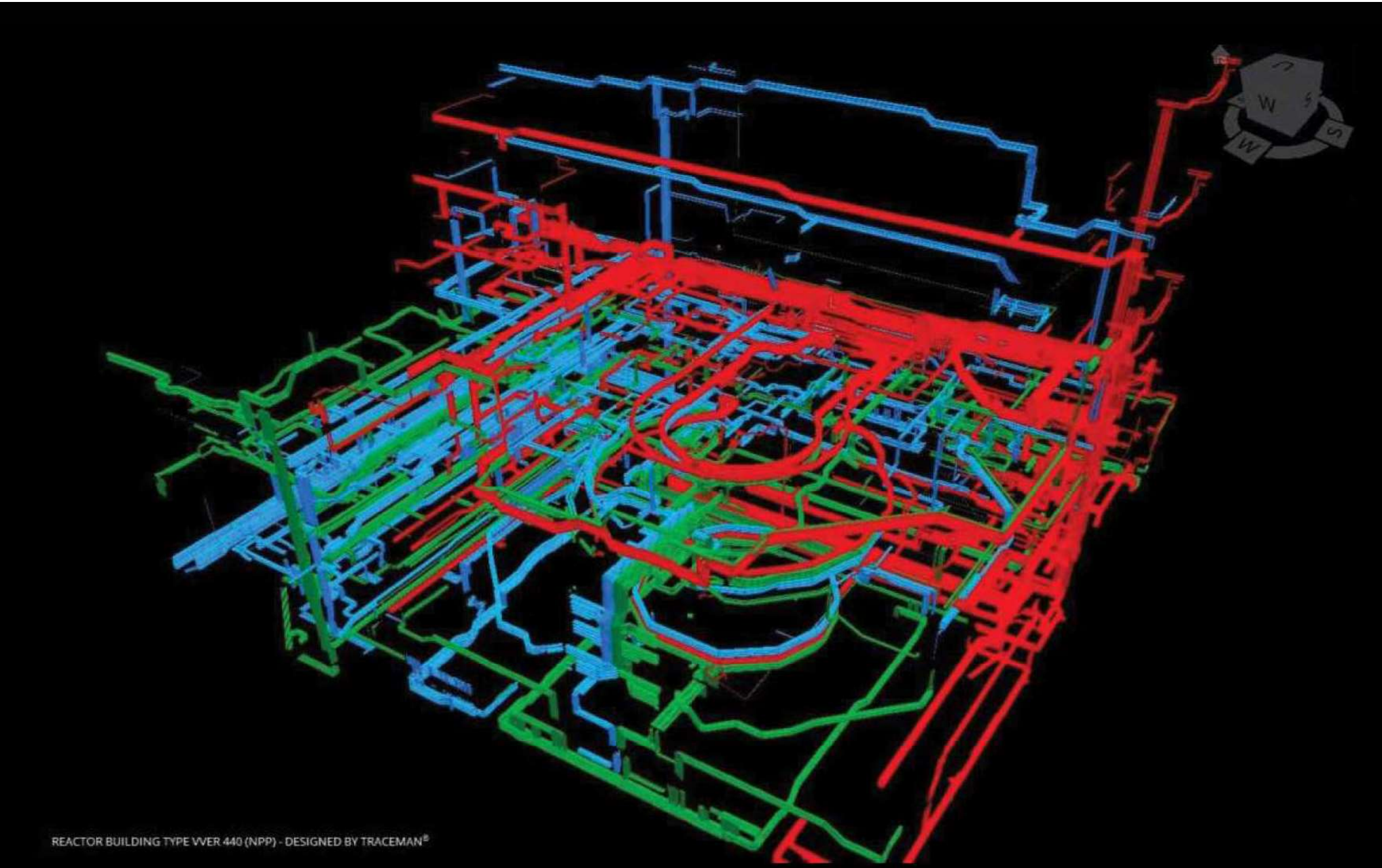
TRACEMAN®

CABLE ROUTING AND MANAGEMENT

CLEVER SOLUTION FOR DESIGN OF CABLE SYSTEMS

25 years of experience in power industry

KP BRNO®



REACTOR BUILDING TYPE VVER 440 (NPP) - DESIGNED BY TRACEMAN®

CONTENT

1. THE COMPANY

BASIC INFORMATION

- KIP BRNO IS A CZECH COMPANY
- ESTABLISHED IN 1992
- DOMICILE - BRNO, CZECH REPUBLIC
- BRANCH OFFICE IN BRATISLAVA, SLOVAKIA
- ISO 9001:2015 QUALITY MANAGEMENT SYSTEM CERTIFICATE
- MEMBER OF CPIA (CZECH POWER INDUSTRY ALLIANCE)

MAIN ACTIVITIES

- DESIGN OF CABLE SYSTEMS (CABLE ROUTING AND MANAGEMENT - TRACEMAN)
- DESIGN OF ELECTRICAL INSTALLATION - HIGH VOLTAGE, LOW VOLTAGE AND I&C
- INDUSTRIAL AUTOMATION (CONTROL OF TECHNOLOGICAL PROCESSES AND MACHINES)
- DEVELOPMENT OF CONTROL SOFTWARE FOR INDUSTRIAL AUTOMATION
- PRODUCTION OHF SWITCHDOARDS, CONTROL PANELS AND CABINETS
- SUPPLY OF TECHNOLOGICAL SYSTEMS BY USER REQUIREMENTS
- ELECTRICAL INSTALLATION - HIGH VOLTAGE, LOW VOLTAGE
- INTELLIGNET BUILDING CONTROL - SMART HOME LOXONE, TECO (FOXTROT) - (INTELLIGENT ELECTRICAL INSTALLATION)

MERITS

- QUALITY
- RELIABILITY
- TRUSTWORTHINESS
- SATISFIED CUSTOMER

REFERENCES

- **NUCLEAR POWER PLANT MOCHOVCE (VVER 440)** - TRACEMAN, COMPLEX CABLE COORDINATION, CABLE ROUTING AND SUPERVISION
  SCOPE: 12.500 CABLE RACEWAYS, 100.000 CABLES, 50.000 PIECES OF EQUIPMENT
  DESTINATION: SLOVAKIA
  PERIOD: 2009 – SO FAR

- **NUCLEAR POWER PLANT TEMELÍN (VVER 1000)** - TRACEMAN, CABLE ROUTING AND SUPERVISION
