



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
Industry - Owner operator

Goals

- Avoid delays that push work into the arctic winter
- 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
- Moving to a data-centric approach mitigated
- With so many partners, documents were hard to keep up-to-date and approved by all

Solutions

- AVEVA™ E3D
- AVEVA™ Asset Information Management
- AVEVA™ Information Standards Manager
- AVEVA™ Engineering
- AVEVA™ Diagrams
- AVEVA™ 3D Asset Visualization

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 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 specializes 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 asset 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 realized that transferring thousands of hardcopy documents, which needed to be manually checked and validated every three to four months, was time-consuming, error-prone, and could have future implications for safety.

This process also precluded the simultaneous and common review of documents by teams that were geographically dispersed. By moving to a data-centric approach rather than a 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 cooperation

Yamal firmly believes that the use of information standards that are accepted and adhered to by both parties play a key role in successful cooperation.

“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 Information Standards Manager. The data was then exported via AVEVA Asset Information Management, providing immediate access to all parties.

Adopting a data-centric approach promotes a shared project philosophy

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 E3D. The digital version of the asset allowed pipelines, structural steel, equipment, cables, and instruments to be fully incorporated into a 3D model.

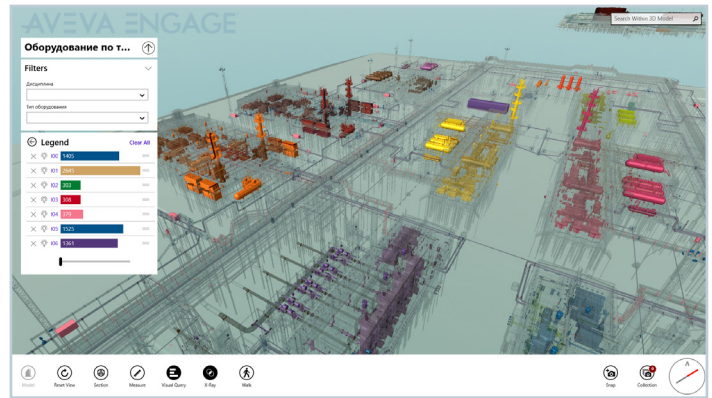
The engineering stage typically lasts between five and seven years, but decisions made at this stage can dramatically influence the length of the working life of the plant, from operations to maintenance and onto decommissioning several decades later.”

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Project Data Leader
Yamal LNG

Regular clash checking and reviews ensured that no errors were transferred to the 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 synchronized at all times.

A force for collaboration

In delivering the Yamal LNG, the project team used AVEVA 3D Asset Visualization 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 AVEVA 3D Asset Visualization's touch and swipe functionality. The live review meant that problems could be fixed without delay and amendments made.



Images courtesy of Yamal LNG





Saving six months in preparatory work

Both operator and the engineering consultancy have derived considerable benefits from AVEVA solutions. YUZHNIIGIPROGAZ points 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 software's ability to identify possible clashes has saved around six months' work on site. The team is particularly pleased with the capabilities of AVEVA 3D Asset Visualization, which allow them to collaborate seamlessly with EPCs and helps them to realize their holistic approach to delivering the project.

“With AVEVA 3D Asset Visualization, 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