

2.1 Generation – Power Plants

- **Jirau HPP**, 3.750 MW, 50 Bulb turbines and 525 kV GIS, RO, Brazil;



Commissioning and commissioning certification of turbines / generators and associated auxiliary equipment, gates, gantries and cranes, equipment of the electrical and mechanical auxiliary systems, control and protection systems, communication equipment, 525 kV GIS and other plant equipment. Contractor: **ESBR**. Execution: **2012/2016**.

- **Belo Monte HPP**, 12.240 MVA, 18 Francis turbines and 525 kV GIS, PA, Brazil;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2011/2020**.

- **Palo Viejo HPP**, 99 MVA, 2 Francis turbines and 230 kV Substation, Nicaragua;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2009/2011**.

- **Changuinola I HPP**, 233 MVA, 2 Francis turbines, Panama;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, etc. Contractor: **Alstom Hydro**. Execution: **2007/2013**.

- **Ilha Solteira/Jupiá HPP**, 3.400/1.400 MVA, 20 Francis turbines/ 14 Kaplan, SP Brazil;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units 3 and 7 in Ilha Solteira and 2 and 6 in Jupuí. Contractor: **VOITH**; execution period: **2017/2019**.

- **Tornillito HPP**, 200MW, Kaplan turbines, Honduras;



Mechanical Detailed Design;
 Client: **Voith Hydro Ltda**;
 Place: Rio Ulúa, Província de San Pedro – Honduras;
 Period of Execution: Since 2018.

- **Estreito HPP**, 1.214 MVA, 8 Kaplan turbines and 525kV Substation, MA, Brazil;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2007/2011**.

- **La Vuelcosa HPP**, 612 MVA, 2 Francis turbines and 230 kV Substation, Venezuela;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **Alstom Hydro**. Execution: **2007/2011**.

- **El Platanal HPP**, 240 MVA, 2 Pelton turbines and 220 kV Substation, Peru;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2006/2011**.

- **Peixe Angical HPP**, 525 MVA, 3 Kaplan turbines and 525/138 kV Substation, TO, Brazil;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2003/2006**.

- **Guaporé HPP**, 138,8 MW, 3 Francis turbines and 138 kV Substation, MT, Brazil;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2002/2004**.

- **Corumbá IV HPP**, 129,6 MW, 2 Francis turbines and 138 kV Substation, GO, Brazil;



Executive design of installation and physical arrangements of the main and auxiliary electrical and mechanical equipment and systems, dimensioning, single-line, functional and logical diagrams and flowcharts of the auxiliary electrical and mechanical equipment and systems, piping drawings, grounding, cable ducts, wiring, lighting, etc. Contractor: **VOITH**. Execution: **2002/2004**.

- **Sobradinho HPP**, 1.167 MVA, 6 Kaplan turbines and 525/230 kV Substation, BA, Brazil;
Basic project for modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units, transformers, lighting systems, ventilation, compressed air and other auxiliary electrical and mechanical equipment of the plant. Contractor: **CHESF**; execution period: **2010/2011**.



- **Yaciretá HPP**, 3.100 MW, 20 Kaplan turbines;



Control and Protection Modernization Detailed Design (two units);
Client: **Voith Hydro Ltda**;
Place: Rio Paraná, Argentina / Paraguay;
Period of Execution: 2016 to 2017.

- **Capivara HPP**, 712 MVA, 4 Francis turbines and 460 kV substation;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2015/2019**.

- **Passo Fundo HPP**, 260 MVA, 2 Francis turbines, RS, Brazil;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2013/2015**.

- **Salto Santiago HPP**, 1.500 MVA, 4 Francis turbines PR, Brazil;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2013/2017**.

- **Chavantes HPP**, 460 MVA, 4 Francis turbines, SP, Brazil;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2013/2016**.

- **Callahuanca HPP**, 104 MVA, 4 Pelton turbines and 60/220 kV Substation, Peru;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2005/2007**.

- **Salto Grande HPP**, 138 MVA, 3 Kaplan turbines and 88 kV Substation, SP, Brazil;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2002/2004**.

- **Jurumirim HPP**, 107,4 MVA, 2 Kaplan turbines and 88 kV Substation SP, Brazil;



Executive project for the modernization of control and protection equipment and systems, speed regulation, excitation and voltage regulation, electrical and mechanical instrumentation and auxiliaries for generating units. Contractor: **VOITH**; execution period: **2002/2004**.