  SCOPE: 15.000 CABLE RACEWAYS, 120.000 CABLES, 60.000 PIECES OF EQUIPMENT
  DESTINATION: CZECHIA
  PERIOD: 1997 - 2012)

- **POWER PLANT TUŠIMICE (4 x 250MW)** - TRACEMAN, INŽENÝRSKÁ PODPORA REALIZACE NOSNÉHO KABELOVÉHO SYSTÉMU A POKLÁDKY KABELÁŽE
  SCOPE: 12.000 CABLES, 6.000 PIECES OF EQUIPMENT
  DESTINATION: CZECHIA
  PERIOD: 2008 – 2012

2. DESIGN OF CABLE SYSTENS

DESCRIPTION

The cable system, sometimes also referred to as cable management, is a significant technological complex in large-scale industrial plants such as power plants (nuclear, conventional), electrical substations, chemical or metallurgical plants, and a critical part in terms of functionality and reliability.

The cable system consists of the cables themselves interconnecting the individual devices which energy and signal enabling their operation, as well as full, safe, functional control and cable supporting systems designed for cable storage. Other parts of cable system are hermetic and non hermetic cable penetrations, secondary cable raceways, cable drum management a etc.

The cable system is subject of very strict segregation and separation requirements, which are necessary to ensure safety and electrical compatibility, the so-called EMC concept, especially in nuclear power plants.

The scope and importance of a cable system requires a system approach. TRACEMAN has been developed to meet all the requirements apply to a cable system during the design of the cable system and for the management and maintenance during the plant lifetime.

