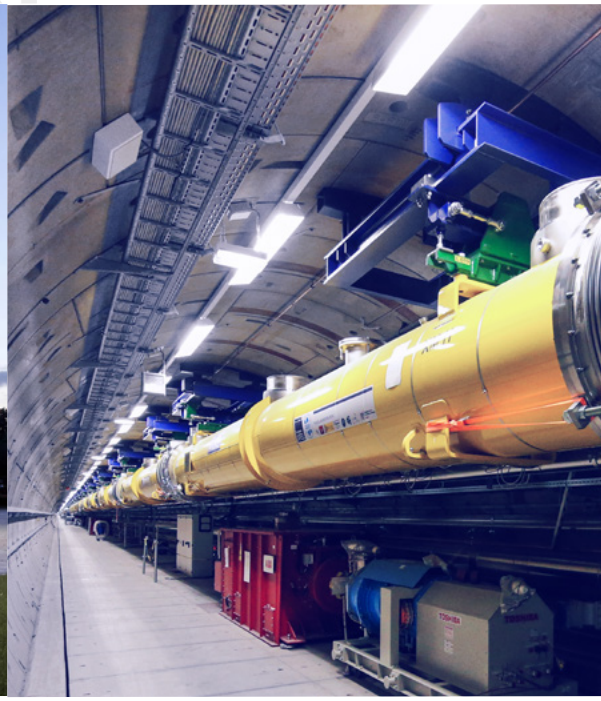
FNT

// simplify complexity

SUCCESS STORY



FNT Command at DESY - Germany's electron-synchrotron center

// Secure management of cable infrastructure for microworld research

Highly sensitive research facilities require extremely reliable IT infrastructures. Without them, a simple fault can create enormous time and cost pressures. DESY opted for FNT Command to achieve maximum transparency in its cable infrastructure for the multi-million-euro European XFEL project. Cable maintenance tasks in this underground facility are now centrally controlled, ensuring efficient operation of several hundred kilometers of cable.

Reliability and performance are perhaps the two most important requirements of the cable infrastructure in an advanced research facility, such as DESY. The facility also has an international reputation that needs to be protected. Every year, more than 3,000 researchers from over 40 nations use the particle accelerators at DESY. Hence the importance of management control over the several hundred kilometers of coaxial and fiber-optic cables that are used in the operation of these highly sensitive facilities.

"A professional system, such as FNT Command, gives us an almost complete overview of our entire cable infrastructure. This enables us to provide cross-departmental management of all accelerator operations and meet our objectives more effectively," explains Kay Wittenburg, head of the working group on signal tracing for the European XFEL particle accelerator. "This information is essential in order to achieve the high quality standard required."

However, DESY hasn't always had such a high degree of transparency. In fact, it once suffered major problems when a construction excavator accidentally severed an electrical line. That event highlighted a critical fact: that the loss of a single line could disrupt operation of the entire facility. At the time, staff had the lengthy and laborious task of identifying the affected services and systems as well as the managers who needed to be informed. Although some information had been documented in Excel, it was of limited value due to the lack of overview and version control. Although huge and costly, there was also an upside to this problem: it triggered the introduction of an IT-based cable management system.

Optimized network expansion and operation

The first major project featuring FNT Command was the construction of the European XFEL (see box). Most of this 3.4-km-long facility is housed in underground tunnels, where it produces intense pulses of laser-like X-rays for use in molecular-level research. The entire cable system, including signal paths and control cabinets, has been planned and documented centrally in FNT Command since construction began in 2009. Responsibility for operation and expansion of the facility is recorded individually for each system asset. The database in FNT Command provides what is essentially a complete overview of the cable infrastructure.

"Today, we can assign a member of staff to every documented cable, every electronics cabinet, and every component inside," says Kay Wittenburg. "This knowledge alone saves us an enormous amount of time during expansion planning and fault resolution."

More efficient use of maintenace windows

One of the special challenges at DESY is the way the cable infrastructure is maintained. Technicians can only access the European XFEL tunnel on designated maintenance days. This complicates the planning and execution of tasks, as staff can only gain an overview of the actual status while the facility is in operation. Hence the importance of the infrastructure database when planning modifications. "The technicians who go in have to know in detail what their task is, because they don't usually have much time," says Wittenburg. "The ability to document and plan in FNT Command lets us prepare detailed maintenance orders and coordinate in good time with the relevant departments, which means our technicians can work more efficiently."

