracers for CO2 geological storage
15:10	Fugro - Seismic, seabed and water column monitoring - Integrated examples from the US GOM
15:20	NOC Innovations – Autonomous monitoring service (AMS)
15:30 - Technology showcase & networking	

Thank you

Presenters



Organisers



Chaired by the NSTA and OEUK, the North Sea Transition Forum (NSTF) provides senior government and industry leadership for the offshore oil and gas industry <https://www.nstauthority.co.uk/about-us/north-sea-transition-forum-and-task-forces/>

Two of the seven NSTF Task Forces have greatly helped the organisation of our Technology Showcase today



- Addresses the key challenges and opportunities facing this new sector, facilitating dialogue between all stakeholders, and working together to deliver strategic direction and tangible results.
- Through the work of the Monitoring subgroup, published **Recommendations of monitoring technologies** earlier in 2024
- This report is available on the Taskforce web site <https://www.linkedin.com/company/co2-transportation-and-storage-taskforce/posts/?feedView=all>



- The TLB works with industry, regulators, and technology developers to accelerate progress and adoption of innovative solutions for the offshore energies
- CCUS is a priority area for the [North Sea Transition](#) Workstream led by bp
- Details on the TLB and its Workgroups are available on our website <https://www.the-tlb.com/>



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Carbon storage monitoring

Keynote

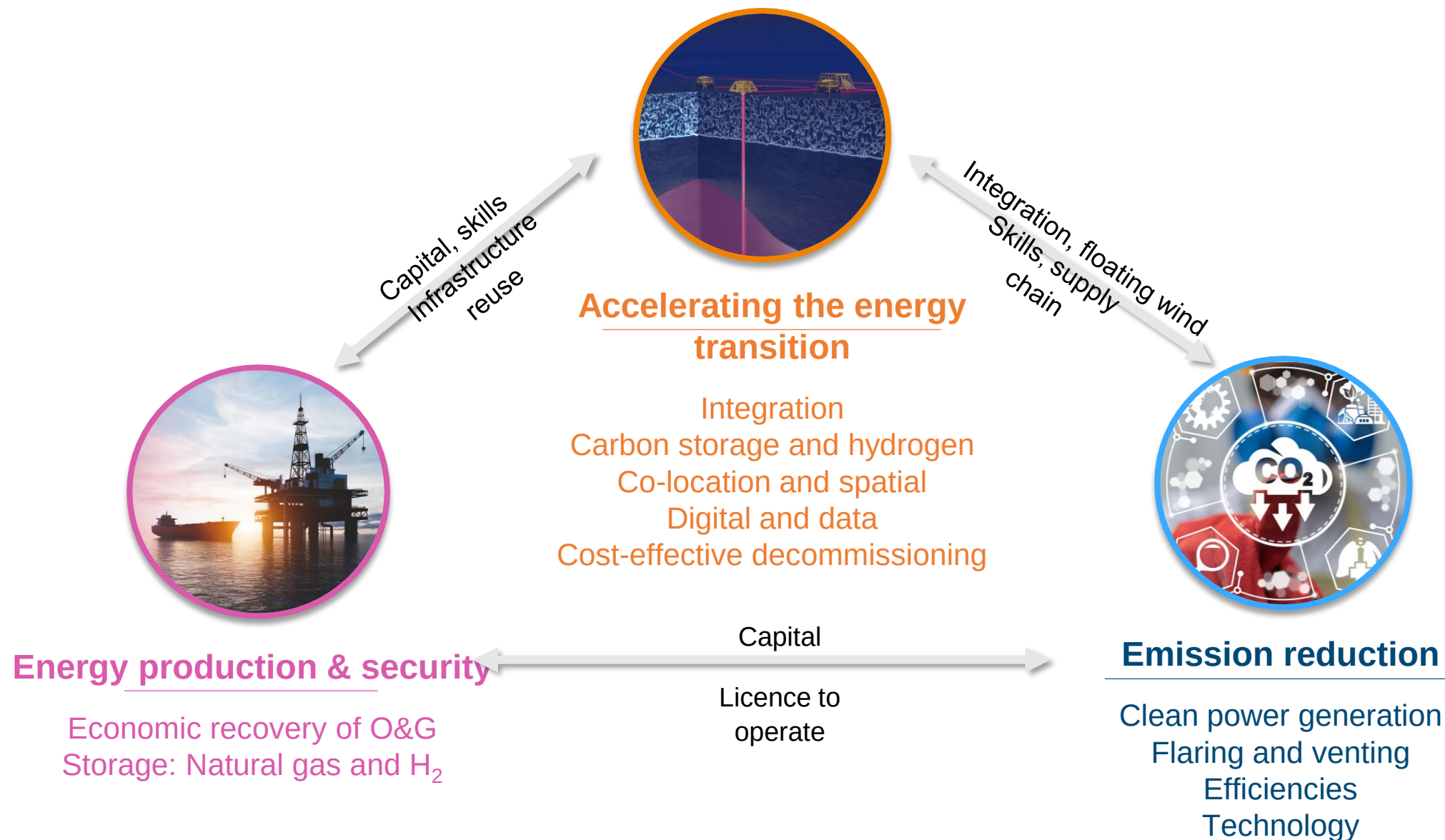
Ian Barron, Senior Geoscientist, Monitoring Lead

