NEOSYNTEZ

Managing the Lifecycles of Complex Plants

NEOSYNTEZ is an EDMS (Engineering Data Management System) tool for reducing the complexity of understanding operations at industrial and civil construction facilities. Our software stores, accesses, and analyses data during the entire life cycle: design, construction, operation, and reconstruction.

NEOSYNTEZ encompasses the information model for facilities that you are designing and building. It provides you with a dynamically adjustable facility structure, attributes, multiple links, and makes multi-criteria queries.

You access NEOSYNTEZ through today's Web browsers. This provides you with needed information promptly, at any time from any place with a network connection, and from any device that can run a Web browser.

NEOSYNTEZ as Common Access Point for All Users

NEOSYNTEZ unifies many different pieces of information about the facility into a single information environment. It handles research, design, construction, operations, repair, and sub-contractor functions equally well.

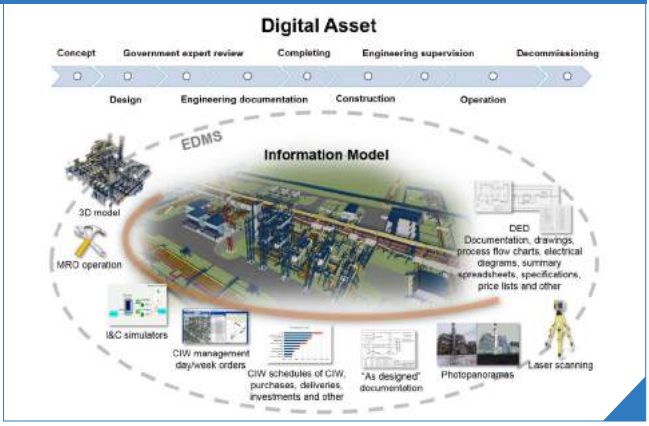
Our system has outstanding flexibility. It integrates seamlessly with the other software tools developed by NEOLANT Group, as well as ones you use made by third-party vendors. It couples fast computing speed with an easy-to-use interface.

NEOSYNTEZ Creates Digital Asset Solutions

NEOSYNTEZ provides you with simultaneous overviews of processes, financials, configurations, and scheduling. It updates and adds data continuously at any point in time. The virtual facility prototype is created as a **digital asset**, and so you now have the basis for making error-free engineering and management decisions.

With digital assets available through any Web browser, your team gains enhanced manageability, transparency, and predictability of the design-build-operate processes at all stages of the facility's life cycle.

Transparency encourages better decision-making, thus **attracting investment and reducing the cost of business insurance**.



Example of how NEOSYNTEZ presents information in a variety of formats

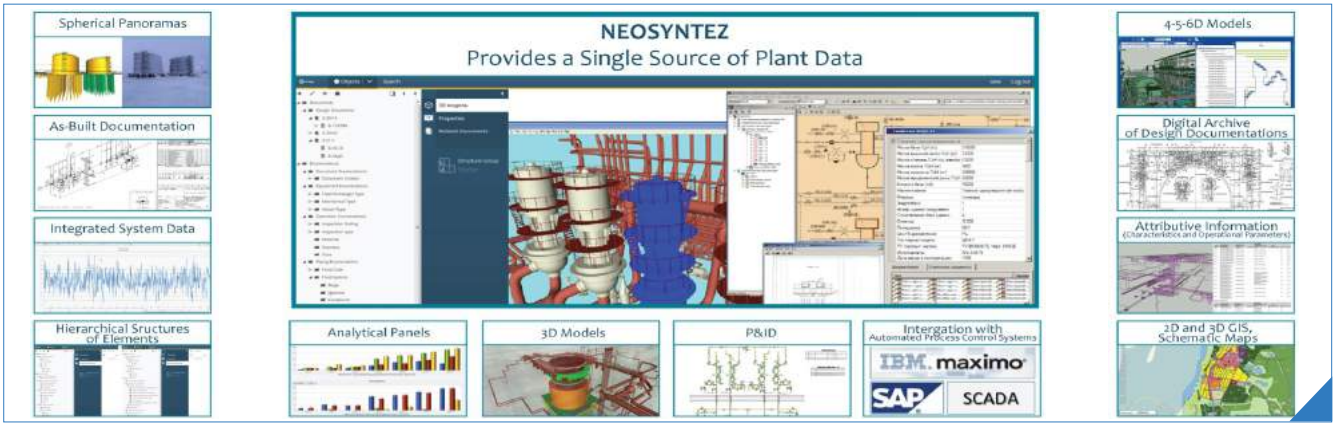
Here's how:

In the first case, potential investment partners gain immediate access to centralized information. Based on what they learn, they are able to justify their conclusions regarding the actual state and reliability of the facility. The plant attracts larger investments by encouraging the interaction of all stakeholders. The investment firms can perform more accurate financial assessments and form the most favorable contact terms.

In the second case, the easy access to centralized information may have the benefit of reducing insurance rates.

NEOSYNTEZ Reference Customers

- Microelectronics for Military-Industrial Applications: Angstrem-T manufacturing sub-micron semiconductor elements
- Nuclear Weapon Complexes: ROSATOM: JSC FCS&HT "SNPO "Eleron", FSUE PA Mayak
- Nuclear Industry: ROSATOM: Rosenergoatom Concern JSC: Bilibino NPP, Kursk NPP, Leningrad NPP, Smolensk NPP
- Expertise abroad: NPP Kozloduy (Bulgaria)
- Hydropower Industry: RusHydro
- Oil and Gas Extraction: Gazprom Neft PJSC
- Oil Refineries: Rosneft PJSC: Bashneft-Novoil JSC, Ryazan Oil Refinery Company JSC
- Civil Construction: Multi-purpose Health Center Grand Medica



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Step 1. Structuring the Engineering Data Archive

Integrating Data from Different Systems

Data consists of general properties and current operating properties of equipment, along with the mass and volume of components, data on materials used at the facility, topology information about the facility's location, data on activities carried out specific to components, and so on.

Any type of facility IT system, such as ERP, MES, PM, MRO, CAD, and APCS, can be a data source for NEOSYNTEZ.

Interactively Visualizing Data

NEOSYNTEZ displays data interactively in a variety of flexible formats. You can visualize and analyze data through the following means:

- Tree view of facilities
- Digital documents
- 2D general layouts, processing schemes, and electrical diagrams
- 2D and 3D GIS
- 3D-4D-5D-6D models
- Spherical panorama images
- Analytical panels and time-lines
- Combinations of formats

Through NEOSYNTEZ, you select the best way to present information to most effectively make decisions on any task.

Accounting, Storing, and Managing Facility Information

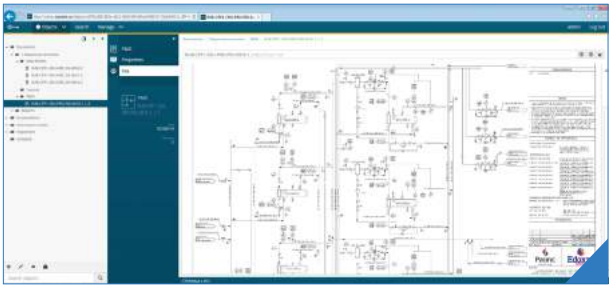
- Accounting for and storing heterogeneous data with different attributes, yet able to connect objects and related documents
- Accounting and classifying facility data flexibly; no development required, nor changes to data structures to meet needs of different facility services
- Developing tree-like hierarchies of groups of objects of any complexity
- Developing alternative trees for divisions like architecture, construction, and operations
- Transiting quickly and seamlessly between representations of facilities