2.2 Power Transmission

- **Replan Substation**, 440 kV;



Basic Design and Electrical, Mechanical and Civil Detailed Design;
Client: **CTEEP – Companhia de Transmissão de Energia Elétrica Paulista**;
Local: São Paulo – Brazil;
Period of Execution: 2012 to 2016

- **BH Calafate Substation**, 138/13,8 kV, 80 MVA, SF6 Gas Insulated Equipment;



Basic Design and Electrical, Mechanical and Civil Detailed Design;
Client: **SIEMENS LTDA**;
Local: Belo Horizonte – MG – Brazil;
Period of Execution: 2012 to 2015

- **Itapeti Substation**, 345-230-88/138 kV, 1,200 MVA;



Basic Design and Electrical, Mechanical and Civil Detailed Design;
Client: **CTEEP ISA-Pinheiros S/A**;
Place: São Paulo – Brazil;
Period of Execution: 2011 to 2014.

- **Substations Araras** 440-138 kV, 600 MVA; **Getulina** 440-138 kV, 300 MVA; **Mirassol II** 440/138 kV, 300 MVA; **Atibaia II** 345-138 kV; 400 MVA and **Piratinga II** 345-88/138 kV, 1200 MVA.



Systems Study, Basic Design and Electrical, Mechanical and Civil Detailed Design;
Client: **ISA-Pinheiros S/A**;
Place: São Paulo – Brazil;
Period of Execution: 2008 to 2014.

- **Araraquara Substation 2** 500/440 kV, 3750 MVA; HVDC Transmission of Madeira River;



Systems Study, Basic Design and Electrical, Mechanical and Civil Detailed Design;
Client: **Araraquara Transmissora de Energia S/A**;
Place: São Paulo – Brazil.
Period of Execution: 2009 to 2013.

- **Anhanguera Substation**, GIS, 345/230-88/138 kV, 1,700 MVA;



Electrical, Mechanical, Civil and Architectural Detailed Design;
Client: **CTEEP - Companhia de Transmissão de Energia Elétrica Paulista**;
Place: São Paulo – Brazil;
Period of Execution: 2005 to 2008.

- **Substations Sobral II** , 230 kV and **Sobral III** , 550/230 kV, 600 MVA;



Electrical, Mechanical and Civil Extension Detailed Design;
 Client: **CHESF – Companhia Hidro Elétrica do São Francisco**;
 Place: Ceará – Brazil;
 Period of Execution: 2004 to 2005.

- Substations of the Interconnection Southeast – Northeast: **Serra da Mesa**, 500 kV; **Bom Jesus da Lapa I**, 230 kV, **Rio das Éguas**, 500 kV; **Bom Jesus da Lapa II**, 500/230 kV, 300 MVA; **Ibicoara**, 500 kV and **Sapeaçu**, 500/230 kV, 600 MVA;



Electrical, Mechanical and Civil Detailed Design;
 Client: **TSN – Transmissora Sudeste Nordeste S/A**;
 Place: Minaçu - GO to Cruz das Almas – BA – Brazil;
 Period of Execution: 2001 to 2003.

2.3 Metro and Railway Transportation

- **CPTM Lines 7-Ruby, 8-Diamond, 9-Emerald, 10-Turquoise, 11-Coral, 12-Sapphire and 13-Jade**;



Supervision, control and engineering services of the supply and installation of Readjustments and Expansion of Traction Power Supply System of the CPTM Lines 7, 8, 9, 10, 11 12 and 13;
 Client: **Companhia Paulista de Trens Metropolitanos – CPTM**;
 Place: São Paulo – Brazil;
 Period of Execution: Since 2013.

- **METRÔ-SP Monorail Line 17 – Gold** (Stretch Jabaquara to Morumbi, Station Congonhas Airport and Depot);



Basic Design of electrical power distribution and Supervision of detail design of electrical power distribution, auxiliaries, telecommunications systems and technical assistance for installation, inspection and commissioning tests services ;
 Client: **Companhia do Metrô de São Paulo – METRÔ**;
 Place: São Paulo – Brazil;
 Period of Execution: Since 2011.

