

Design and Optimization of Overhead Transmission Lines using PLS-CADD and PLS-Tower Software

Theoretical and Practical PLS-CADD Training Course

Date

Dec. 16 to 20, 2007

Location

Sharjah, United Arab Emirates.

Who should attend

Engineers and technicians using or planning to use computer software PLS-CADD and PLS-TOWER for design, optimization, assessment, upgrade and construction of Overhead Transmission Lines. This software is currently the state-of-the-art in the industry and used by more than 800 utilities and companies in more than 80 countries. For more details regarding the software, please visit our Web site www.powline.com. Additional details and news on PLS software can be also found on <http://www.powline.com/rss/news.xml>.

Many new features have been added lately to PLS-CADD, thus increasing substantially its capabilities. All these improvements will be reviewed during this course for the benefit of previous and new users of PLS-CADD such as:

- Conductor and tower loading calculations according to a large number of international and national standards
- Multiple alignments capabilities, either separate alignments or linked alignments (tap-off from an existing tower)
- Numerous improvements to Finite Element analysis of lines and sag tensions
- Numerous options for graphical sagging and fitting conductors to LiDAR data or other survey data
- Added the capability of automatically downloading USGS DOQ and DRG imagery from TerraServer and extracting terrain data from attachments
- Modified imagery routines, etc.

Course outline

The course will last 5 days, during which the following aspects will be covered in details

- Terrain modeling, survey data, and plan-profile
- Conductor design, modeling and sag-tension calculations
- Structure modeling, geometry, strength and spans,
- Interactive line design and optimization

- Construction drawings and documents
- Assessment of existing lines and options for upgrade

This course will cover in details the use and application of PLS-CADD and partly PLS-Tower and PLS-POLE. This course also includes the theoretical basis of the engineering concepts upon which the above software is based and that are widely used in transmission line design.

The above points will be covered using practical examples and will involve active participation of trainees in order to increase the benefits of this session.

Instructor

This course will be delivered by Mr. Elias Ghannoum, an internationally renowned expert having 36 years of experience in overhead transmission line design. He worked during 27 years with Hydro-Quebec one of the most important transmission lines utilities in the world. He was involved in design and construction of lines with voltage levels from 49 kV to 800 kV as well as UHVDC lines up to ± 800 kV.

Mr. Ghannoum is Fellow of the Institute of Electrical and Electronics Engineers (IEEE), and has received Awards from CIGRE and IEEE for outstanding contributions to technical work on transmission lines and best technical paper. He had also received the Order of Merit Award from the Canadian Standards Association for his contributions to international and national standards in lines and conductors

He holds many titles and positions in International standard writing bodies and technical organizations such as:

- Chairman of the International Electrotechnical Commission (IEC), Technical Committee 7 "Overhead Conductors"
- Past Chairman of Working Group 8 of IEC/TC11 "Loading and Strength of Overhead Transmission Lines", the Technical Group responsible for writing IEC 60826
- Current chairman of Working Group MT1 responsible for maintenance of all IEC/TC11 standards
- Past Chairman of Working Group 4 of IEC/TC7 "Aluminum and Aluminum alloy stranded Conductors"
- Chair of the Canadian Standards Subcommittee C22.3 responsible for OHL standards based on reliability principles.

Mr. Ghannoum was chief transmission Engineer for Hydro-Quebec during 20 years before starting his own consultancy practice in 1997. He provided expertise to many international clients such as The World Bank, Electricité de France, ESKOM, Power Grid Corporation of India, etc. He also lectured during 15 years a graduate course on transmission line design at the University of Montreal (Polytechnique), and currently lectures special transmission courses at this university.

Acquisition of the software

Engineers can attend this course even if they have not yet acquired the subject software. The course can help them acquiring engineering knowledge in the field and understanding the capabilities provided by computer aided software PLS-CADD. For those who have not yet acquired the software, a special training version of PLS-CADD, TOWER and PLS-POLE will be made available to them during the training period only, including the required hardware key. Purchase of the software can be arranged any time by contacting Mr. Ghannoum at the address below.