Data Management

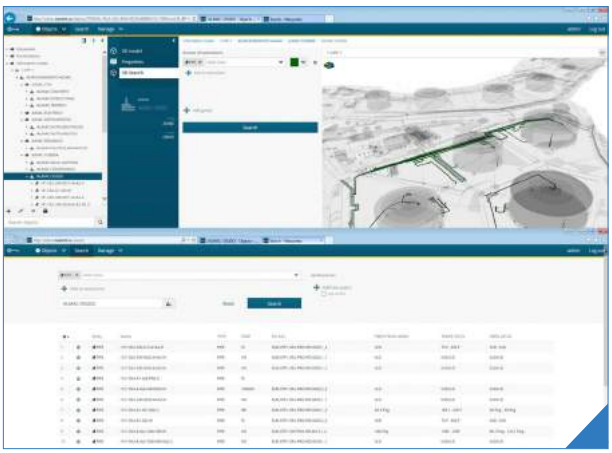
- Viewing attribute data about each element of the facility information model
- Searching facility information model elements by attribute links, visualization of results, user queries, and user-defined report generation
- Measuring distances, angles and areas, reading coordinates and dimensions of specific model elements
- Cutting model cross-sections with dynamic orthogonal planes
- Generating specifications of selected facility model elements automatically
- Synchronizing results from different data representations

Accessing data of a tank through 3D models and P&ID

Customized facilities tree in NEOSYNTEZ



Displaying the electronic documentation archive in NEOSYNTEZ



Generating a specification for selected elements in NEOSYNTEZ

Step 2. Solving Practical Facility Issues Throughout the Life Cycle

NEOSYNTEZ saves **millions of dollars and months of effort** through effective facilities management. This is made possible through the combination of significant functions during the following stages of a facility's lifecycle:

Effects on Operations

- **Unification and standardization of equipment databases**
  - Maintaining a central general register of equipment, including equipment specifications
- **Mitigation of human factors on equipment operations and maintenance**
  - Recording daily operating logs digitally
  - Recording walk-throughs and inspections of equipment with mobile devices and portable barcode readers
- **Reducing failures and equipment downtime**
  - Assessing the risk of accidents and accident related patterns to determine repair priorities based on the how critical the part is to the entire facility
  - Creating and updating reports for regional industrial safety standards and regulating authorities
  - Managing recourse features of equipment through integration with Automated Process Control Systems, online visualization, monitoring and analysis of observed values
  - Accounting and analysis of repairs under progress, as well as failures, defects, and other events that affect the facility's equipment, buildings, and structures
  - Recording and displaying information of every weld seam
- **Reducing complex repair costs and maintenance, and reducing personnel training**
  - Training by means of digital smart guides for assembly/ disassembly and operation of the equipment, using tools of virtual and augmented reality (VR/AR)
- **Enhancing the level of emergency preparedness and response**
  - Modeling emergency and non-routine situations and drill sequences of activities with the use of virtual reality analytical simulators and computerized training system

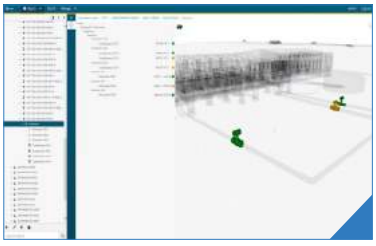
Effective Construction and Reconstruction

- **Assuring conformance to ICW (installation and construction works) standards**
  - Eliminating construction collisions by modeling proposed alternatives directly on-site using BIM
  - Accessing models remotely to support consultations with design experts
- **Reducing construction/reconstruction time and non-manufacturing costs**
  - Monitoring capital construction processes through synchronization with time-resource schedules
  - Modeling execution of CIW ahead/behind-of-schedule based on 4D building models
  - Supervising purchases and deliveries by means of 5D-6D models
- **Improving interaction among stakeholders**
  - Generating week/day orders automatically for construction site workers
  - Recording changes in digital logs for designer and engineering supervision; records are supplemented with any type of data (sketching, drawing, and so on), edited, and their statuses be revised
- **Improving construction operations and mitigation of the human factor on construction quality**
  - Modeling plans of complex construction operations and training personnel with the help of interactive 3D installation instructions