3. TRACEMAN®

DESCRIPTION

We have our own solution software application TRACEMAN® tested at both Czech nuclear power plants Temelín and Dukovany as well as abroad.

TRACEMAN development began in 1999. The system acquired its own logo and trademark In 2005. Continuous development today provides a highly professional and specialized tool for system design of cabling and cable supporting systems in 2D and 3D environments.

TRACEMAN®

CABLE ROUTING AND MANAGEMENT

TRACEMAN® is a systematic approach to creating cable systems projects with the most stringent conditions applied in the most demanding operations such as nuclear power plants.

We are ready to create a turnkey cable system project, including the subsequent comprehensive coordination of the cable system on site.

TRACEMAN is intended for:

- design of cable supporting systems
- cable routing to cable trays
- complex cable coordination during erection
- cable management during whole plant lifetime

Design of cable supporting systems

- design of cables (specifying From, To, estimated length, dimension, voltage level, separation, segregation, redundancy, quality, seismicity, selectivity)
- creation of catalogue components for cable supporting constructions in 3D (support types, straight pieces, horizontal and vertical bending, t-pieces, crossings, turn off pieces)
- design of cable supporting constructions in 3D (cable ladders, trays a supports)
- cable routing in 3D (specifying real length of cable and its routing keeping all needed routing criteria)
- design of non hermetic penetration (specifying the number of holes, diameter of holes, cables in holes, sealing material and its consumption, penetration layouts)
- design of hermetic penetration (specifying the number of holes, diameter of holes, cables in holes, types (modules) of penetrations setting of requirements for severe accident conditions, penetration layouts, wiring diagrams of penetrations)
- engineering solutions - exceptions from design

Complex cable coordination during erection

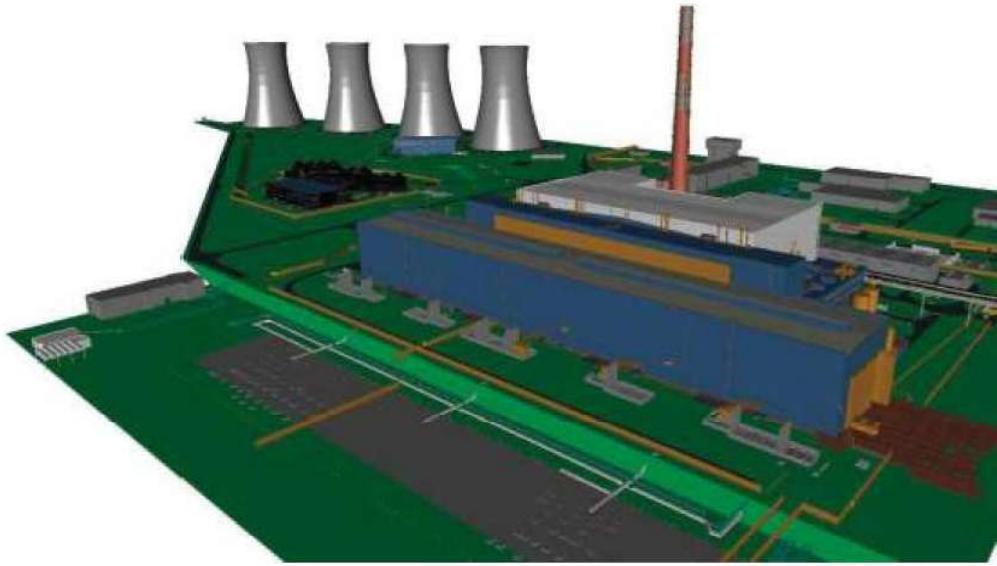
- technical support of design
- cable supervision of cable trays and support erection and cable pulling
- creation of engineering solutions and their implementation to TRACEMAN
- cable revisions

Cable management

- technical support of design, raceways construction and cable pulling
- actual overview of design and erection progress
- cable coordination during whole plant lifetime
- cable drum management

