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Introduction

In over **65 years** of existence Dalekovod has grown into a company whose quality is recognized in more than **80 countries** worldwide.

Dalekovod d.d. is a modern organization that provides engineering, manufacturing, and construction services. The company has specialized in carrying out contract works based on turn-key solutions in the following areas:

- Electrical power facilities, especially the 0.4 to 1000kV transmission line
- Sub-stations of all types and voltage levels up to 500kV
- Air, underground and marine cables rated up to 110kV
- Telecommunication facilities
- All types of networks and antennas
- Production of suspension and jointing equipment for all types of transmission lines and substations between 0.4 and 1000kV
- Development and construction of all metal parts for roadways, especially for: road lighting, protective fencing and traffic signalization
- Tunnel lighting and traffic management
- Electrification of railway and tramway lines in cities.

Dalekovod d.d. has many years of experience in testing and quality control of its products, always taking consideration of environmental protection and other ecological requirements. The special attention is given to work safety practices, fire and chemical protection and protection from work hazards.

In over 65 years of existence Dalekovod has grown into a large company whose quality is recognized in more than 80 countries worldwide. The company’s management is aware that one of their key strengths is the knowledge and expertise of the employees, thus DALEKOVOD is constantly investing in their education and training. In addition, the protection of workers’ health, especially on demanding projects, is one of the main priorities of the company. As a socially responsible company, DALEKOVOD pays special attention to the protection of the environment through an established and applicable environmental management system and operates in accordance with the principles of sustainable development.
CONNECTING WORLDS, BUILDING THE FUTURE.
OUR VISION is to become a leading international company in the provision of comprehensive and high-quality services in the field of engineering, manufacturing and construction of electric power, road, rail and telecommunications infrastructure especially by strengthening our position in foreign markets, contracting new business and penetrating into new markets, on the basis of our long-standing tradition, knowledge, competitiveness, innovation and reliability.

OUR MISSION is to develop and maintain business relationships with domestic and foreign partners, ensuring high quality standards in the field of engineering, manufacturing and construction of electric power, road, rail and telecommunications infrastructure based on years of knowledge and tradition, innovation and strong social responsibility and confidence in the successful the implementation of all activities.
History

Dalekovod has a 65-year tradition

Our journey to success and recognition began in 1949 when DALEKOVD was founded as “public business enterprise of national importance for the construction and installation of transmission lines, switching stations and substations in the territory of the People’s Republic of Croatia”. Although officially DALEKOVD could start operating only upon the Decision of the Government of the Federal People’s Republic of Yugoslavia of 8 April 1949, but the document “Službovnica” provides the fact that this happened on 1 April, and perhaps even earlier, considering that electricity was very much needed in the war-ravaged country. The existing distribution network and plants needed renovation, and the construction of 110 kV transmission line Vinodol – Rakitje and Vinodol – Matulji needed to be finished, as well as a number of other 35 and 10 kV transmission lines and low-voltage networks. While today we can use helicopters in setting up transmission lines, back then parts of lines were often transported by horses and donkeys, and erected with human hands.

In 1950 began the intensive preparations for the construction of 110 kV transmission facilities, which was a stepping-stone to the development of DALEKOVD as a modern company for the design, manufacture and construction of electrical power facilities. End of the 50s was marked by the first cross-border transmission line and the beginning of the development of the telecommunications network, while the early 60’s were a period of intensive overseas operations - Togo, Cambodia, Pakistan, Guinea...The seventies brought the commissioning of the 400 kV line, an extremely demanding program in the history of electric power industry in this region, called the ring “Nikola Tesla”. DALEKOVD proved its knowledge and competence in exceptional circumstances. One such emergency situation was in 1980 when freezing rain hit Velebit, Kapela and parts of the Slovenian coast, and deposits of ice toppled or damaged more than 90 transmission towers on the route of the 400 kV line Konjsko - Melina. An important power transmission connection, 400 kV Melina (Vrbovsko) - Tumbri, was built in 1991, at the time of the utmost importance for the functioning of separate electrical power system. During the Croatian War of Independence, ignoring the danger of mines or proximity to the battlefield, the employees of DALEKOVD were fearlessly building or repairing destroyed infrastructure. At the end of the nineties and the turn of the century, DALEKOVD has built in Croatia a large number of major power facilities obtained after participating in the public bidding process. In the post-war period, until 2008, DALEKOVD was engaged in the reconstruction of transmission lines and substations all over Croatia. The period after the war records the intensification of business activities overseas and especially a strong presence of DALEKOVD in Norway, operations in Greenland and Iceland, the construction of 400 kV transmission line Tirana - Podgorica in Albania and Montenegro, and a real venture in Kazakhstan - design, construction and commissioning of the 500 kV transmission line Agadyr - YukGres (390 km).
65 years of tradition

More than 12,000 km of transmission lines up to 750 kV
Dalekovod finds that competence and reliability of employees are the greatest guarantor of quality, and thus it constantly invests in human resources and promotes the professional potential of its employees, while minimizing the risk of safety, environmental and other incidents.

