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Brevik CCS

Lessons Learned Report 2024 & 2025

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Executive Summary:

This report is a summary of the lessons learned collected from the fourth & fifth years (2024 & 2025) of the Brevik CCS project. During 2024 the remaining modules were installed and the project reached Mechanical Completion in December 2024. In the first half of 2025 the cold and hot commissioning was completed, with “ready for first ship loading” on May 9th achieved.

The lessons learned during this period of the project have been collected from multiple stakeholders and contractual partners. The input was then reviewed and reduced to the lessons learned included in this report. In summary the lessons learned in 2024 & 2025 focus on technical set up, project management, costs, environmental impact and health and safety, with specific lessons learned in the following areas:

- Mechanical completion challenges and recommendations for clear definitions and roles and responsibilities.
- Construction challenges with specific lessons learned on scaffolding and insulation.
- Operator training lessons learned.
- Commissioning and start up challenges and recommendations around staffing, processes and safety.

1 Purpose

This report is a summary of the lessons learned during the final years of the Brevik CCS project (January 2024 to May 2025).

The lessons learned have been collected through surveys and meetings and then evaluated and discussed separately by the project management team. This report has collected the lessons learned from:

- Brevik CCS project team members
- Brevik Plant personnel
- Brevik CCS hot commissioning team members
- Heidelberg Materials Northern Europe
- Heidelberg Materials – Competence Center Cement
- Project Partners
- Gassnova

The input was further refined down to the key lessons learned to be shared outside the project organization.

2 Project Progress Overview

On a high level, the following has been accomplished on the Brevik CCS project in the past one and a half years:

- The earned value progressed from 71% complete to 97% complete with only the acceptance test and completion of the Maintenance building remaining.
- 3 lost time injuries occurred on site in 2024 and zero LTI's in 2025 as of end of May, bringing the total in the project to 4 LTI's
- 609'755 man hours were worked on site in 2024 bringing the total to 1'198'719 manhours at the end of 2024 and as of the end of May 2025 1'339'580 manhours had been worked on the project.
- Three cost and schedule risk analysis were performed, CBS-06, 07 & 08
- The Desorber and modules 03, 04, & 05 were set in place in the first half of 2024.
- The third winter repair outage took place where the Gas Conditioning Tower (GCT1) was replaced. In the fourth winter repair outage, miscellaneous false air reduction repairs were done as well as the final tie-ins between the CCS and cement plants.



Site photo December 13th, 2023

The following specific challenges and/or changes in the project scope were encountered during the past year:

- The war in Ukraine has continued but has had no further impact on the project.
- The MC date, originally forecasted at the beginning of 2024 was achieved - December 1st, 2024 and readiness for first ship loading, scheduled to take place May 1st, 2025 was achieved on May 9th.

3 Technical set-up and performance

This section reviews technical aspects of the project, including design documentation, utility systems, and operator training. It focuses on technical challenges faced and the solutions implemented to ensure successful commissioning, start up and operation.

3.1 Cement plant P&ID's

The cement plant P&ID's should be updated at the start of project. This was not the case in Brevik CCS which created delays and confusion during the design stage and during commissioning. It is recommended that cement plant P&ID's are up to date and with required level of detail to indicate key instrumentation and to show battery limits with CCS plant and they should be controlled by the Engineering Manager within the project or have a clear focal point to coordinate any updates required throughout the project from the cement plant.

3.2 Integration between Cement Plant and CCS facility

The integration between the existing plant and the capture plant was well managed with a minimum of problems due to the high number of local Brevik cement plant personnel that were integrated into the commissioning and start up team. While this may not be possible in other locations, having people on the project team that have worked in the existing plant for years and know intimately the people helps to minimize problems.

3.3 Instrument air

Cement instrument air quality was insufficient for the required quality of air for the capture plant to function correctly. A higher standard is needed to be delivered reliably for the smooth commissioning and operation of the CCS facility. The cement industry in general is weak in this area as compressed air is not seen as a source of problems for a standard cement plant. It is recommended that an independent instrument air system be designed and installed for the CCS plant and not rely on any existing systems within the cement plant.

3.4 Operator Training Simulator (OTS)

It is recommended to establish an Operator Training Simulator (OTS). The process of creating the OTS itself has been educational for all involved, and the product is of crucial importance in connection with training and preparation for commissioning, start-up, and operation.