Making technical infrastructures transparent

One of the initial challenges was to convince the various departments at DESY to migrate their current cable infrastructure inventories and related expansion plans to FNT Command.

"Since there was no pressure from the board for departments to adopt this documentation system, we used discussions and presentations to convince our colleagues of its benefits and gave them a say in the product selection process," recalls Wittenburg.

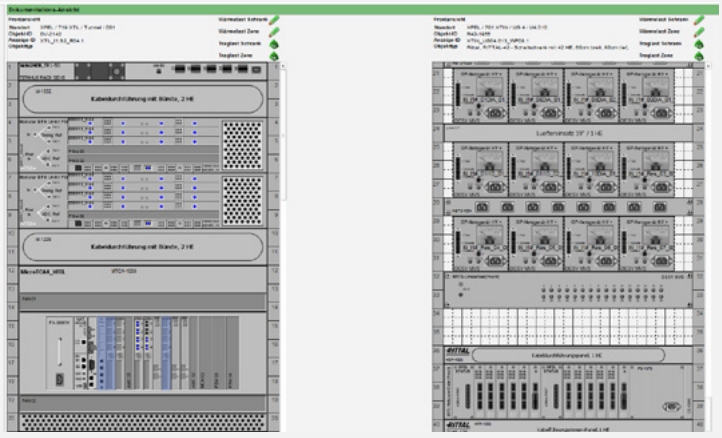
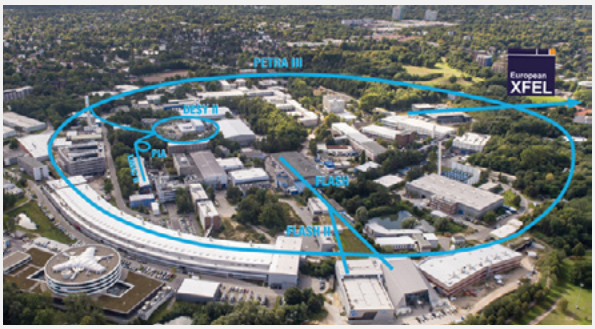


Fig. 1: FNT Command enables not only the exact documentaion and planning of Standard-Assets, but also of specific technical devices.

During this process, DESY compared 25 different solutions, of which only two met the organization's 120 benchmark criteria. "FNT Command had compelling advantages in the areas of workflow, change management, and system administration with multi-tenant capability," says Wittenburg. "Also, the integrated database, which enables easy expansion for additional application scenarios, was an important criterion in our decision."

The European XFEL facility

The European XFEL is a research facility built around an X-ray free-electron laser ("XFEL"). The facility is housed in 3.4-km-long tunnels extending from the DESY research center in Hamburg to the town of Schenefeld in Schleswig-Holstein. The XFEL generates short, intense pulses of laser-like X-rays with a wavelength that is variable between 0.05 and 5 nm. At 10 underground experiment stations, researchers can create molecular movies of chemical processes and 3D structural images of molecules, cells, and viruses. The European XFEL is jointly funded by 11 partner countries.



The internal persuasion effort got off to a good start, as each head of department immediately understood the value of a centralized system. There was, however, one major hurdle: the question of how to create the initial asset database. This was resolved by contracting an external provider to document the campus and its several hundred kilometers of cable.

Wittenburg has some tips for other organizations that require a similar documentation system: "Start by getting all the people who will ultimately use the system on board. The quickest way to get staff to buy in to this kind of system is to incorporate their ideas and suggestions." As for the initial documentation of infrastructure assets: "If you spare your own staff from having to do this work, they are less likely to have reservations about the system as a whole when the project starts."

