



CUSTOMER CASE STUDY

Yamal LNG is the most northern liquefied natural gas project in the world, and used AVEVA to enhance collaborations in this joint venture

Yamal LNG - yamallng.ru/en/
Industry - Owner Operator

Goals

- Avoid delays that push work into the arctic wintertime
- Get all employees to adhere to the same standards

Challenges

- The need for checking documents manually every 3-4 months was time-consuming and error prone
- The climate made all set-backs dangerous and costly
- With so many partners, documents were hard to keep up-to-date and approved by all

AVEVA Solution

- Everything3D™ (AVEVA E3D™)
- AVEVA NET™
- ISM™
- Engage™
- Engineering™
- Diagrams™

Results

- Moving to a data-centric approach mitigated challenges at every stage of design and construction
- Using common systems between teams cut time out from between 'ready for startup' and full operation
- Six months' worth of savings in preparatory work

The Arctic Circle, Russia – Yamal is located deep in the Russian arctic, a region that is ice-bound for seven to nine months of each year. An integrated project, it encompasses natural gas production from the South Tambey Field, liquefaction and shipping. Yamal LNG, a joint venture of NOVATEK, TOTAL, CNPC and Silk Road Fund, is responsible for the operation of the project. PJSC “YUZHNIIGIPROGAZ”, a design and project engineering institute, acts as the engineering consultant for the terminal. It specialises in complex plants in polar regions.

An opportunity to increase project efficiency

Starting the new project, Yamal LNG and YUZHNIIGIPROGAZ saw several opportunities to use digital technologies to boost collaboration, avoid delays, cut project costs, reduce the potential for error and build a strong foundation to extend the asset's lifetime.

Yamal's location within the Russian arctic circle adds an additional challenge to the project, as even small delays can have a large impact on time scales if work is pushed into the arctic winter. To ensure project efficiency and stick to the demanding schedule, both parties had agreed to use a progressive approach to manage information transfer. However, they soon realised that transferring thousands of hard copy documents, which needed to be manually checked and validated every three to four months, was time-consuming, error prone and could have had future implications for safety.

This process also precluded the simultaneous and common review of documents by teams which were geographically dispersed. By moving to a data-centric rather document-centric approach these challenges could be mitigated at every stage of the design and construction. Both Yamal and YUZHNIIGIPROGAZ would benefit from a common standard for information transfer, to ensure that data is correct, complete and compliant at handover. Using common systems also offered the potential to cut time significantly between being declared ready for start-up and full operation, saving millions for each day that full operation could be brought forward.

Common information standards are key to successful co-operation

Yamal firmly believes that the use of information standards, accepted and adhered to by both parties, plays a key role in successful co-operation.

“It is impossible to overestimate the importance of standards. The more thoroughly you work on the standards you use and implement at the very beginning of your working relationship, the easier your life will be at later stages. We used the standards as the roadmap for all our work. We have imposed the standards we have developed on our engineering consultant and they are obliged to work to them. From our experience, we can say that these standards cannot be developed during the project, they should be applied prior to project kick off.”

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Project Data Leader,
Yamal LNG

The first task Yamal undertook after appointing YUZHNIIGIPROGAZ was to develop a set of common information management standards. The team shared them with the consultant and around 400 subcontractors. This ensured a consistent, compliant approach to engineering information across the project.

It also guaranteed that each contractor met the audit requirements for the project's contractual information standards and that any deviation from these was immediately flagged up by AVEVA ISM. The data was then exported via AVEVA NET, providing immediate access to all parties.

Adopting a data-centre approach promotes a shared project philosophy

“The engineering stage typically lasts between five and seven years but decisions made at this stage can dramatically influence the length of the working life of the plant, from operations to maintenance and onto decommissioning several decades later.”

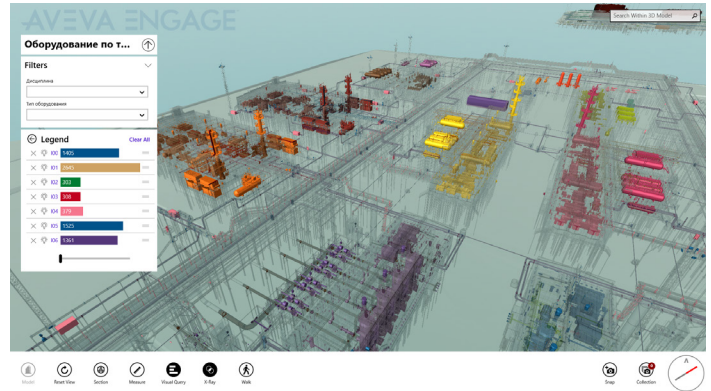
Project Data Leader,
Yamal LNG

An important decision, taken early in the project, was to introduce tools from AVEVA's Integrated Engineering and Design suite. This enabled the whole project to be created using AVEVA Everything3D. The digital version of the asset allowed pipelines, structural steel, equipment, cables and instruments to be fully incorporated into a 3D model.

Regular clash checking and reviews ensured that no errors were transferred to site and onsite rework was kept to an absolute minimum. AVEVA Diagrams helped to generate all the project and instrumentation drawings containing all tagged information. The fully integrated design tools ensured that the 2D and 3D designs were synchronised at all times.

A force for collaboration

In delivering the Yamal LNG, the project team used AVEVA Engage to review the 3D model together. This made it possible to look at different parameters, such as tags, equipment supplies and pipeline objects. The process was simple, using Engage's touch and swipe functionality. The live review meant that problems could be fixed without delay and amendments made.



Images courtesy of Yamal LNG.



“With AVEVA Engage, the model becomes almost physically approachable. It works faster than any other system we know and allows you to have a systematic view of the model.”

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Vladmir Kirillov

Saving six months in preparatory work

Both operator and the engineering consultancy have derived considerable benefits from the AVEVA platform. YUZHNIIGIPROGAZ point to an improvement in quality, as clashes are identified before they cause on-site problems and a collaborative review allows the challenges of both parties to be discussed and resolved.

Having a single, common source of engineering data prevents mistakes and misunderstandings. The software reduces timescales for engineering and design work, and procurement. In addition, it is also possible to establish operational readiness, to ensure that safety regulations are in order.

Yamal believes that AVEVA's ability to identify possible clashes has saved around six months' work on site. The team is particularly pleased with the AVEVA Engage capabilities, which allow them open and deep collaboration with an EPC, which helps to realise their holistic approach to delivering the project.



Images courtesy of Yamal LNG.

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