**Our advantages but also constant challenges are**

- Demanding projects
- Continuing education
- Special attention to HSE aspects
Dalekovod Group

Companies in Croatia

Dalekovod
Construction of transmission lines and substations, equipment of tunnels, roads and highways, construction of metal structures (halls and indoor facilities)

Dalekovod Proizvodnja
Production of metal structures for overhead transmission towers, suspension and jointing equipment, and steel fences

Dalekovod Projekt
Design of energy and infrastructure facilities

Galvanizing plant
Galvanization of metal equipment

UNIDAL
Co-owner of the plant
Production of forgings
President of the Management Board

- Alen Premužak

Management Board

- Helena Jurčić Šestan
- Marko Jurković
- Ivica Kranjčić
- Ivan Kurobasa

Supervisory Board

- Marko Lesić
- Ivan Peteržilnik
- Vlado Ćović
- Krešimir Ružđak
- Hrvoje Markovinović
- Mirela Tomljanović Radović
- Anton Pernar
- Marko Makek
- Uwe Heiland
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<td>Suspension and jointing equipment up to 750 kV, steel structures, lattice and polygonal towers</td>
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<td>Construction of the power supply and contact line system for railway infrastructure</td>
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The story on designing started more than 65 years ago, when in a year 1949 a relatively modest team of experts in the newly established company DALEKOVOD began building electrical power facilities.
THE PROPER PREPARATION OF PROJECT DOCUMENTATION WAS THE FIRST CHALLENGE PLACED BEFORE THE YOUNG COMPANY, WHICH WAS SUPPOSED TO TAKE OVER THE DEMANDING PROJECTS OF CONSTRUCTION AND DESIGN IN THE POST-WAR PERIOD.

By expanding the potential of the company, the scope of the activities included designing substations and switchyards, underground cables, contact lines, cableways, antenna masts and other electrical power and telecommunication facilities. Dalekovod Projekt d.o.o. currently has around eighty employees. Most of them are authorized architects and engineers of various professions, primarily electrical and civil engineers, but also surveyors, geologists and traffic engineers. Thanks to its references and experience, Dalekovod Projekt d.o.o. today has highly professional project teams, specialized for all services related to its activities.

The history of the company includes numerous projects of various complexity and size - from transmission lines and substations to telecommunications antenna masts, production halls, sports arenas, schools, buildings, municipal infrastructure, solar power plants - that demonstrate the company’s expertise in the design, supervision, consulting and engineering.

**General information**

- High quality and experienced professionals, and the world’s top computer software and geodetic instruments;
- Domestic and foreign experience in designing (Great Britain, Poland, France, Slovenia, Albania, Kosovo, Macedonia, Bosnia and Herzegovina, Montenegro...).
Metal structures

$\geq 15,000$ t/year
Production


General information
- Presence in the domestic and international market in more than 40 countries (Europe, Middle East, Egypt, Nigeria, Chile, Pakistan)
- Suspension and joint equipment plant (up to 750 kV)
- Metal construction plant (overhead transmission towers, metal structures and parts of structures, lighting poles, antenna masts and signal poles)
- Galvanizing plant

Key figures
- Suspension and jointing equipment: > 3,500 t/year
- Metal structures (overhead transmission towers and other masts): > 15,000 t/year
- Galvanizing plant: 32,000 t/year

Products
- suspension and jointing equipment for transmission lines of all nominal voltage levels
- aerial bundled cable accessories
- contact line accessories
- metal structures and parts of structures
- overhead transmission towers
- lighting and signal poles and antenna masts
- substation and switchgear structures
- halls
- steel roof structures
- guard rail systems for motorways
- barriers for protection against noise
- traffic signalization and signpost gantries
- aerial bundled cable accessories
- optical ground wire accessories
- tower substations
- special purpose tools and machines.

Services
- anticorrosive protection of steel structures by hot-dip galvanizing and painting
- forging and pressing of steel forgings
- casting (ingot)
- forging and pressing of non-ferrous metals

UNIDAL was a blacksmith shop founded at the beginning of the last century and today it represents a modern organizational structure with core business in the production of heat treated forgings for all types of transmission lines up to 500kV, electrification of railway lines, automotive industry and other types for various purposes.

