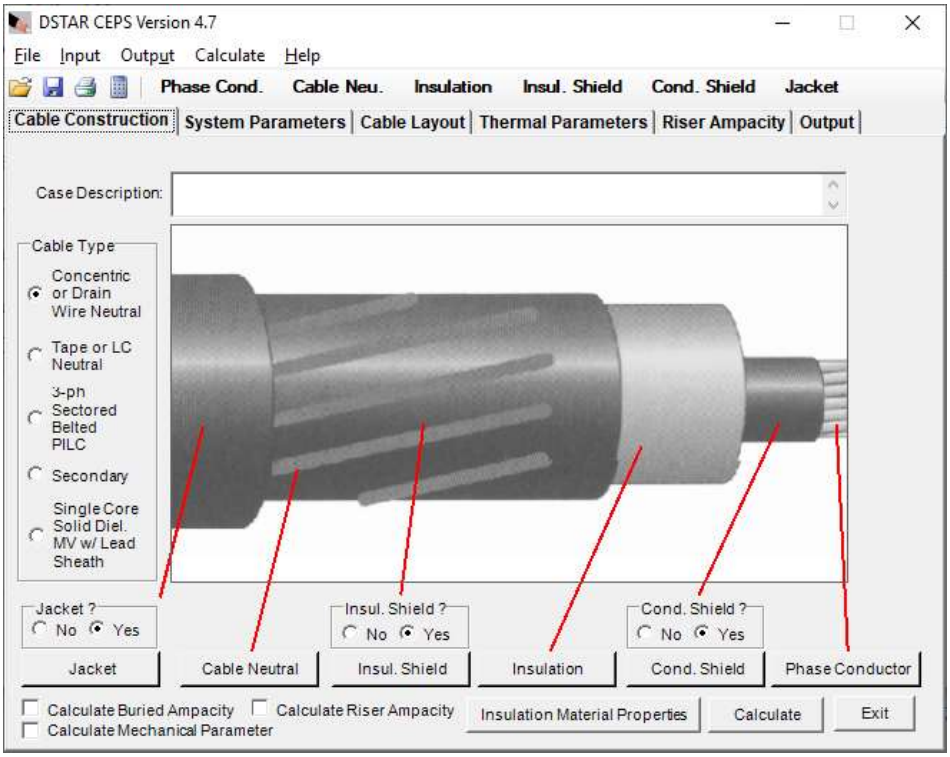
Project 14-10:
Cable Electrical Parameters Software (CEPS) Enhancements

Final Report/Software prepared August 2015; available @ www.dstar.org

Project Summary:

The Cable Electrical Parameters Software (CEPS) provides convenient calculation of underground cable parameters. A highly graphic user interface allows users to easily enter parameters and perform calculations all relevant cable electrical parameters.



The user specifies the cable construction (conductor size, stranding, insulation parameters, neutral type and design, etc.), as well as the cable installation parameters (duct spacing, duct size, trench width, etc.), and CEPS determines a wide range of cable electrical and physical parameters, including: sequence impedances, charging current, losses, voltage regulation, short-circuit current capability, overall dimensions, ampacity for directly buried, CIC, and duct bank installations, and ampacity in U-Guard and conduit risers.

For three-phase cable runs, the program also calculates sequence impedances where a separate neutral conductor is installed.

CEPS presently covers primary cables with:

- concentric
- drain wire
- tape shield
- longitudinally corrugated neutral constructions
- secondary cables
- three-phase sectored PILC primary cables

Update History:

CEPS was created in P6-6 and has subsequently been updated in P7-4, P8-2, P10-6 and P14-10 (the current update). The prior enhancement in Project 10-6 to create Version 4.5. The updates included

- New cable type for single-core solid dielectric medium voltage cables w/ lead sheath
- Riser ampacity for cables in separate risers
- Calculation of solar insolation for riser ampacity
- Increased flexibility in duct bank dimensions for buried ampacity

The enhancements in Project 14-10 created Version 4.7 and added capability to allow the user to establish seasonal (summer and winter) temperature parameters for ampacity and report the cable ampacity based upon these parameters. In addition, CEPS was updated to allow the user to enter either a load factor or loss factor and the application guide was updated to reflect the latest changes. The installer and application were also updated to work with the Windows 7 operating system.

Known Issues:

CEPS has been successfully tested on Windows 7 operating systems. The software requires the .NET Framework v1.1. Therefore, CEPS is only supported on platforms for which the .NET Framework is supported.

If you are installing CEPS 4.7 on a Windows XP and 7 computer, it will be necessary to log on to the operating system with administrative privileges to properly install all of the system files. You may need to contact your system administrator to have CEPS installed on your machine.

Please do not hesitate to inform your DSTAR representative of any bugs or issues you encounter or send an email to: dstar-support@ge.com.

Who Should Use:

Distribution Planners, Engineers, Designers, Standards Groups

For the complete report on DSTAR Project 14-10: CEPS Enhancements, visit www.dstar.org.

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