29th October 2024

UK Carbon Transportation & Storage

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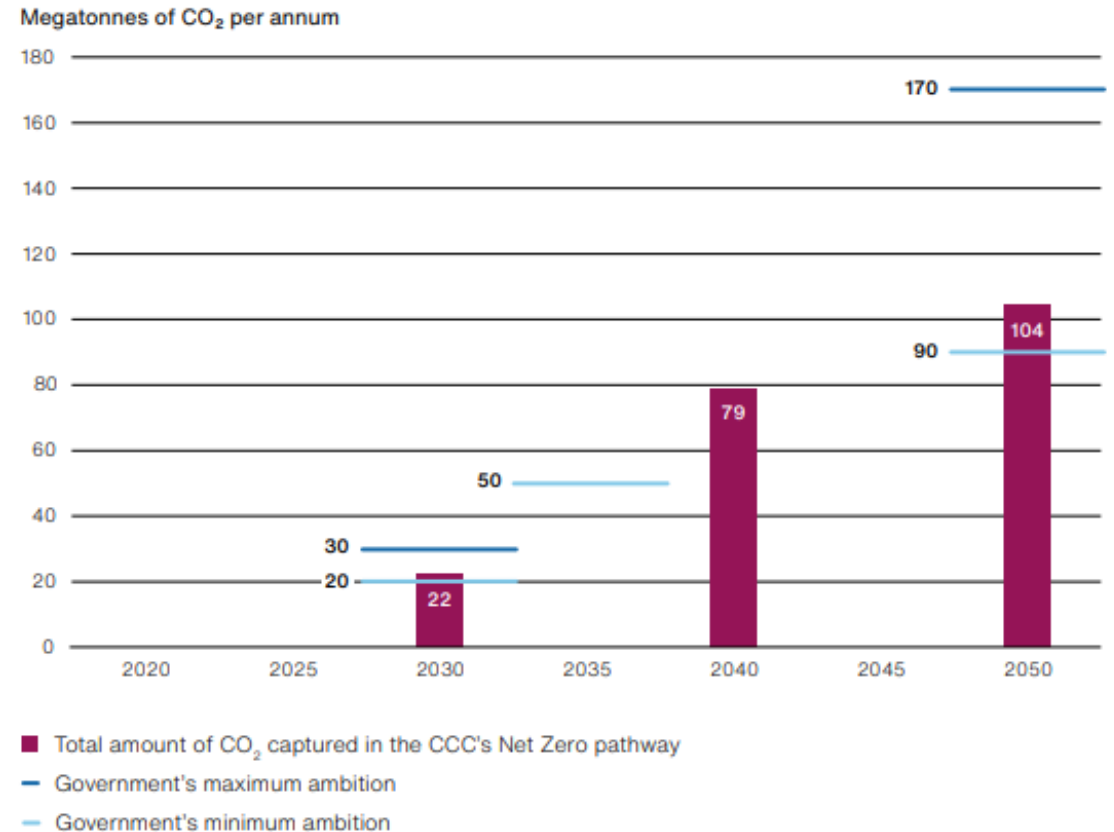
Carbon storage ambitions