Five forge generator units produce around 250 tonnes of forgings per month, with masses from 0.1 to 2kg (exceptionally up to 5 kg depending on the shape and dimensions of forgings). The production takes place on the free-falling and air hammers of 1500 to 3900 kpm and friction presses and horizontal forging machines.

The production of forgings is carried out in accordance with the requirements of ISO 9001:2000 international standard.

The ISO TS 16949 standard for the automotive industry is established.
Construction

**General information**
- Broad knowledge and experience in supervision, construction and commissioning of transmission lines in various climatic conditions and difficult terrain
- Significant references and experience in the construction of substations and road and railway infrastructure
- Rich international experience in Scandinavia, Iceland, Greenland, Western and Eastern Europe, Ukraine and Kazakhstan

**Key figures**
- Over 12,000 km of transmission lines up to 750 kV
- Total length of OPGW – 4,000 km
- 700 GSM base stations
- 500 km of projects for road and motorway infrastructure
- 22 tunnels (total of 80 km, including the longest tunnel in Croatia, Mala Kapela l = 5,760 m).

**PC Engineering of the company Dalekovod d.d. includes the following tasks:**
- Project management
- Market research
- Analysis and strategy of bidding for particular markets
- Preparation of bids for domestic and foreign markets
- Sale and logistics (supply of strategic materials and equipment, market research, foreign trade activities)
- Operational preparations
- Project procurement
- Construction of high voltage transmission lines
- Construction of the distribution network,
- Infrastructure facilities and industrial buildings
- Construction of substations
- Electrical measurements and testing
- Surveying services
- Transport
- Property maintenance
- Maintenance of tools, equipment, machinery and vehicles
- Storage.

PC Engineering is focused on the processing of certain programs and segments of the markets (regions), bidding, contracting, management and implementation of projects, in order to achieve business success in each market.
>12,000 km of transmission lines up to 750 kV
SIGNIFICANT REFERENCES

Transmission lines

In Croatia DALEKOVOD has designed and installed on the new transmission lines and replaced on the existing ones the earth wire with the new OPGW on approximately 3,000 km.

Connecting Croatia and abroad

- TL 400 kV Skareheia (Evje)-Holen (Norway)
- TL 420 kV NEA- Riksgrensen (Swedish border)
- TL 420 kV Sultartangalina 3 (Iceland)
- TL 420 kV Brennimelsina 1 (Iceland)
- TL 420 kV Fljotsdalslina 3&4 (Iceland)
- TL 400 kV Tirana–Podgorica (Albania-Montenegro)
- DC 500 kV Dannebo-Finbølø (Sweden)
- TL 400 kV Bitola-Greek border (Macedonia-Greece)
- TL 66 kV HE Ilulissat-TS Ilulissat (Greenland)
- TL 500 kV Agadyr-YukGres (Kazakhstan)
- TL 2x400 kV Ernestinovo-Pecs, section: Ernestinovo-State Border
- TL 400 kV Tirana – Podgorica
- TL 2x220 kV Plomin-Vodnjan
- TL 220 kV Zakučac-Mostar
- TL 420 kV Sima – Samnanger (Norway)
- TL 300 (420) kV Sauda - Liastolen
- Installation of OPGW and additional works to strengthen the construction of transmission lines, the design, measurements, construction of access roads, procurement of associated jointing equipment and cables
- TL 2x400 kV Beričevo – Krško
- Renovation of TL 400,220 and 110 kV from the Ernestinovo program
- Renovation of TL 2x110 kV Pračno-Kostajnica
- TL 2x110 kV for SS Tupljak
- Reconstruction of TL 110 kV Bilice-Knin (introduction in SS Drniš)

*OPGW-optical ground wire (shield wire with optical fibres)
TL 420 kV Sima – Samnanger

The location in the southern part of Norway with a maximum altitude of 600 meters and one of the most challenging projects placed before Dalekovod due to the configuration of the terrain.

The project involved the construction of new towers, but due to bad weather conditions (fog, rain, wind...) the works could be performed only during a certain period in the summer months. The only possible transport to this high location was the helicopter, thus for the first time the camp was built at an altitude of over 1000m with complete infrastructure; water, drainage, electricity, heating and daily food delivery. Along with superior logistics, the investor promised a premium if works are completed a month earlier than the agreed deadline, which was achieved, four days before the expiry of the term. At the opening of the transmission line Sima – Smnanger, the investor Statnett declared the project ‘the most successful project in history’.