- Operator Training Simulator (OTS) provides a real time, full scale, simulation of the CCS-plant
- Process plant operators can train on operating the plant in normal and in extraordinary conditions
- The HMI (Human Machine Interface) and PLC logic is identical for both real control system and OTS, the OTS will therefore provide authentic training environment
- Important for optimization of startup procedures and preparations for commissioning

The OTS – operator training system – functioned very well in the virtual testing of the control logic. However, it was not perfect, and it was necessary to correct and update the control logic throughout the hot commissioning. Two lessons learned derive from this:

- Development of an OTS for the specific capture facility, incorporating the integration with the cement plant is highly recommended to early identify and solve control logic issues and to train the operators on close to real behavior of the plant before commissioning and

- Obtain the data sheets for all of the equipment and take the specific details into account as much as possible into the model. Data sheets should be made available to the owner as soon as they are available.

3.5 Ship Loading

The first loading of Northern Lights' ships, Pathfinder and Pioneer included the commissioning of the ship's CO₂ storage tanks with the CO₂ from Brevik and cooling down both tanks took up to 24 hours. The following lessons learned were captured after the loading of the ships several times:

- The total time to connect the loading arm and start transfer of liquid CO₂ (LCO₂) was longer than initially estimated. Connecting loading arm, purging, pressure testing, cooling down pipes, draining after loading, disconnecting the loading arm and signing documents. It takes time and requires one operator dedicated to doing this. Currently it requires 4 hours from the time the ship is moored before loading starts, and 2 hours for disconnection and documentation finalization and should be planned for.
- The differential pressure across the ship needs to be considered when designing the LCO₂ pump. A higher pressure than expected has reduced the LCO₂ transfer rate of the pump to the ship.
- Communication by radio with operators inside the ship was not possible, as there is no signal. An antenna needs to be added inside the ship to get signal from Brevik CCS radios to be heard in the control room of the ship.

3.6 Set Up of Maintenance Systems

Preparing the systems for maintenance has proven to be a formidable task, especially with SAP. This job was significantly underestimated, and it will require approximately 5 man-years to get this in place. Primarily, this concerns the technical structure in SAP. There are 3 levels: main equipment, sub-equipment, and sub-sub-equipment. All this equipment must be registered in a database (Excel) in such a way that it is suitable for import into SAP. Each piece of equipment is associated with a large amount of data and ensuring the quality of all this is very time-consuming. The import itself is also demanding.

It is important that the structure is 100% aligned within the company prior to starting the data entry into SAP. Once the technical structure is established, routines for preventive maintenance must be established for each piece of equipment at all levels. This is a significant task, even though descriptions are provided by the technology supplier.

4 Project Management and Execution

This section examines the project management strategies and execution methods used, with a focus on mechanical completion, commissioning, contractor coordination, and lessons learned in managing complex construction activities.

4.1 Mechanical Completion (MC)

The definition of MC needs to be detailed, and the roles and responsibilities of each party need to be identified early. Due to the lack of experience of HM on what specifically is required by MC and the accelerated handover schedule this could have been managed much better. For future projects the following recommendations are proposed:

- Define specifically how complete the insulation needs to be done for critical path areas. Can the installation be installed while the system is in operation? What scaffolding will be needed? Lack of definition in these areas created extra work and inefficiencies.
- Define the required cleanliness of pipes. How to validate cleanliness? Method of cleaning pipes? No clear definition was given, leaving it open to interpretation.
- Define the required cleanliness of area in general. How much scaffolding can remain? Dirt on tops of pipe? No clear definition was given, leaving it open to interpretation.
- Define what construction continues in areas that are in operation. And assess HSE implications of parallel construction and commissioning if that is intended to be done in the

project. Construction workers must be effectively informed that they are working on a process plant and not in a construction site anymore if that is the case, and access to areas and work permit system has to be regulated by the commissioning/operation team, which also requires additional resources.

- Prior to handover, single area walks with all disciplines shall be organized. Avoid having segregated area walks only by company or some of the contractors as this leads to misalignment and re-work.

It is recommended that Insulation boxes are only installed after leak checking of the valve flanges. The requirement for their installation as part of MC was not sufficiently clear so that rework was required when they had to be removed as part of the leak testing. This confusion was primarily due to schedule acceleration and achievement of milestone commitments. Special attention to be paid to packages which come pre-assembled as a skid. Either it is inspected by Company at the fabrication site before and during leak test, or flanges must be visible at site to perform leak test at site.