WHY USE TRACEMAN®

- Clear user interface
- Intuitive and comfortable control
- Full visualization of all cable system elements with their possible modifications
- Creation of a comprehensive design (cable supporting system, cables)
- Systematic cable management during the life span
- Ensures organized and systematic work during implementation
- Providing comprehensive information about the cable system (bill of material, cables, hermetic penetrations, non-hermetic penetrations)
- The ability to exchange data with other applications
- Large number of database and print output according to the realization needs
- Multi-user system, application CLIENT - SERVER
- ORACLE database system
- System variability according to its deployment
- Stable and proven system
- Multi-lingual system version (CZE, ENG, RUS, SVK)
- regular system revisions overview
- Fully integrated help



INPUT - OUTPUT

TRACEMAN® is an open application and its data are in a format enabling exchange them with many other software applications in database, graphic and text form.

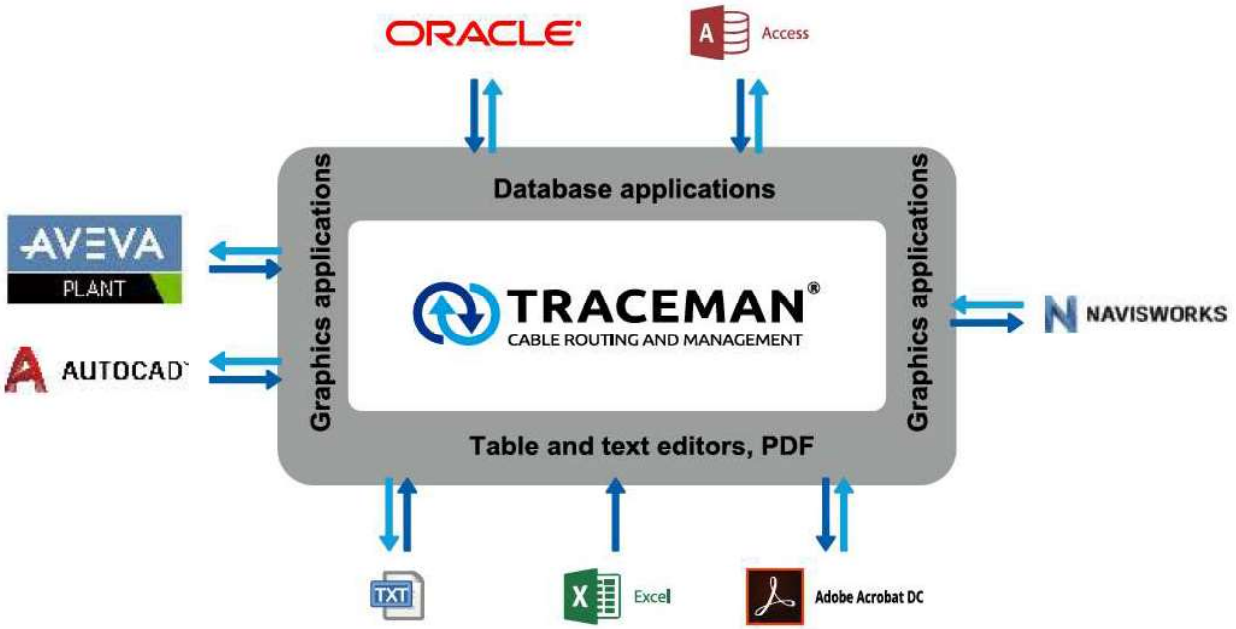
- Data can be shared with other software applications
- Data can be exported and imported
- Data are in 3D format

INPUT

- databases and lists
- 2D drawings
- 3D extracts

OUTPUT

- bill of material (types and cable lengths, raceways, penetrations, sealing ...)
- construction drawings (raceways, penetrations, cross sections, wiring drawings ...)
- cable pulling cards
- database (cables - lengths, parameters, pieces of equipment, penetrations)