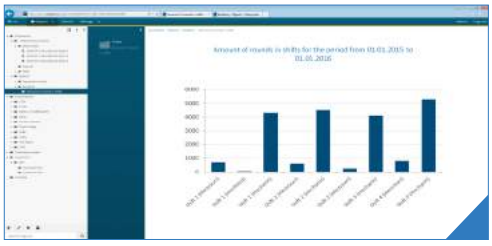
Impacts on Design

- **Improving quality of designs and documentation**
  - Eliminating spatial collisions on 3D models
  - Eliminating time conflicts on 4D models
  - Incorporating all design sections and integrating projects with management systems
- **Reducing design execution time**
  - Organizing sub-contractors activities efficiently
  - Maintaining design and engineering documentation submitted by sub-contractors, with the capability to change status of documentation, such as under-negotiation or approved

Monitoring construction



Visualizing gauge readings in NEOSYNTEZ



Reviewing repair statistics in NEOSYNTEZ

Learning More about NEOSYNTEZ

Feel free to consult with us about implementing NEOSYNTEZ for your specific needs. Our experts can address any issues that arise from the use of our software. We take into account the specifics of your enterprise.

Here is how you can learn about the abilities of our system.

Take part in a Webinar

- To learn more about NEOSYNTEZ, register for our free webinar that includes an on-line demonstration of the system's capabilities: **neolant.com/neosyntez/webinar**

Consult Us

- Consult with NEOLANT's experts by phone or e-mail to get answers to your questions about NEOSYNTEZ software: **+7 (499) 999 0000 ext. 192 / neosyntez@neolant.com**

Comprehensive Life Cycle Support

NEOLANT GC has long-term experience in creating and maintaining digital assets for our country's largest industrial facilities. We implement them in the shortest possible time with a minimal consumption of resources, and at best price for our customers.

The services of our company's experts include the following:

- Supporting information modeling for a full range of engineering services
- Providing information through CAD, BIM, GIS, and EDMS at all life cycle stages for industrial and civil construction facilities
- Introducing CAD, BIM, GIS, and EDMS to the everyday operation of customers

Depending on the life cycle stage, our services are available as follows:

At the operations state

- Creating and implementing IT systems based on BIM to support operations and MRO
- Creating digitized guidelines for installing, operating, and dismantling equipment
- Developing engineering and computing training systems and simulators based on virtual and augmented reality technologies (VR/AR)
- Creating and updating as-used BIM models

At the construction and reconstruction stages

- Computerizing processes for planning and monitoring construction and installation based on time/work schedules
- Minimizing planning errors from information gaps by integrating design, purchase, and construction activities
- Acting as general contractor and performing design supervision
- Solving everyday operations by generating as-built BIM models for the next stage of operations

At the design stage

- Developing turn-key projects, submitting 2D design documentation, and transferring as-designed BIM models to the next life cycle
- Creating as-designed BIM models for new facilities based on 2D design documentation developed by general contractors
- Analyzing spatial and technological conflicts for projects under development
- Preparing initial data for reconstruction of existing facilities by reengineering existing 2D documentation, laser scans, spherical panoramas, photographic surveys, and virtual and augmented reality

NEOLANT Group offers engineering and IT solutions for managing complex nuclear and power generation plants. Our solutions are based on the extensive IT experience and industry-specific knowledge acquired by the experienced NEOLANT team.

NEOLANT has software for information modeling, CAD, PLM, BIM, GIS, PDM, and PM. The experts at NEOLANT know how to integrate these systems into one other and into information systems used by customers.

NEOLANT provides the following services:

- **Developing industrial facility information and simulation models to support the facilities' lifecycles.**
- **Developing and implementing systems to manage engineering and plant operations data through integration with CAD, PLM, BIM, GIS, PDM, and PM.**
- **Researching and developing engineering design aimed at implementing plant-scale processes, systems, equipment, and capital construction projects.**

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NEOSYNTEZ Managing the Lifecycles of Complex Plants | SOMOX Construction Management Software | POLYNOM BIM for Complex Process Facilities | INTERBRIDGE Creating Unified BIM Derived from Various Formats