4.2 Leak test vs. Leak check

Contract specified leak check and Contractor used that to indicate that they did not need to perform leak test as part of MC. Company had to carry out such tests, especially for high-pressure systems where HSE concerns were highest.

4.3 Completion Specialist/Pressure testing Lesson learned

The following lessons learned were provided by the company that was the completion specialist for the oil industry specializing in pipe pressure testing, cleaning and general pipe construction /commissioning activities.

- The piping design should consider pressure testing or cleaning. Very complex pipe routing, no drains – which made their work more time consuming and expensive. It is recommended to involve the use of a specialist completion services company to review the piping design early so that small changes can be made at low cost and give tips to make the completion work easier, such as.
 - shifting reducer locations to allow for longer straight sections for cleaning (soft pig – very inexpensive method)
 - adding drain points so that draining after pressure testing is easier.
 - review the pressure testing concept – use of flanges, vs. N2 testing, vs. golden welds, etc...
- Define the pipe cleanliness required for the different systems. From “remove loose debris” to “bare metal” scale. The question “what is clean enough?” should be answered early as it will impact the pressure testing method.
- Pipe dryness – should also be defined early – this was left too long in Brevik and many meetings were held just to agree on this. Easy to include statements early in the project but when it becomes critical path everyone argues over little details.
- “Golden weld” or a weld that doesn’t need pressure testing due to the higher weld testing requirement – should be considered on pipelines that with highest man hours for insulation installation. This is due to the delays the project is faced with the requirement pressure testing must be done before it is insulated.

4.4 Commissioning

Early commissioning of utilities - The early commissioning of any available equipment helped to provide the necessary time to rectify any operational issues such as the demineralized water system, the effluent water treatment, potable water supply and the instrument air system. The more these systems are separated (distance and electrically) from other systems the easier the early commissioning is.

System leads - the commissioning organization that was structured into System Leads for the respective main commissioning systems of: Steam and Condensate, CO2 capture plant (amine), CO2 compression and liquefaction, Integration with the cement plant and Utilities systems (instrument air, plant air, cooling water, potable water, effluent water treatment plant). This organization was effective, and the following lessons were noted.

- Recommended to use Owner's personnel for these key positions and not 3rd party contractors. The level of commitment needed is quite high as significant overtime will be worked. In addition, the use of owner's personnel ensures that the valuable knowledge gained during commissioning is not lost.
- It is recommended that each area leader is assigned a supporting project engineer to assist with the workload. There is a high demand for documenting and reporting issues to the contractor during this phase, in parallel to operations that require more than one person per system to be effectively managed. For this assignment to be successful, the person should be assigned early in the project (during cold commissioning) and remain on site for the duration of the hot commissioning.
- Where possible it is helpful to embed qualified plant personnel into the project team and provide replacements in the cement plant operation. Bringing in either external personnel or engineers from head office are more expensive and less effective often due to having to work away from home for long periods.
- The use of key experts was critical on the project and their specialized knowledge greatly advanced the project during critical periods. It is recommended that these experts are identified early in the project and integrated into the commissioning team.

Winter conditions - the identified frost risk early in the project was quite valid and only with special attention to the risk was it mitigated. In addition, the warm winter also greatly helped the situation, and if it was a colder winter the extra efforts would not have been sufficient.

Pump seal failures - the seals failed on 4 pumps and although this was seen as an unusual event by the supplier, it is recommended that in future projects standard seals are selected (rather than special ones with no spares) and sufficient spares are in stock.

CO2 Compressor – alignment of inlet and outlet pipes to compressor took considerably longer than planned (6 extra weeks). Due to the very high speeds of the integrally geared compressor, no stress can be transmitted to the inlet and outlet flanges of the 7 stage integrally geared centrifugal compressor as they may distort the gearbox casing. In addition, the pipes connected to the compressor must allow for thermal expansion which makes it difficult to check the loading until after the system has been run and heated up. This is a known challenge among the compressor suppliers however the suppliers do not readily admit it. Similar problems were reported at Boundary Dam CCS project and the Petra Nova project but even knowing this in advance did not help as this is a known risk that the compressor companies accept. Therefore, the recommendation is that sufficient time is allocated in the schedule for this activity and it is highlighted as a known risk.