USERS INTERFACE

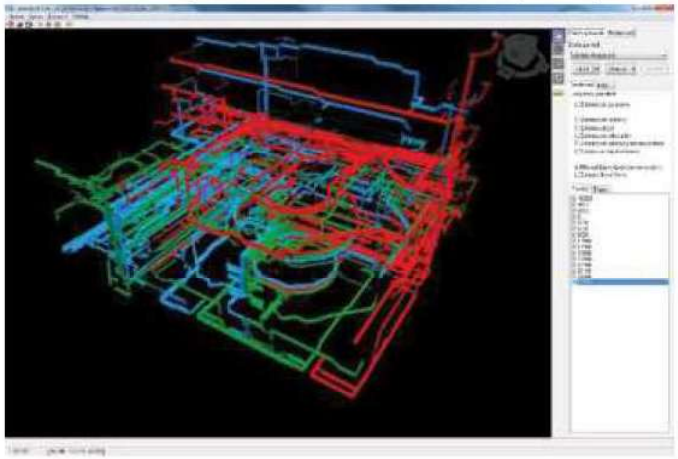
high standard of visualisation in 2D and 3D **TRACEMAN**®

- Examples of visualisation

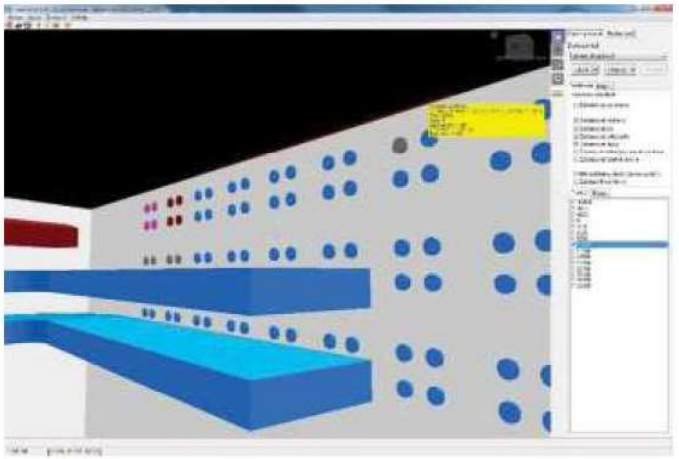
2D plant (general layout)

2D floor of civil structure

cable trays in reactor hall (divided by EEPS)