- Significant deployment of carbon storage required to meet UK government targets
- Cost reduction is key as we move towards the government's vision of establishing a competitive market
- Monitoring is one area where ongoing operational costs have scope for reduction through application of new technology
- Cooperation between licensees, operators and technology companies will be key to reducing cost of new technology development and deployment
- Not replacing detailed feasibility studies for each potential store under appraisal, but to accelerate research and development of new industry-standard solutions
- **Focus on the right technology applied at the right time**

Figure 3

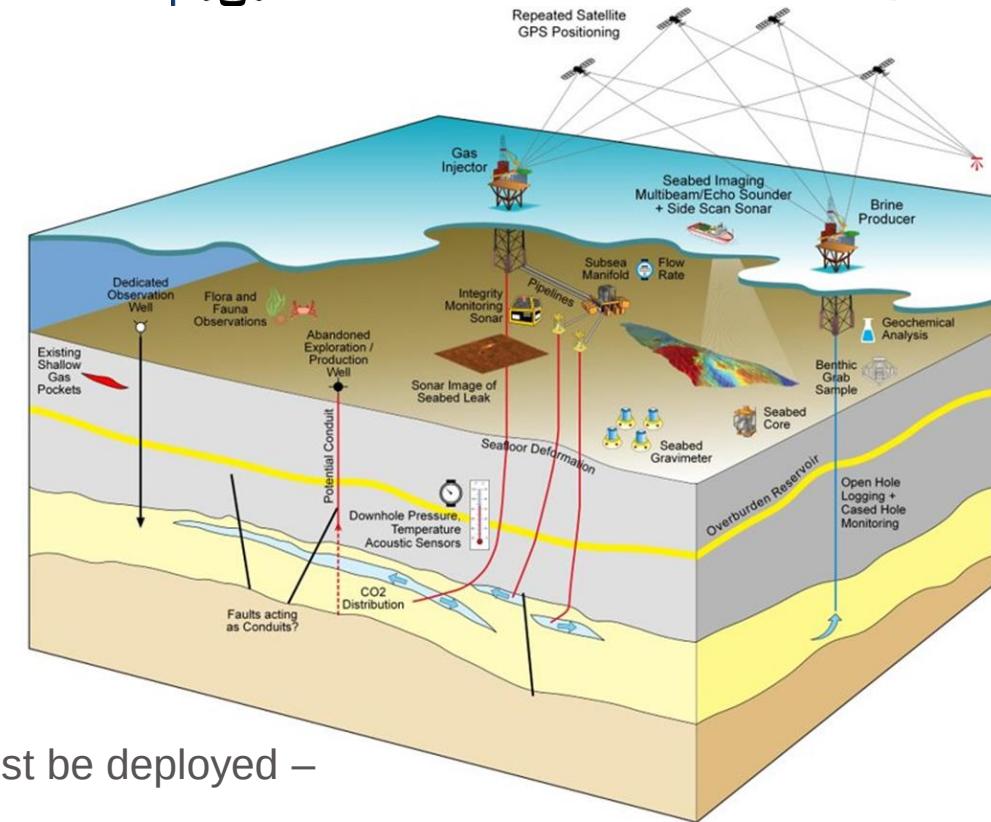
Climate Change Committee's (CCC's) assessment of how much Carbon Capture, Usage and Storage (CCUS) will need to be deployed under its Balanced Net Zero pathway, 2020 to 2050

If the government achieves its minimum ambition for CCUS deployment, this will be below the CCC's assessment of how much CCUS will be needed to achieve the Balanced Net Zero pathway