Projects in the fjords

Dalekovod is the first foreign company that has managed to meet specific requirements in Norway. Crossing the fjords always brings a number of challenges. The forces of nature in this climate are extremely powerful, and the project requirements include the use of special machines, building more massive constructions, which means more working hours. The first fjord was 2.8 kilometres wide and, in the absence of adequate tools and machinery, Dalekovod had to improvise a lot, but quickly adjustments were made and each project broke new records.

Already at the next fjord, the project was completed in 28 calendar or 22 business days, and the project after that, which was in many ways the most demanding with regard to the configuration of the terrain and strong currents, required descending into the sea and 7 ships regulating the traffic and transporting material. Dalekovod tends to use the cutting-edge technology in order to perform even the most demanding tasks.
SIGNIFICANT REFERENCES

Substations

DALEKOVOD HAS PARTICIPATED IN CONSTRUCTION AND RECONSTRUCTION OF A LARGE NUMBER OF SUBSTATIONS (400, 220, 110 AND 32 kV).

- Construction of SS 110/35/10(20) kV Kupres
- SS 110/30 kV Nedeljanec
- Construction of a new SS 35/20 kV Vrbovsko
- Reconstruction of SS 400/110 kV Ernestinovo
- Construction of operational and storage buildings and reconstruction of the management centre building in SS 400/220/110 kV Žerjavinc
- Construction of a new SS 110/20 kV Krapina Bobovje
- Reconstruction and expansion of SS 110/35 kV Pokupje, SS 110/10(20)/10 kV Dubovac and modification of the transmission line, from 35 kV to 110 kV between SS 110/35 kV Pokupje and SS 110/10(20)/10 kV Dubovac
- Construction of a new SS 110/20 kV Buzet with a connecting 2x110 kV transmission line
- Supply and installation of electric transport and other equipment for the motorway, tunnels, 110 kV cables and noise protection (SS Suštak- SS Turnič – SS Zamet- SS Pehlin)
- Reconstruction of SS 400/110 kV Bitola 2 with the delivery of equipment and installation of a new control system and replacement of the existing 400 kV and 110 kV protection system
- Construction of a new SS 220/110/35 kV Plat with connecting transmission lines
- Expansion of a SS 400/110 kV Ribarevina, construction of a new SS 110/20 kV Podgorica 5 and new 110 kV transmission line between SS 110/20 kV Podgorica 3 and SS 110/20 kV Podgorica 5
- Construction of a new SS 110/20 kV Vrgorac with 110 kV transmission line connection
- Construction of a new SS 110/20 kV Srđ
- Construction of a cable connection 110 kV SS Pehlin – SS Turnič
The first project of replacing the entire system of protection and management, while all other bays smoothly perform the intended functions. Bitola, the most important substation in Macedonia, is directly linked to the biggest and most essential production unit in the country represented by the Rek thermal power plant. It consists of 13 110-kV bays and 8 400-kV bays, of which one is an international line towards Greece. Replacement of the entire old system of management and protection, following a period of deterioration, large fire and poor repair, and without any existing documentation, was a big challenge for Dalekovod. Time limits and predetermined deadlines, when exactly certain parts will be strategically turned off and be subjected to achieving the targeted project, contributed to the complexity of the task organization. Dalekovod has performed the job professionally and on time.

The task of Dalekovod in a consortium with Siemens was to provide as-built design documents, deliver all the equipment and to put the system into operation. The project in Montenegro started with the construction of a transformer bay at the substation Ribarevina (400kV) and the expansion of buses. As in the case of Bitola 2, the whole process of achieving the project objectives had to be done while other bays at the substation work unhindered. In terms of construction, the project was very demanding, since it included the construction of a transformer bay, installation of a new transformer, numerous excavations, concrete works, lifting and lowering the portal while adjacent bays are at full power. The next step was the construction of a new substation Podgorica 5 close to the center of Podgorica, and the project is finalized by the construction of a cable through the city that required a seamless organization and implementation. It is in this and similar projects that concern about safety at work should be raised to the maximum, and readiness for timely interventions must never be called into question.
In recent years DALEKOVOD has participated in the construction and equipping of highways, and has positioned itself in the field of energy, telecommunications and equipment as a responsible and reliable partner that operates according to accepted and adopted European standards.
RELEVANT REFERENCES / Power and Infrastructural Projects

Highways and tunnels

- Kikovica – Stara Sušica section, construction phase II B – power, traffic and other equipment and COKP reconstruction
- Rijeka City Bypass, Orešovica – Diračje section

**D8 Sveti Kuzam – Križišće (2009-2014)**
- Transfer, relocation and protection of installations
- Road equipment and installations
- Group A – Traffic signaling and equipment
- Group B – Tunnel power supply, lighting, ventilation and equipment
- Group D – Telecommunications, tunnel fire alarms and remote management and control system

