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

Theoretical and Practical PLS-CADD Training Course

Date

March 31 to April 4, 2008

Location

Paris, France.

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 (e.g. 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 37 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 transmission line standards based on reliability principles (National Standards of Canada CAN/CSA-C22.3 No. 60826:06).

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 and registration is confirmed on a first come basis after payment of the course fees).

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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

March 31 to April 4, 2008

Location

This 5-day training session will take place in the offices of HECLA located in Cachan in the suburb of Paris. This location is very easy to reach using the high speed metro (RER B), a trip that takes about 20-25 minutes from the center of Paris (Chatelet Station).

This location is also about 5 minutes walking distance from hotel Alixia a Bourg-la-Reine located in Paris Suburb.

Cost

The registration fees for this seminar are 2800 USD per person. This price includes lunch during training days at the company's cafeteria.

Prepayment of the training course is required and no confirmed registration will be accepted unless payment is received. 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 France 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 French consulates for conditions. 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 hotel Alixia Bourg-de-la-Reine http://www.hotel-alixia.com is about 5 minutes walk form HECLA's offices where the course will take place

Room rates will be provided to interested parties.

Additional information

Please note that the number of attendees is very limited (we have only 7 places available for this course) 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 a PLS agent. 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. At the beginning of the course we will install the latest version of the software on all computers, twill provide a hardware key 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
Tel: 1-514-344 4127, Fax: 1-514-344 4724,
email:elias@ghannoum.com

Registration sheet

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

Theoretical and Practical PLS-CADD training Course
Paris-France, March 31-April 4, 2008

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)