Cold commissioning software system – suggest adopting the contractor's and agreeing on costs and access to it early. HM tried to use a different system which didn't work well with contractors. Risks are that if the work is subcontracted to a large construction company, they also have their own systems – which need to talk to with selected one.

Hot Commissioning Meeting frequency – During the more than 3 months of hot commissioning, a daily 30-minute meeting was held each morning and was attended by up to about 30 people. During the meeting the upcoming activities for the day were discussed and any new developments from the day before. A short email to the attendees was issued after each meeting. See example from March 18, 2025, below:

Responsible	Points of attention today
Steam & Condensate	Sample point is WHRU1 to be checked.
Amine and integration with cement plant	- Check leak in lean amine pump drain. - Assess requirement to flush lean/rich exchanger prior visit of Kelvion, next week. - Need to implement clinker dust injection upstream ID fan.
System Lead Comp. & Liq.	- MAN expert to be at site today. - Actuated valve in B060 turned and tested yesterday. Turning of actuated valve in B340 tomorrow, preparation starts today. - Leakage in B340 to be investigated again today. - Locking of CO₂ pumps for purging is being investigated with Flowserve. - WW supply to flash vessel to be inspected today. Removal of insulation box coordinate with Aker.
E&I	HV supply to compressor solved.

Ad-hoc meetings were organized as needed to discuss specific issues with relevant people only. This way, the number of meetings was kept to a minimum, which is desirable in such a busy period.

Co-location of Commissioning teams – Initially in the project each contractor and the owner had their own separate construction trailers for offices, which in addition were several hundred meters apart. This was partly due to the availability of space on site and the lack of trust between the contractual partners. In the final year of the project, the decision was made to combine the offices of the main contractor and the owner. The owner paid for the relocation of the construction trailers and the change was very beneficial for the project communication. Having closer proximity to each other greatly improved speed of communication as well as the level of cooperation between the parties. It is recommended that in future projects this is done as well. In general, eliminating reducing physical barriers creates the sense of one team, while physical barriers promote silos behavior.

4.5 Mechanical Completion Criteria

Avoid grey areas in the MC definition and be clear on who performs what. The following issues were identified during the project:

- Witness testing during any flushing activities on pipes is very difficult
- Drying of LCO₂ systems was not explicit in the contract.
- Chemical cleaning of columns packing needed to be done by Contractor but was only possible during commissioning by Company.
- Cleanliness criteria in Cement plants is very low compared to cleanliness criteria in chemical plants needed at MC, both, inside and outside pipe and equipment, but also the floor, etc.
- The contract was not very specific regarding cleanliness; it only mentioned that the plant shall be delivered with a cleanliness level “fit for purpose”. It is recommended to clearly state in the contract what clean means. Refer to industry standards for example.

4.6 Operator Training

Additional time was required to expose each operator to the startup and shutdown sequences as this was the most challenging situation for them to learn, and they could not be independent until they had the confidence to start up or shut down the plant on their own. It is recommended that the commissioning schedule takes that learning curve into account and allocates sufficient time to allow

all shifts to have exposure to startup and shutdown as the commissioning of the different systems progresses.

4.7 Scaffolding

Both the owner and contractor underestimated the quantity of scaffolding. It is recommended to hire more coordinators that have a good understanding of what the trades need to do their work. A person experienced in insulation to guide the scaffolders what insulators need, and someone with piping experience to guide them in what pipe fitters / welders need. The scaffolding was done on a reimbursable rate – and the comment from the workers when the scaffolding was put up in the correct way to do the work was that the work went so much faster.

4.7.1 Scaffolding & Insulation Lessons Learned from contractor

One contractor was responsible for piping and insulation installation on the project site as well as off site in the pre-fab areas. They worked over 900'000 man hours on the project and executed over 11'000 job card packages. Their peak work level was around 15'000 man hours a week in February of 2024 and had people from 12 different countries on the project. The following lessons learned were provided by them;

- Recommend having a small scaffolding team on call to address small modifications to correct issues so that work can continue quickly rather than the full new job system that is used for larger scaffolding work. Scaffolding often didn't meet worker's needs – with the levels being at the wrong height or too close to pipes to allow insulation work to begin.
- Scaffolding activities were not included in the schedule at all which made planning for contractors more difficult and it is recommended to include major scaffolding in the schedule.
- Insulation requirements were too detailed and complex, with several different types of insulation systems and products, cladding types and clamps. This led to inefficiency in the work. In addition, it was felt that the requirements were too stringent.