**D31 Velika Gorica Bypass (2007-2010)**
- Equipment and transfer of installations

- Transfer and protection of installations
- Traffic equipment and signaling
- Works and equipment for PIS, SDUN and COKP
- Tunnel equipment

**Zagreb – Karlovac – Sveti Rok – Split – Ploče Motorway (over 50 contracts for various sections)**
- Equipment of tunnel tubes in Mala Kapela and Sveti Rok tunnels having a total length of almost 12 km
- Relocation and protection of installations
- Power supply and equipment of sections
- Lighting, telecommunications, traffic barriers and chain-link fencing
- COKP equipment
- Provision of bora wind protective barriers

**Zagreb – Macelj Motorway (2007-2008)**
- Power supply – high and medium voltage
- Equipment

- Power supply – high and medium voltage
- Equipment

**Corridor Vc**
- Equipment, power supply and lighting for the Osijek – Đakovo – Sredanci section

DALEKOVOĐ has provided equipment for 49 tunnels in Croatia with a total length of 80,473 m.

According to the report of the organization EUROTAP (European Tunnel Assessment Programme) on the inspection and evaluation of tunnels in the EU countries, in terms of the risks and safety of tunnel equipment, tunnels Javorova kosa, Plasina, Grič, Mala Kapela and Brinje were best rated in competition with 152 tunnels from 18 European countries in the period from 2005 to 2007.

In 2003 DALEKOVOĐ was responsible for the equipping of the tunnels Sveti Rok (L=5661 M), and Mala Kapela (L=5760 m) in 2005, while 2009 saw the completion of the equipping of other tubes of the tunnels Sveti Rok (L=5661 m) and Mala Kapela (L=5760 m).

*MTCC - Maintenance and traffic control center
*FTS - Frontal toll station
DALEKOVOD TRIED HIS HAND IN THE CONSTRUCTION OF SPORTS ARENAS AND INDUSTRIAL HALLS AND PLANTS AND HAS PROVED TO BE A RELIABLE PARTNER IN THE REALIZATION OF THE MOST COMPLEX PROJECTS LIKE THE DOME STRUCTURE OF THE KREŠIMIR ČOSIĆ HALL IN THE FORM OF “PAG LACE”.

SIGNIFICANT REFERENCES

Halls and other facilities

This was a big challenge for DALEKOVOD, but it was mastered and completed successfully as well as other projects mentioned here.

- Krešimir Čosić Hall in Zadar - manufacturing and installation of roof structure
- Spaladium Arena in Split - manufacturing and installation of roof structure
- Reconstruction of the Institute IGH - Laboratory Zagreb - manufacturing and assembly of the suspension structure
- Institution of emergency medical care Zagreb – construction;
- TS Žerjavinec – reconstruction of MCU and construction of plant buildings;
- Dubrovnik Airport - reconstruction of the terminal building;
- INA Oil Refinery Sisak - FCC gasoline desulfurization plant.

*MCU Multipoint Control Unit, component of videoconferencing infrastructure that enables establishing multiple connections.
Dalekovod laboratory

Dalekovod laboratory performs various kinds of testing including visual, dimensional, mechanical, electrical, wear-and-tear tests of suspension and jointing equipment for transmission lines, substations and other electrical power facilities; chemical, magnetic and other tests of the quality and thickness of zinc plating; tests of mechanical properties and hardness of metal materials; testing of tension cranes, compressive strength of concrete, noise and lighting levels, hardness of rubber, nuts and bolts, chemical composition of ferrous and non-ferrous materials, control and filling up fire extinguishers, as well as testing and inspection of the working environment, machinery and equipment. The Laboratory also performs mechanical testing of towers and other metal structures; quality testing of welds using ultrasonic, magnetic and penetration method; mechanical and electrical testing of the railway equipment; measuring vibration and testing muffling device; measuring the deformation of products and structures using tensometry method; measurement, calculation and estimation of low frequency and high frequency electric and magnetic fields and control of welding and casting technological processes.

In addition, the Dalekovod Laboratory offers consulting services in the field of management systems such as:

- **Quality Management System according to DIN EN ISO 9001**
- **Environmental management system according to DIN EN ISO 14001**
- **Equipping test laboratories in accordance with ISO / IEC 17025.**

Conceived as a separate organizational unit, the Dalekovod Laboratory for over 50 years continuously performs research and development projects aimed at improving the quality of the business and at the same time takes care of security issues such as safety at work, employee training and the supervision of environmental protection.
Dalekovod in the world

Key customers and distribution

- Projects
- Equipment delivery
Contacts

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