- **METRÔ-SP Monorail Line 15 – Silver** (Stretch Vila Prudente to Cidade Tiradentes and Depots);



Basic Design of electrical power distribution and Supervision of detail design of electrical power distribution, auxiliaries, telecommunications systems and technical assistance for installation, inspection and commissioning tests services ;
 Client: **Companhia do Metrô de São Paulo – METRÔ**;
 Place: São Paulo – Brazil;
 Period of Execution: 2011 to 2021.

- **CPTM Line 13 – Jade** (Stretch Eng Goulart to Guarulhos Airport);



Basics design for the of Traction Power Supply System, and technical assistance for implementation of the supply and installation of Traction Power Supply System;

Client: **Companhia Paulista de Trens Metropolitanos – CPTM**;

Place: São Paulo – Brazil;

Period of Execution: 2013 to 2019.

- **METRÔ - SP Line 6 - Orange** (Stretch Brasilândia to São Joaquim);



Basics and detailed design for the ventilations systems included 1D and (3D + EVAC) simulations;

Client: **MHI – MITSUBISHI SISTEMAS DE TRANSPORTES DO BRASIL**;

Place: São Paulo – Brazil;

Períod of Execution: 2014 to 2016.

- **METRÔ-SP Line 2 – Green** (Stretch Vila Prudente to Dutra and Depot);



Basic design of electrical power distribution and auxiliary systems;

Client: **Companhia do Metropolitana de São Paulo - METRO**

Place: São Paulo – Brazil;

Period of Execution: 2012 to 2015.

- **Metrô do Rio de Janeiro Line 4** (Stretch Deodoro to Jardim Oceânico);



Detail design for the of Traction Power Supply System, and technical assistance for Simulation for the Traction D.C. systems;

Client: **CCRB - Consórcio Construtor Rio Barra e CL4S – Consorcio Linha 4 Sul**;

Place: Rio de Janeiro – RJ – Brazil;

Period of Execution: 2013 to 2015.

- **Metrô do Rio de Janeiro** (Maintenance Center, and North, East and West Depots)



Studies and Simulation for the Traction D.C. systems;

Client: **METRÔRIO – Concessão Metroviaria do Rio de Janeiro**;

Place: Rio de Janeiro – RJ – Brazil;

Period of Execution: 2015.

- **METRÔ-SP Line 4 – Yellow** (Stretch Vila Sonia to Luz);



Basic design of auxiliary systems, supervision of detailed design and technical assistance for implementation and installation, inspection and tests advisory services;

Client: **Companhia do Metropolitana de São Paulo - METRO**

Place: São Paulo – Brazil;

Period of Execution: 1994 to 2015.

- **METRÔ OF SALVADOR-BA** (Stretch Lapa to Campo da Pólvora);



Basic and Detail design of the stations and tunnel ventilation system.

Client: **EFACEC do Brasil Ltda.**

Place: Salvador - BA- Brazil;

Period of Execution: 2010 to 2014.

- **CPTM Lines 7-Ruby, 8-Diamond, 9-Emerald, 10-Turquoise, 11-Coral and 12-Sapphire;**



Supervision of the Supply and Installation of Signaling System (CBTC) lines 8, 10 and 11; and Trains Automatic Operation System (ATO) the lines 7, 9 and 12; and telecommunications systems of CPTM ;

Client: **Companhia Paulista de Trens Metropolitanos – CPTM;**

Place: São Paulo - Brazil;

Period of Execution: 2010 to 2013.

- **METRÔ - SP Line 6 - Orange** (Stretch Brasilândia to São Joaquim and Depots);



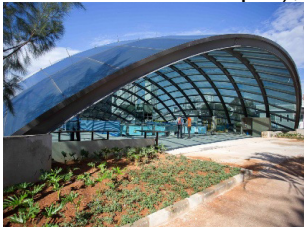
Basics design of electrical power distribution system;

Client: **Companhia do Metropolitana de São Paulo - METRO**

Place: São Paulo - Brazil;

Period of Execution: 2009 to 2012.

- **METRÔ – SP Line 5 - Lilac** (Stretch Largo Treze to Chácara Klabin and Guido Caloi Depot);



Basic design of electrical power distribution and auxiliary systems;

Client: **Companhia do Metropolitana de São Paulo - METRO**

Place: São Paulo - Brazil;

Period of Execution: 2009 to 2010.

