



Federal Grid Company of Unified Energy System of Russia



Using CIM/GID

Andrey Berezin, FGC UES
Konstantin Sipachev, CROC
Vyacheslav Maximov, CROC
Presented by: Ralph Mackiewicz, SISCO



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Nº 1 in Russia
in IT infrastructure creation*

CROC is No. 1 company in IT infrastructure design and implementation in Russia

- CROC is the largest Russian partner of leading global vendors of hardware and technologies for IT infrastructure such as: IBM, HP, Avaya, Cisco Systems, and CommScope
- Five years in a row, CROC has been recognized the largest IT service provider on Russian market and leading systems integration service provider in IT infrastructure design and implementation (IDC reports for 2002-2006)
- In 2005, CROC's share in Russian IT service market amounted to 5.7%, and to 23.5% in systems integration market - (IDC report for 2006)



Nº 1 in Russia
in IT infrastructure creation*

Key partners





Federal Grid Company of Unified Energy System of Russia

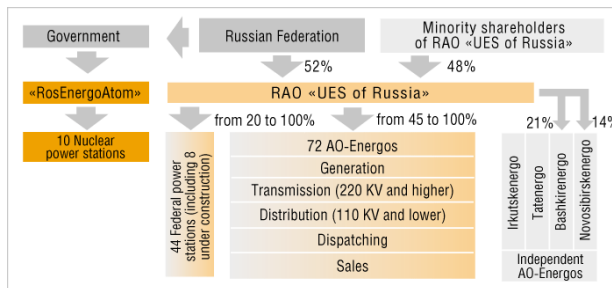
Introduction



Reforms of Power Industry of Russia



Power Sector Structure in 2000

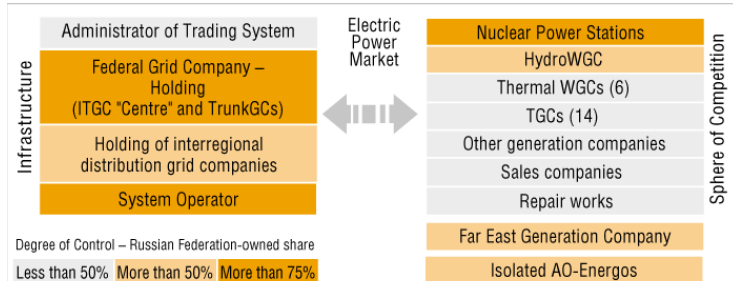


During the restructuring period power sector structure of Russia changed:

- Done separation of natural monopoly functions (power transmission, dispatching) from potentially competitive ones (production and supply, repair works and services)
- New structures responsible for separate activity types are being created instead of former vertically integrated companies which exercised all the above mentioned functions

Power Sector Structure in 2008

- Power transmission grids passed on to the Federal Grid Company (**FSC**)
- Power distribution grids where transformed into interregional distribution grid companies (**MRSK**)
- Dispatching functions transferred to the **System Operator (SO-CDU)**





- ▶ **Open Joint-stock company Federal Grid Company (FGC UES)**
was established on June 25, 2002 pursuant to the Russian Federation Government Resolution № 526 of July 11, 2001 "On Restructuring the Electric Power Industry of the Russian Federation".
- ▶ After implementation of the reform the share of the Russian Federation in the authorized capital of FGC UES will be no less than 75% + 1 voting share. FGC UES will own all transmission grids of former RAO UES Russia.
- ▶ The main purposes of FGC UES are as follows:
 - to assure the integrity of the grid technological management;
 - to develop the Unified National Power Grid (UNPG);
 - to render transmission services to market participants.