4.8 Quality

Quality was never an issue in the project (HM team had little QA/QC on pipe welding) but a high quality was delivered due to the culture as it comes down to the individuals. HM should not assume this exists elsewhere and ensure proper QA/QC systems are in place.

4.9 Shift hours

The workers were only interested in projects that allowed them to work two weeks on two weeks off. Then they would go to another project during their "off" time. The working shifts need to be planned early in the project as it has a cost and productivity impact. This also has a retention impact and consistency of work crews that contractors should consider in their hiring policy and be aligned early.

4.10 Module Fabrication & Equipment installation lessons learned from contractor

The following lessons learned were provided by the contractor responsible for the installation of the mechanical equipment as well as the structural steel for the modules and pipe support systems.

- Module planning – more tolerance should be planned for when considering the outer dimensions of the modules for the allowable space that they are to be set in. In Brevik they had an allowance of 20 cm and in the end, it cleared by only 5 cm due to module 03 leaning slightly when it was lifted.
- Multiple contractors on site required a lot of coordination and often the key messages didn't get distributed to the site teams. The morning daily meeting was used to basically inform the contractors what was happening that day on site. A recommendation for future projects is to have this information posted online so that it is easier for the different contractors to be informed.

5 Costs

This section discusses a summary of cost-related lessons, budget variances, cost drivers, and recommendations for more accurate forecasting and cost control in future projects.

5.1 Insulation

The insulation installation was far more work than expected and the costs higher than budgeted, partly due to the selected insulation system that proved more difficult to install. It is recommended to evaluate the differences between paying more for an easier to install insulation vs. the additional labour costs for the installation. Having people specifically knowledgeable in insulation and the challenges of installing it, on the project team during the FEED and detailed design can help get a better understanding of these challenges.

5.2 Accommodations

The cost of accommodations for the contractor was far higher than planned. Due to a high number of projects in the area the local accommodation was quite full. In hindsight they should have committed to more rooms early (underestimated number of rooms and cost).

5.3 E&I

The electrical construction was managed by HM and in the manner that most cement project electrical work is done. Specifically, the team field ran all cable, cable trays and instrument tubing. No drawings were prepared for routing of cables and instrument tubing. This only works if electrical team is used to this – however it was a very cost-effective way to do it. In the end the results were fine for everyone.

5.4 Use of specialized companies

The use of specialized companies worked very well. Specifically, specialists were used for, all heavy lifts, pressure testing, pipe labelling, and welding. The higher cost for these firms paid off in terms of quality and schedule.

6 Environmental impact

This section addresses environmental considerations, including noise management and other impacts observed during commissioning, along with recommendations for minimizing environmental footprint in similar projects.

6.1 Excessive noise when venting CO2

Excessive noise when venting CO₂ – no silencers were installed on the CO₂ tank farm as the design considered that this would be required only rarely and, according to the contractor, the valve supplier indicated that the noise level will be below the threshold defined for the project. However, as part of the commissioning process the Nitrogen in the CO₂ tanks had to be purged which was quite loud. The commissioning team had to reduce the flow rate considerably to keep the noise low and even a temporary silencer was installed to address this issue. Moreover, after the system has been commissioned, intermittent venting of CO₂ vapor also takes place, leading to higher than design noise. The lesson learned is to consider these high noise sources when planning the commissioning and if in a noise sensitive area and include silencers by design that are suitable for the service (steam, CO₂, others).

7 Health and safety

This section highlights the health and safety practices adopted, challenges encountered, and the effectiveness of safety culture initiatives, with a focus on regulatory compliance and continuous improvement.

7.1 DSB (Norwegian Directorate for Civil Protection) consent

Consent from DSB is needed for the start-up and operation of the CCS facility. It must be documented that the facility has been constructed/built in accordance with the 2014/68/EU Pressure Equipment Directive (PED) and Regulations on the handling of flammable, reactive and pressurized substances as well as equipment and facilities used for handling

It is also a requirement from the Norwegian authorities that an assessment is carried out by a third party (Notified Body). Both Contractor and Owner chose Kiwa as Notified Body. Based on individual Declaration of Conformity Compliance (DoC) (Samsvarserklæring) for each sub-assembly, component, equipment, etc. and applicable CE-marking, the Completion Inspection Report (Ferdigkontrollrapport) can be prepared. Before the Completion Inspection Report can be made, the DoC for assemblies i.e. Compressor package and Reclaimer package. The Completion Inspection Report is the final deliverable and includes:

- Design control
- Installation control
- Control of safety critical functions
- In addition to reviewing relevant documents, some physical inspections are required

The following Lessons learned were collected on this subject;

- Obtaining sufficient documentation for the Notified Body, holding meetings, inspections etc. has proven to be more time-consuming and extensive than first thought. In the future, it is important to start this work early and demand a detailed SoW from Notified Body before entering a contract
- Personnel chosen to do the work with the Notified Body should have good knowledge and experience of both Pressure Equipment Directive (PED) and Regulations on the handling of flammable, reactive and pressurized substances as well as equipment and facilities used for handling. HM had insufficient experience with the Pressure Equipment Directive (PED) and in working with the Norwegian authorities.
- Mere days before the start of ship commissioning, the DSB chose not to follow the recommendation of the Notified Body which created additional costs and delays to the project. Due to lack of experience HM was unable to react quickly to address this issue or change its outcome. It is therefore recommended that the project team educates itself early in the project on the specific country requirements for the necessary PED certifications.

7.2 Site Safety

Emphasis has been placed on a good working environment where cooperation and a good tone have been implemented at all levels. This has contributed to an open safety culture where information is not withheld but flows easily to the sources that should have it. Building such a safety culture has been very successful in the CCS project. Feedback from surveys as well as during safety rounds or inspections indicates the same.

A good safety culture was built in the project by providing the employees with information about transparency in the handling of deviations, by making it clear to the employees that they are not responsible for mistakes but that there are causes that the project will correct. Explaining the learning curve in the event of errors, we also measured the psychosocial working environment monthly. Furthermore, all feedback from employees and the reports of deviations that came into the project were taken seriously. It was important to put this culture in place from the start in the projects and the classroom HSE induction course was used as the trigger for this understanding of safety culture.

With the philosophy of no blaming culture, i.e. finding the root cause and not placing blame on an individual, has worked in an excellent way. The number of registered nonconformities in the project is over 5300 at this time, which is extremely good also by Norwegian standards. The system cannot stand alone. It is paramount that activities in the system are followed up by a HSE-manager or

similar. The appointed responsible should however act as a facilitator and promotor; actual creation and closure of issues should be carried out by workers and foremen.

One lesson learned specifically to highlight, as several LTI's on the project has been due to slippery conditions due to snow and ice. The project has primarily been relying on the plant's existing measures to remove snow and ice thereby reducing the risk of trips and falls. After several winters it can be concluded that the plant's existing procedures for snow/ice removal did not suit the projects requirements and sheer number of people on site (450 versus maybe 60 – 80 people normally). Therefore, the project should have had a completely independent setup for snow and ice removal in common areas of the project.

7.3 Pressure Safety Relief Valves

Testing of Pressure Safety Relief Valves (PRV) – The PED requires that PRV's are tested on a regular basis (bi-annually), however it was recommended by the external commissioning consultants (from O&G industry) that all PRV's are tested prior to start up. This cost was not planned and the effort to remove all the PRV's (~80) and bring to a shop for testing and calibration was considerable. However, many of the PRV's didn't pass the test and needed to be recalibrated (even though they had been calibrated prior to installation during construction). Therefore, it is recommended that this step be taken in future projects as well.

It is recommended to clearly define in the scope of work in the contract what is to be performed in terms of leak test and by whom to avoid having such discussions during MC.

8 Conclusions and Recommendations

Based upon the lessons learned during the final years of the project execution, the above points are summarized:

- Many opportunities for improvement were discovered by HM in the areas of Mechanical Completion and Commissioning. Any company that also lacks the necessary in-house knowledge will face similar challenges and should look to mitigate them through clarification of roles and responsibilities and clear definitions of tasks.
- The setting up of maintenance systems and training of personnel is a major undertaking and should not be taken lightly. Provide sufficient resources early in the project to do these tasks correctly.

The uniqueness of these carbon capture projects such as Brevik, provides an opportunity to bring construction teams together with a common goal that is larger than the project itself. This is not usually the case in large CAPEX projects and should be taken advantage of in future CCS projects to help motivate all parties towards a successful outcome. Brevik was definitely a good example of where this happened.