Monitoring requirements

- The UK CO₂ storage [regulations](#) require Monitoring to:
 - **Compare** the actual & modelled behaviour of the injected CO₂
 - Detect **significant irregularities***
 - Detect **migration*** of CO₂
 - Detect **leakage*** of CO₂
 - Detect any **adverse effects** on the environment
 - **Assess** effectiveness of any corrective measures
 - **Update** the Containment Risk Assessment
- The NSTA does not take a prescriptive approach to the technology that must be deployed –
 - No presumption of 4D seismic
 - “**monitoring must include** (where possible) the **monitoring of the CO₂ plume**, and (where appropriate) of the **surrounding environment**”
 - We consider each store on a case-by-case basis with respect to areas such as technology deployment and monitoring frequency (for example)
- The technology in the core plan should be proven; novel technology can be deployed alongside proven methods to assess suitability for later inclusion in the core plan
- Technology must be of an appropriate resolution (time and space) to detect significant irregularities or leakage



Technology showcase & networking

Exhibitors

Hub level

- | | |
|---|---|
| 1  | 8 
Baker Hughes |
| 2  | 9  |
| 3  | 10  |
| 4  | 11  |
| 5  | 12  |
| 6  | 13  |
| 7 
QuantumPro, Inc. | |



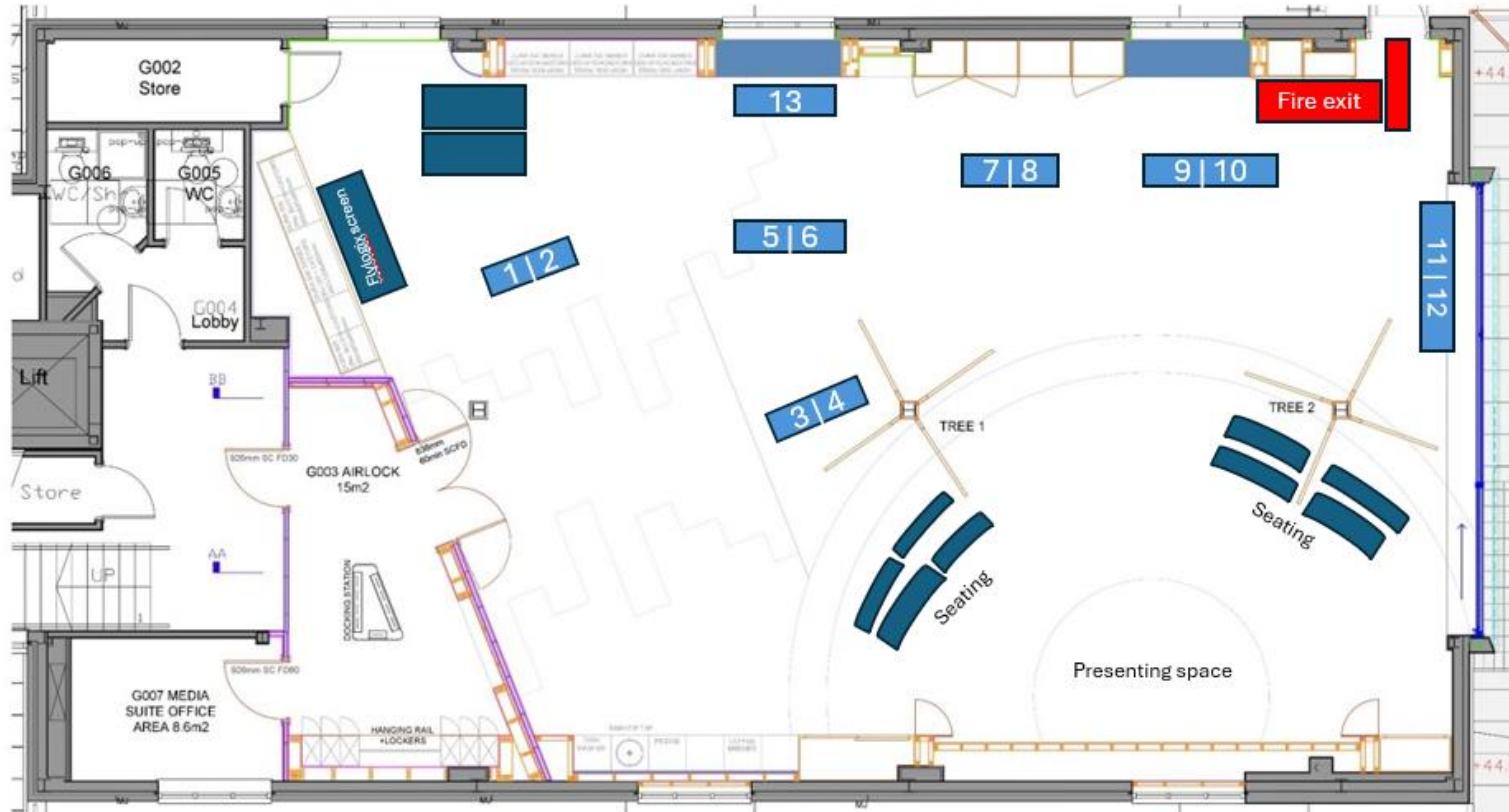
North Sea Transition Authority

Upper level

- | |
|--|
| 14  |
| 15  |
| 16  |
| 17  |
| 18  |
| 19 
Subsea Microseismic Technology |

Technology showcase

Hub level



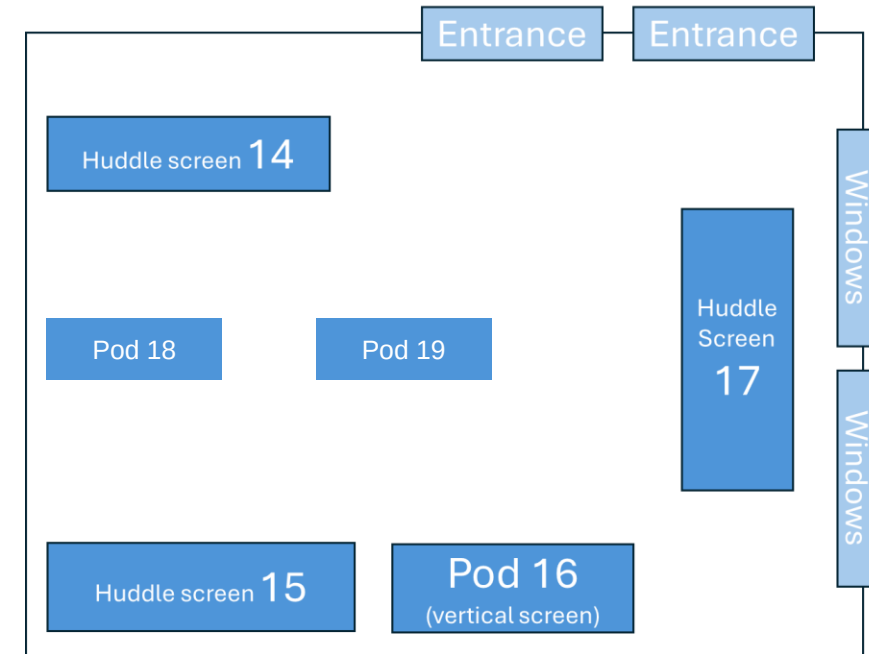
Pod 1 – TGS
Pod 2 – Sentinel Subsea
Pod 3 – SolGeo
Pod 4 – NOC Innovation
Pod 5 – Metrol Technologies
Pod 6 – SpotLight Earth
Pod 7 – Quantum Pro

Pod 8 – Baker Hughes
Pod 9 – Viridien
Pod 10 – Weatherford
Pod 11 – Expro
Pod 12 – Reach Subsea
Pod 13 – Halliburton



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Upper level



Pod 14 – SLB
Pod 15 – Silixia
Pod 16 – Cambridge Biomagnetics
Pod 17 – Fugro
Pod 18 – Sonardyne
Pod 19 – TenzorGEO