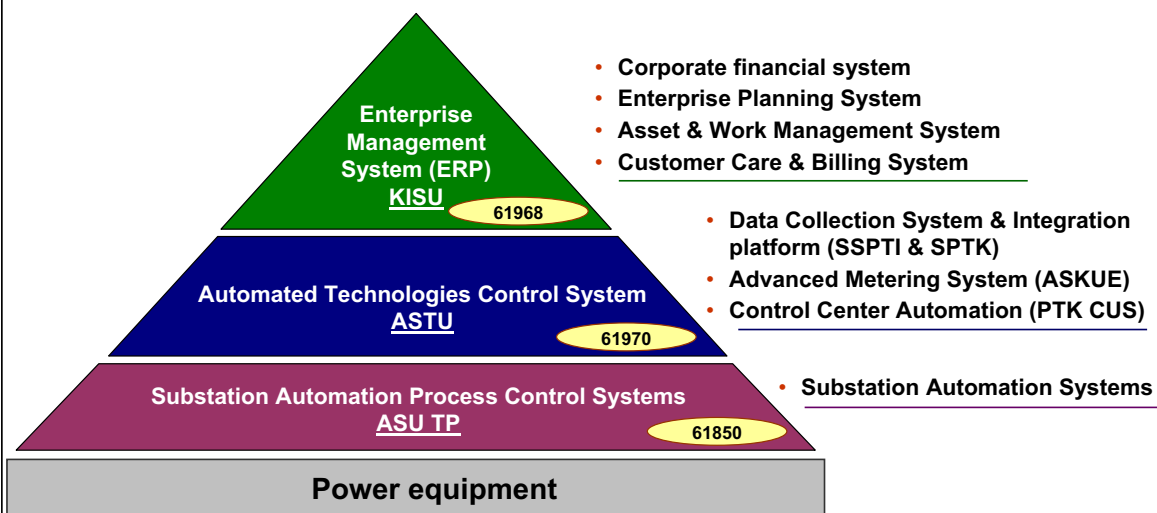
FGC UES in numbers:

- ✓ **122 000 km** of power grid lines 110kV up to 1150kV
- ✓ **751 substation** with overall transformer power above 300 000 MVA
- ✓ **433 531 740 000 kW** of transmitted active power over the UNPG in 2006

IT-strategy of FGC UES



- ✓ **FGC UES has approved Conception of Corporate IT strategy (both Conception of KISU and Conception of ASTU) with well-defined Process control- and IT- development strategy**





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Automated Technology Management System ASTU Project



Purposes of ASTU Project

Main purpose of ASTU Project – comprehensive automation of power transmission technological processes of FGC UES