detail of tray and non hermetic penetration

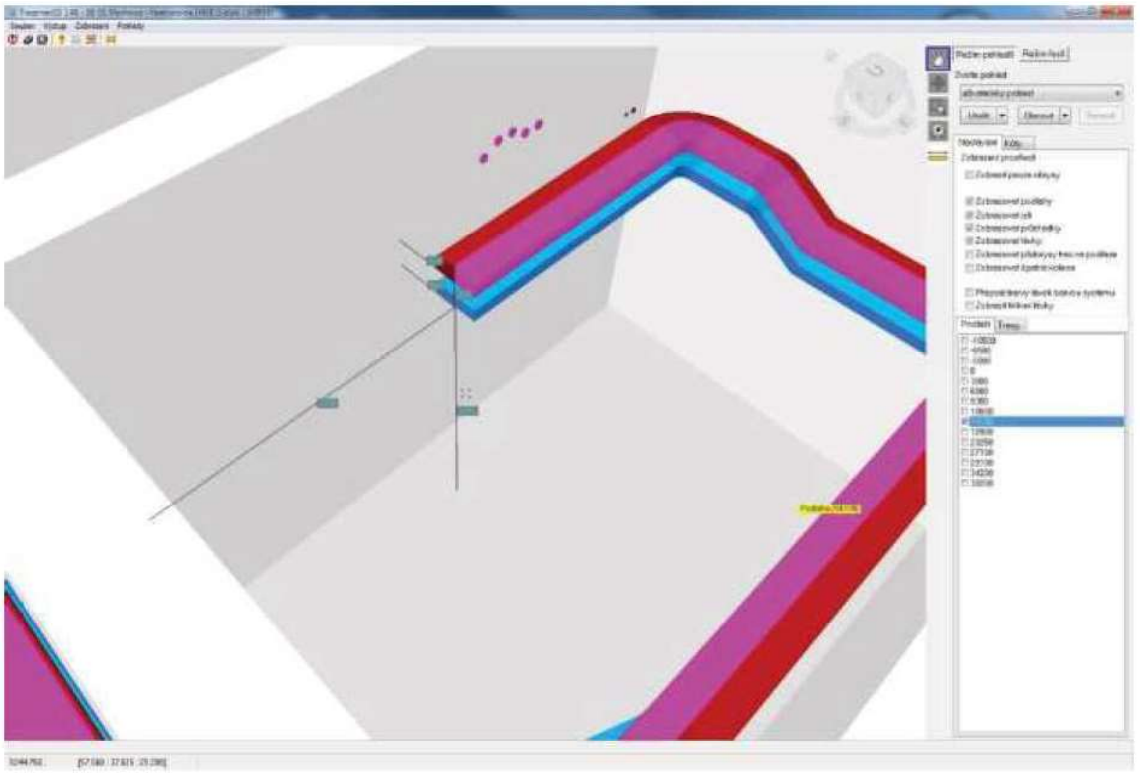


LEGISLATIVE

- observation of technical standards and specifications by cabling management and cable routing
- application of specifications for each locality
- application of engineering solutions
- regular verification

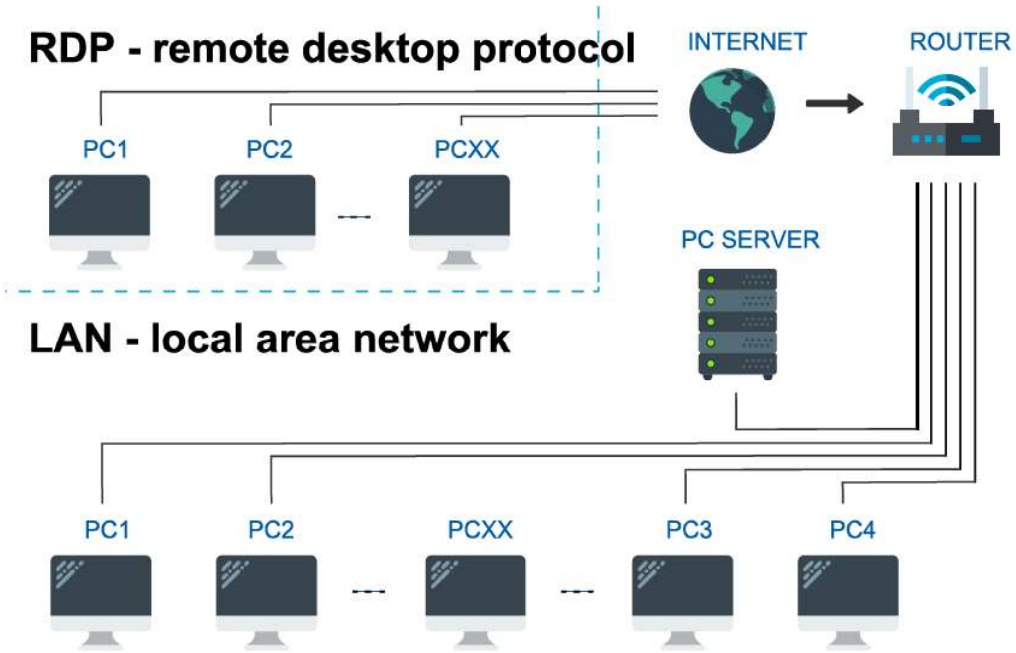
CHECKS

- data consistency
- loading
- filling
- separation
- segregation
- redundancy
- seismicity
- environment conditions
- collisions between cabling and civil and technology



CLIENT – SERVER APLLICATION

- data access in network enabling concurrent work by multiple users
- working and viewing over the internet through
- online data access
- possibility of an offline application in notebook



SYSTEM AND DATA SECURITY

- hardware means
- software means
- data backup system

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