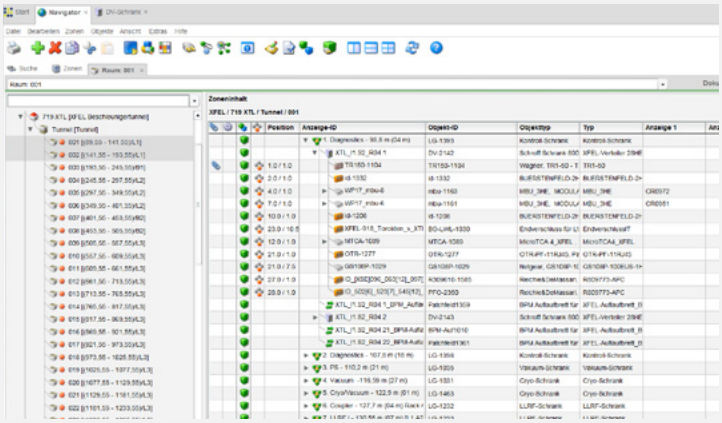


Fig. 2: Realistic recording of the technical infrastructure in individual tunnel sections to prepare the assignment precisely

From planning to actual state with auto-generated work orders

DESY used the planning functionality in FNT Command to stimulate staff to start documenting assets voluntarily. The key here was the fact that the existing cable infrastructure had already been documented: "If a system offers real day-to-day convenience, that will do more to win staff over than orders issued from above," notes Wittenburg

Staff now use the planning for new cable runs in FNT Command to automatically generate work orders for the relevant technicians. After installation, the actual-state documentation can be quickly updated or amended with just a few clicks. Using this procedure, it is easy to maintain the existing cable documentation and ensure it remains up to date.

Next step: Documenting the data center

During the introduction of FNT Command, the department responsible for the data center at DESY developed a major interest in the solution as an answer to its own asset management needs. DESY ranks highly in the world's largest computing grid for research institutions, which shares more than 25 petabytes of data each year. It provides secure communications between more than 200 data centers in 40 countries as well as some 10,000 computers at CERN, the European Organization for Nuclear Research.

Given the enormous computing resources required to participate in this grid, the data center needed a software-based management system. With its extensive DCIM (data center infrastructure management) functionality and the operational efficiency it provides, FNT Command was the obvious choice. In addition to its visualization options, threshold value calculations, and utilization analyses, FNT Command offers seamless expandability as a crucial factor in achieving complete transparency across all infrastructure assets – from switch cabinets to individual cables. Planning is already underway for documentation of the data center using FNT Command.

"A professional system, such as FNT Command, gives us an almost complete overview of our entire cable infrastructure. This information is essential in order to achieve the high quality standard required. We also save an enormous amount of time during expansion planning and fault resolution."

Kay Wittenburg
Head of the working group on signal tracing at DESY

DESY - Germany's electron-synchrotron center

DESY (Deutsche Elektronen-Synchrotron) is one of the world's leading accelerator centers. Researchers use its large-scale facilities to explore the microcosm in all its variety – from the interactions of tiny elementary particles and the behavior of new types of nanomaterials to biomolecular processes that are essential to life. The accelerators and instruments that DESY develops and builds provide unique research capabilities. They generate the world's most intense X-ray light, accelerate particles to record energies, and open entirely new windows on the universe. DESY employs around 2,400 staff at two locations, Hamburg and Zeuthen (near Berlin). Each year, more than 3,000 guest researchers from over 40 countries come to DESY to use its facilities.

For additional information: www.desy.de

FNT Software

Headquartered in Ellwangen, Germany, FNT is a leading provider of integrated software products for documenting and managing IT and telecommunications solutions, data centers, and buildings. The innovative FNT Command software suite has been deployed worldwide since 1994 as an OSS/IT management solution for telecommunications service providers, enterprises, and governmental organizations, with the number of users exceeding 25,000.

FNT's client base comprises more than 500 customers worldwide, including a wide range of well-known organizations in various sectors, e.g., the automotive industry, banking, insurance, chemicals, energy management, airports, hospitals, the media, manufacturing, telecommunications, IT service providers, and public institutions. More than half of Germany's DAX30 listed companies are FNT customers. FNT operates internationally and has subsidiaries in the United States (Parsippany, New Jersey), Singapore, Dubai (UAE), and Russia (Moscow). FNT works in close partnership with market-leading IT service providers and system integrators in many countries to distribute its software.

For additional information: www.fntsoftware.com