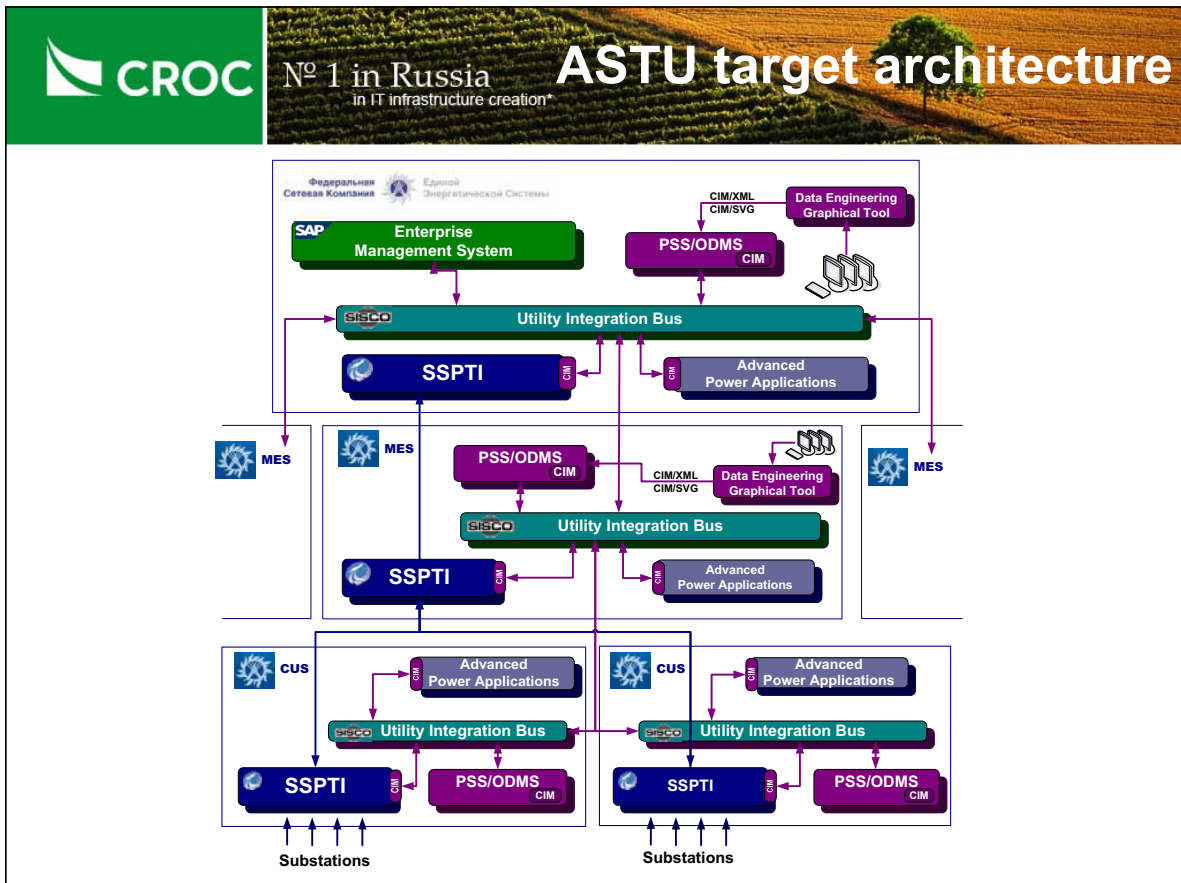
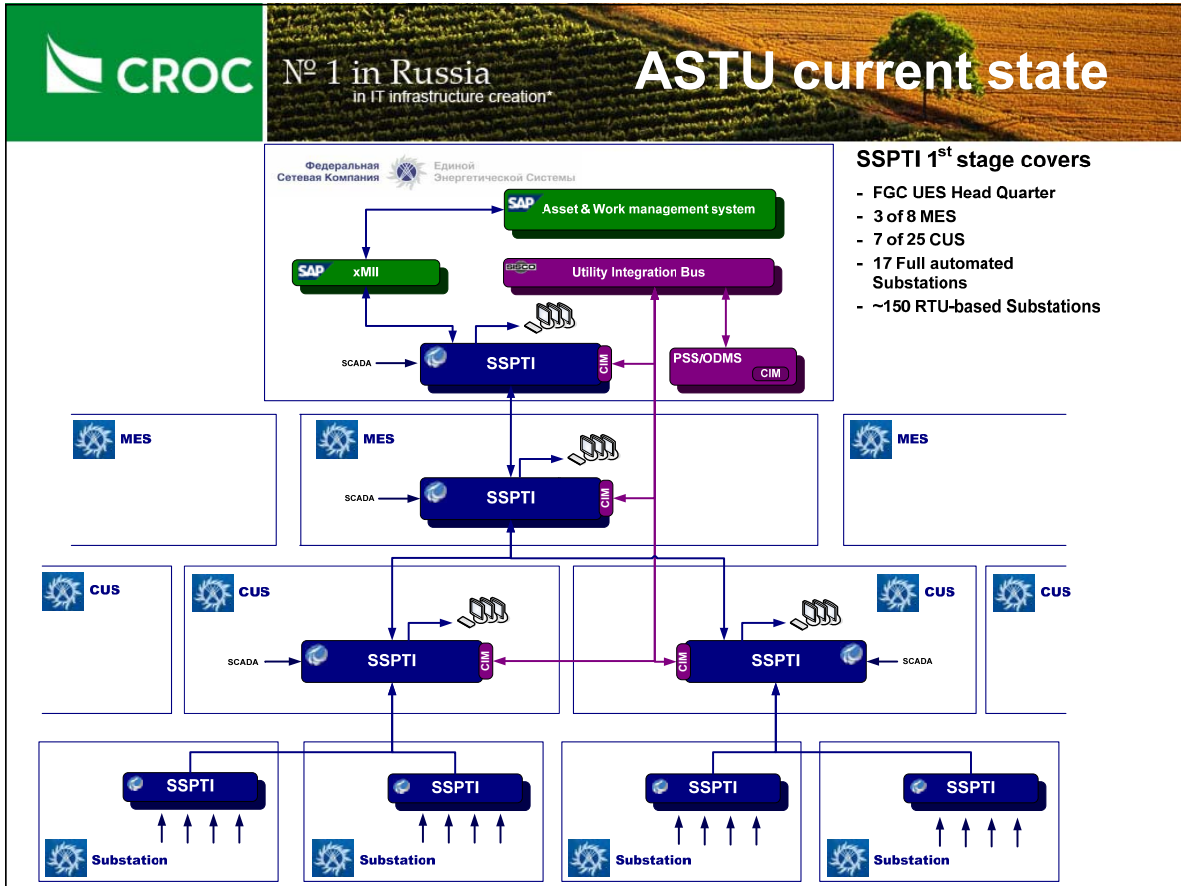
- Complex automation of operational-technological and production-technical control of processes of exploitation and development of Russian national grid networks, including organization and execution of repair, technical maintenance, reconstructions, technical upgrading and network equipment extension;
- Participation of FGC in operational-dispatch control of UNPG operating regimes (together with System Operator);
- Receipt of reliable current technological information necessary for complex automation of FGC different operations on the whole. The automation is implemented with the help of both subsystems of ASTU itself and subsystems of FGC Enterprise Management System (ERP);
- Information support of UNPG development providing that electric network characteristics (primarily, transfer capability and reliability parameters) are adequate to needs of electric power market.