Registration

If you are interested in this course and would like to register, or would like more information on the subject, you will find all the necessary details at the end of this document. You can also contact Mr. Ghannoum at the address below if you need more information about this course. Please note that the number of attendees is limited to about 15 participants in order to maximize the transfer of knowledge.

Elias Ghannoum, Consultant

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Design and Optimization of Overhead Transmission Lines using PLS-CADD and PLS-Tower Software

5-day Training course on Theoretical and Practical aspects of PLS-CADD
(including an overview of PLS-POLE and TOWER)

Detailed Daily program

DAY 1

Introduction of the Instructor Elias Ghannoum
Introduction of the attendees

Overview Of PLS software and evolution

Need to integrate and computerize all aspects of line design
PLS-CADD system overview
PLS Transmission Structure Programs overview
Presentation of completed projects

Terrain Data and Modeling in PLS-CADD

How to organize project files
View commands - opening of windows - viewing of phases and sags
Needed terrain data and surveying techniques
Prepare a terrain model
 Generate and edit feature codes data
 Generate, edit or import XYZ terrain models
 Create alignments, profiles and side profiles
 Multiple alignment options
 Create TIN terrain models
 Break lines
 XYZ vs. user-defined data
 Filtering XYZ data
 Attach DXF and Bitmaps to plan, profile or sheet
Generate, edit or import PFL terrain models
 Scan and digitize existing drawings

DAY 2

Conductor Design and Modeling

Various conductor types
Permanent deformation from overloading
Permanent deformation from creep
Effects of high temperature on creep and strength reduction
Effect of high temperature on aluminum in ACSR conductors
Conductor models in PLS-CADD

- Stress-strain charts
- Where to get conductor data
- Aeolian vibrations - design criteria to limit them
- Temperature vs. ampacity – PLS-CADD implementation of IEEE 738
- Line thermal rating

Design criteria

- Weather data
- Wind and ice loads - gust response factors, etc.
- Conductor tension limits
- Conductor and tower automatic loading based on international standards such as IEC 60826, CENELEC EN50341, ASCE 74, etc.
- Conditions for automatic sagging
- Structure loads and safety factors (loads generated using the ruling span concept)
- Structure load, particularly non-uniform loads using the flexibility of attachment points of conductors
- Conditions for checking clearances

PLS-CADD/ LITE - simplified PLS-CADD module

- Quick sag/ tension calculations
- Illustration of various sagging methods
- Create load files for structures modeled with TOWER, PLS-POLE and PLS-CADD
- Clearance between lines
- Loads on towers with many cables attached in various directions

Structures Modeling by Allowable Spans (Method 1)

- Available structure models
- Allowable spans method (Methods 1 or 2) - best for standardized designs
- Full analysis method (Methods 3 or 4) - best for assessment and upgrade
- Material lists, create and edit parts lists
- Create and edit Allowable Span (Method 1) Structures

DAY 3

Interactive Line Design

- Spot structures interactively
- String and sag conductors - Demonstrate four sagging methods
- Check clearances - vertical, between phases, galloping, etc.
- Check overall design efficiency
- Modeling of lines crossing
- Snap structures to surveyed points

Generate Construction Documents

Plan & Profile sheets, staking lists, stringing charts, offset clipping, etc.
Automatic generation of material lists
Export project data to other commercial databases

Files, backup and support

Project window
Backup / Restore backup
PLS site, news, forum, tech. support

Day 4

Modeling Existing Lines, Assessment and Refurbishing

Modeling existing lines and structures
Assessment, reconductoring, refurbishing, etc.
Links to SAPS
Limits of validity of ruling span concept
Unbalanced ice, RSL after broken conductor, marker balls,
Structure deflection, etc.