- **METRÔ-SP Line 2 – Green** (Stretch Ana Rosa, Alto do Ipiranga, Vila Prudente and Tamanduateí Depot);



Basic design of auxiliary systems, supervision of detailed design and technical assistance to the implementation of electrical, electronic and mechanical systems on the field, and detailed design of electrical feed and ventilation;

Client: **Companhia do Metropolitana de São Paulo - METRO**

Place: São Paulo - Brazil;

Period of Execution: 2005 to 2009.

- **CPTM Line 8 - Diamond** (Stretch Imperatriz Leopoldina to Jardim Silveira);



Basic design of adequacy of functional existing stations;
 Client: **Companhia Paulista de Trens Metropolitanos – CPTM**;
 Place: São Paulo - Brazil;
 Period of Execution: 2005 to 2007.

- **CPTM Line 9 - Emerald** (Stretch Jurubatuba to Grajaú);



Basic design and Civil Infrastructure Detailed Design;
 Client: **Companhia Paulista de Trens Metropolitanos – CPTM**;
 Place: São Paulo - Brazil;
 Period of Execution: 2005 to 2007.

- **CPTM Line 10 - Turquoise** (Stretch São Caetano to Santo André);



Basic design and functional adaptations of the stations São Caetano and Santo André;
 Client: **Companhia Paulista de Trens Metropolitanos – CPTM**;
 Place: São Paulo - Brazil;
 Period of Execution: 2005 to 2007.

- **NYC Subway**;



Inspection services for R160 passenger cars of the New York Metro, manufactured by Alstom in São Paulo - Brazil;
 Client: **LTK Louis T. Klauder and Associates / NYCT New York City Transit Authority**;
 Place: Nova York – USA;
 Period of Execution: 2003 to 2005.

- **METRÔ – SP Line 5 - Lilac** (Stretch Capão Redondo to Largo Treze and Capão Redondo Depot);



Detail design of electrical power distribution and auxiliary systems;
 Client: **TTRANS Sistemas de Transportes SA**
 Place: São Paulo - Brazil;
 Period of Execution: 2001 to 2003.

- **METRÔ-SP Line 3 – Red** (Stretch Arthur Alvim to Guaianazes and Depots);



Basic design of electrical power distribution systems and Detail design of electrical power distribution systems and hydraulic installations;
 Client: **Companhia do Metropolitana de São Paulo - METRO**
 Place: São Paulo - Brazil;
 Period of Execution: 1997 to 2001.

2.4 Public Works

- **Companhia de Saneamento Ambiental do Distrito Federal - CAESB;**



Studies and Basic Projects of Energy Efficiency and Operational Improvements in Units of CAESB;
Client: **CAESB**;
Place: Brasília-DF-Brazil;
Period of Execution: 2017 to 2021.

- **Estação de Bombeamento Cuíra - Venezuela;**



Studies and Detail desing of the installation of the electrical and mechanical for equipment and systems of the TUY-IV Pumping Station (Cuíra) in Venezuela;
Client: **Construções e Comercio Camargo Correa S.A.**;
Place: Brasília-DF-Brazil;
Period of Execution: 2012 to 2016.

- **Túnel Taguatinga – Distrito Federal;**



Executive project of electrical and mechanical systems of the Taguatinga road tunnel;
Client: **Reconverte / Consórcio Novo Túnel**;
Place: Taguatinga- DF - Brasil;
Period of Execution: 2020 to 2021.

- **Nova Subida da Serra Tunnel – BR-040 Road (4.6 km);**



Basic and detail design of electrical feed system, auxiliary systems and telecommunications systems;
Client: **PEC – CONCERT**;
Place: Rio de Janeiro - Brasil;
Period of Execution: 2014 to 2017.

- **Agua Negra Tunnel – Andes Mountains (14 km)**



Basic design of electrical feed system, auxiliary systems and telecommunications systems;
Client: **Bureau de Projetos e Consultoria**
Place: National Route Nº 150 – Argentina / Route Nº 41 – Chile;
Period of Execution: 2010 to 2012.

- **Tunel Morro Alto – BR-101**



Basic design and supervision of electric, electronic and mechanical systems implementation;
Client: **DNIT – ENECON**;
Place: State of Rio Grande do Sul – Brazil;
Period of Execution: 2008 to 2012.