ASTU functional modules

- **Energy transmission and distribution control system (SCADA/EMS/DMS);**
- **Electricity accounting, balance calculation and power losses control system;**
- **Equipment diagnostics and monitoring system;**
- **Outage and switching management system;**
- **Repair planning and management system;**
- **Geographically dispersed resources control system;**
- **Relay protection maintenance systems;**
- **Other operation and transmission maintenance systems.**

ASTU unified integration platform

- **Unite into one distributed transmission control system functional modules from all levels of FGC control hierarchy**
- **Provide unified approach to synchronize models between functional modules through standard GID interfaces**
- **Supply functional subsystems with measurements data by SSPTI data collection system**
- **Perform integration between functional modules and Enterprise management system (particularity – with Work and Asset Management)**
- **Establish data exchange with external parties – such as system operator, wholesale electricity market operator**



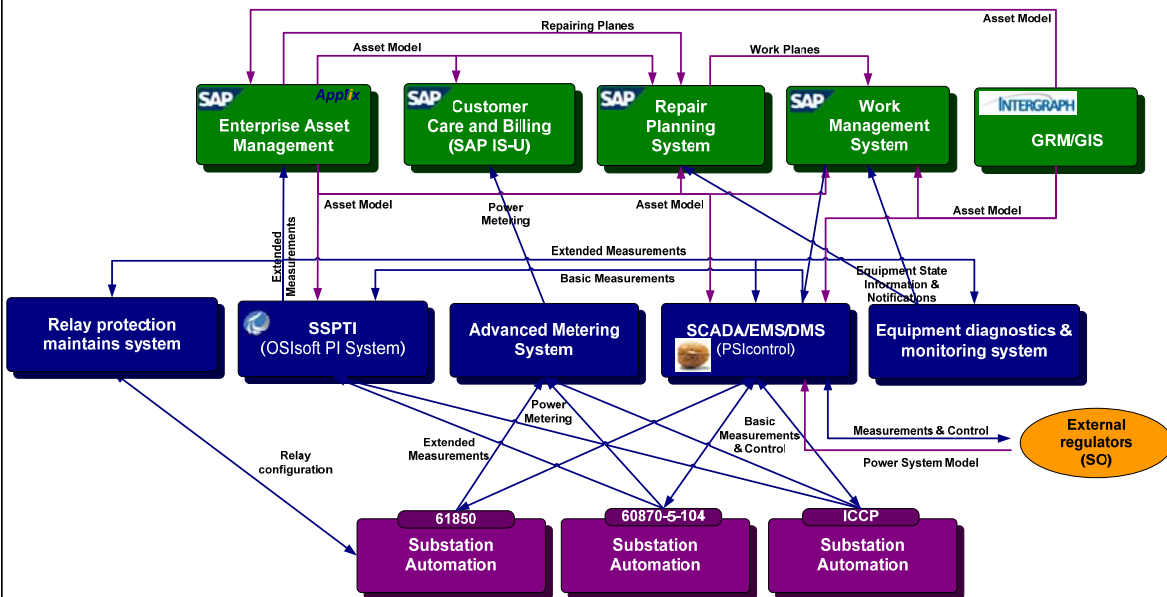


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Information exchange requirements



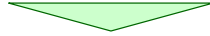
FGC UES Information exchange requirements



FGC UES Information exchange requirements

Two main types of information exchange:

- Models
- Measurements



- ▶ Must be used **one model across all subsystems**
- ▶ Must be used **standard interfaces** to exchange model and measurement data



Common
Information
Model

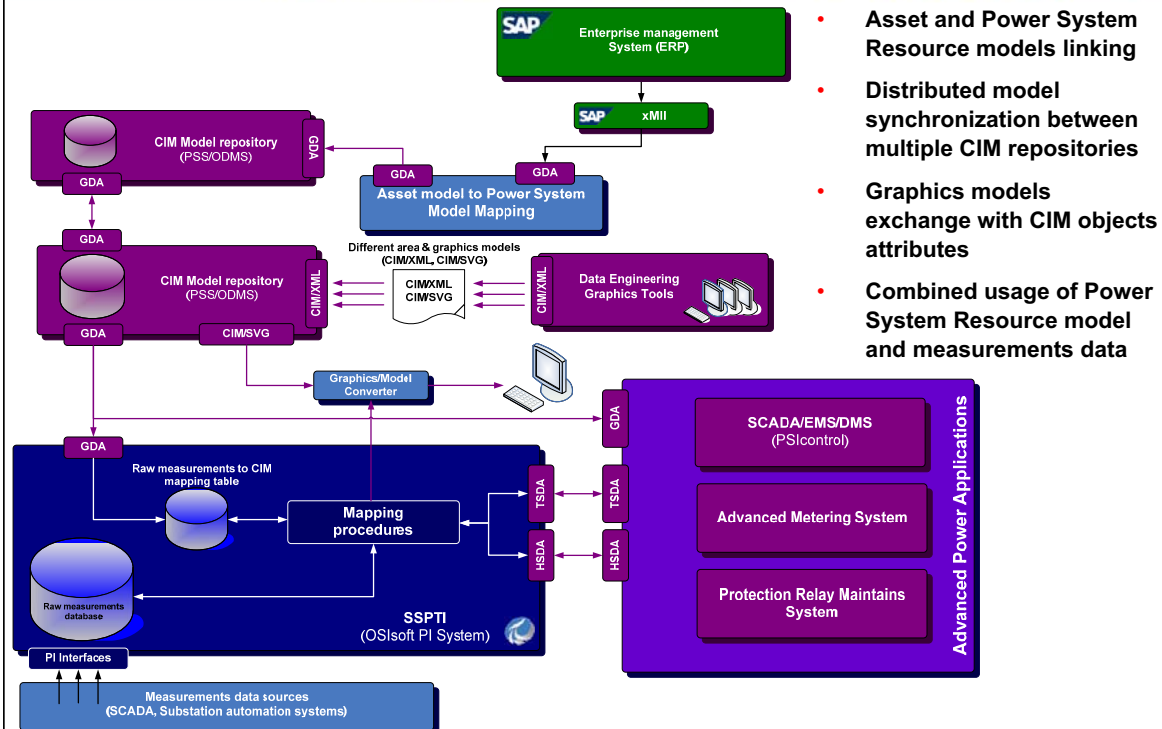
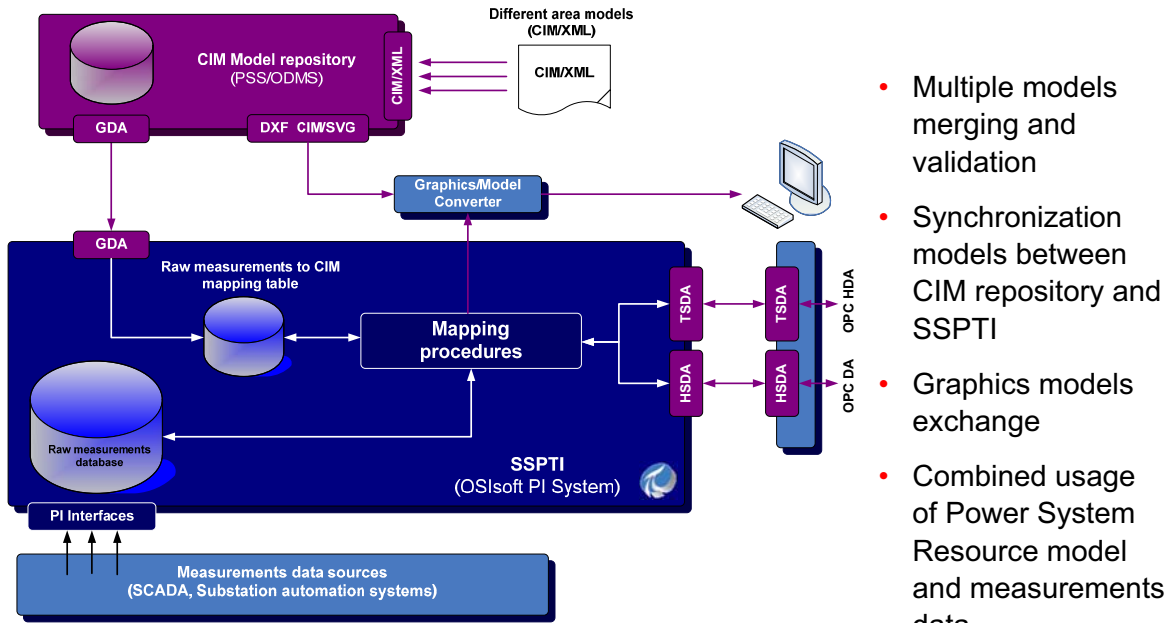
Generic
Interface
Definition