Automatic minimum cost spotting with PLS-CADD

PLS-POLE - Structure Modeling of Poles and Frames (Method 4)

Create and edit wood poles and frames
Create and edit steel poles and frames
Create and edit concrete poles and frames
Determining allowable spans of existing structure designs

DAY 5

TOWER - Steel Latticed Tower Analysis and Design

Modeling concepts
Joints, members, connections, tower wind load, conductor loads,
etc.
Handling of planar joints, mechanisms, tension-only members, etc.
Checking and modifying older designs
Automatic member design
Joint transmission/ communication use of towers

Special topics

Design and Optimization of Overhead Transmission Lines using PLS-CADD and PLS-Tower Software Theoretical and Practical PLS-CADD training Course

Registration to the training course

Date

Dec. 16 to 20, 2007

Location

This 5-day training session will take place in the Holiday International hotel Sharjah, UAE (hotel fees are the responsibility of registrants).

Cost

The registration fees for this seminar are 2800 USD per person. This price includes buffet lunch at the hotel as well as two coffee breaks per day.

Prepayment of the training course is required. Details about modes of payment and bank transfer will be sent to all persons who register.

Trainees are required to check if visas are required for them to enter the UAE and to make the required applications. Please note that no refunds will be made if any trainee cannot attend the course for personal reasons or for visa problems. Visas are the responsibilities of the trainees and those attending the course should consult with the UAE consulates for conditions. The Hotel can also help to obtain a UAE visa against the payment of a fee, but the Consultant cannot be held responsible for any problems that may occur if a visa is rejected.

Hotel details

Hotel expenses and meals are the responsibility of the attendees, except for lunch and coffee breaks during the 5 training days.

The seminar will be held at the hotel Holiday International, Sharjah, UAE

Room Rate:

Single room @Dhs 500/- nett on Bed & Breakfast Basis at Oasis Restaurant per room per night

Double room @Dhs 600/- nett on Bed & Breakfast Basis at Oasis Restaurant per room per night

Contact persons: Pierre Hanna Asst.Front Office Manager 971-050 6799844,

Location: HotelHoliday International is situated on edge of Sharjah's Khalid Lagoon-a mere 20 minutes drive from Sharjah souk(market)-shopping malls and near to the exhibition centre-Expo and beautiful corniche.

P.O.Box: 5802, sharjah,U.A.E.
Tel: 00971 6 5736666, Fax: 00971 6 5725060
Email: holintsh@emirates.net.ae

www.holidayinternational.com

Additional information

Please note that the number of attendees is limited (usually not exceeding 12-15) persons in order to increase efficiency of the technology transfer. Thus registration is on a first come basis. Once this number is reached we will not be able to accept any new registration. Should the course be cancelled for reasons due to our side, full refund shall be made to all registrants.

If you have not yet arranged to purchase the software, we will gladly take care of the same, being the PLS agent in the area. Purchased software can be delivered to the purchaser during the training session and installed on the purchaser computer. Thus payment for the course and software can be combined.

Attendees should bring their own laptop computer and the latest version of the software will be installed on these computers, to be used only during the training week (each user will given a hardware key for use during the training session).

Note that Trainees who do not have access to a laptop, can follow the course on the screen (I will be using an LCD projector that will image all the operations on my own laptop), as well as a board and flip charts.

Please advise us at the earliest about your registration. Should you need any other information, please do not hesitate to contact us at the following phone number: 1-514-344 4127.

Sincerely yours,

Elias Ghannoum, Consultant
PLS Agent for North-Africa, Middle-East and India
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Registration sheet

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Theoretical and Practical PLS-CADD training Course

Sharjah(UAE), Dec. 16 to 20, 2007

Name: _____

Company: _____

Complete Address:

Phone and fax numbers: Phone: _____

Fax: _____

Email address _____

PLS software: Please indicate if you have already purchased PLS Software, and the version of all software you have in hand.

PLS-CADD yes ___no ___ version _____

TOWER yes ___no ___ version _____

PLS-POLE yes ___no ___ version _____

Method of payment: Bank transfer _____ Date _____ amount _____

Check or money draft _____ Date _____ Amount _____

Certified check _____, Date _____, Amount _____

Date: _____

Signature _____

(Please return this registration form either by email to elias@Ghannoum.com or by fax to 1-514-344 4724)