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Role of GID in ASTU Project





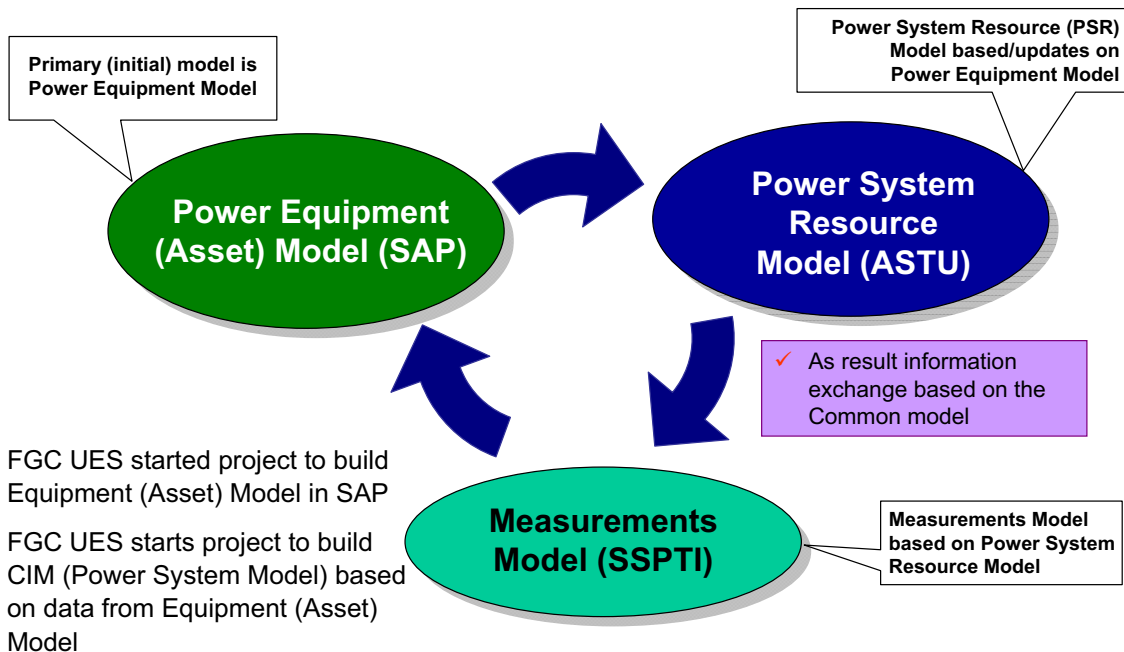


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Role of CIM in FGC UES projects

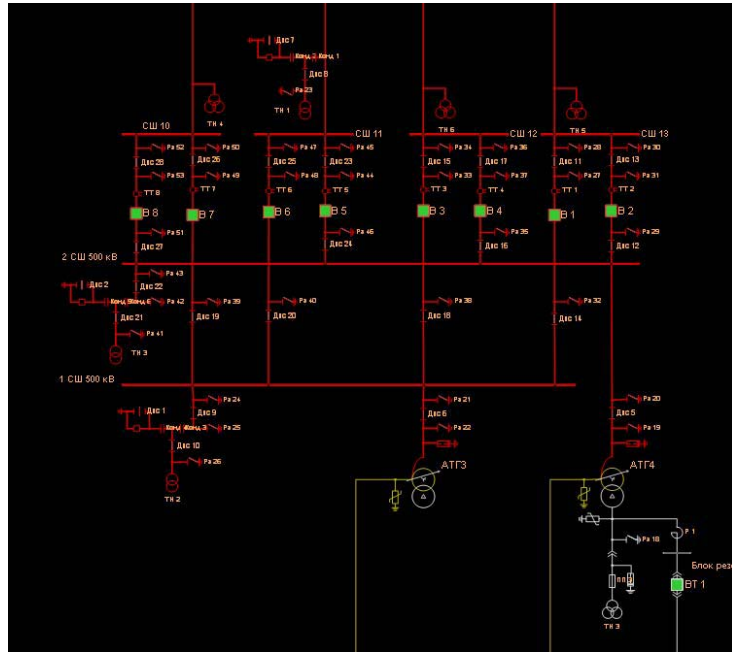


Creating and maintains CIM-model



CIM Based Graphics Exchange (CIM/SVG)

- ◆ FGC UES define common graphics library
- ◆ Substation graphics created once and reused in power applications
- ◆ CIM/SVG used as common graphics exchange format



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Current Status



Current Status – SSPTI 1st Stage

- 1st stage of SSPTI (distributed data collection system) involving FGC HQ, 3 MES control centers, 7 CUS control centers completed in 3Q2009.
 - CIM repository and integration bus to create and deploy CIM model to measurement archive in all 11 control centers.
 - FGC now requires substation SCADA to use SSPTI suite and SSPTI measurement archive for all substations.
 - 17 substations active, 10 more projects starting.

SPTK ASTU Project

- SPTK Integration Platform project underway completion in 3Q2009.
 - Integration of substation equipment models with power system models underway
 - MES North-West was the pilot location for this
- Next step is CIM Scalable Vector Graphic (SVG) exchange for one-line diagrams.
 - Work started within PSS/ODMS

New AMI Pilot Project

- FGC's AMI system will be integrated with the CIM repository to implement bi-directional synchronization with substation topology and equipment with customer meters, measurements, and graphical representations.
- Pilot project first phase 4Q2009.
- Results of all projects will guide future activities.

Thank you!