

### 6.3 Offline Systems - Graphic Information Systems

In the 70<sup>th</sup> and the 80<sup>th</sup> in most big utilities in Germany and industrialised countries there have been two computer systems been operated:

- IBM computers for commercial and administrative tasks
- Processing computers for operational tasks in the LDC/SCC
- Technical scientific and planning calculation have been done at first on the IBM

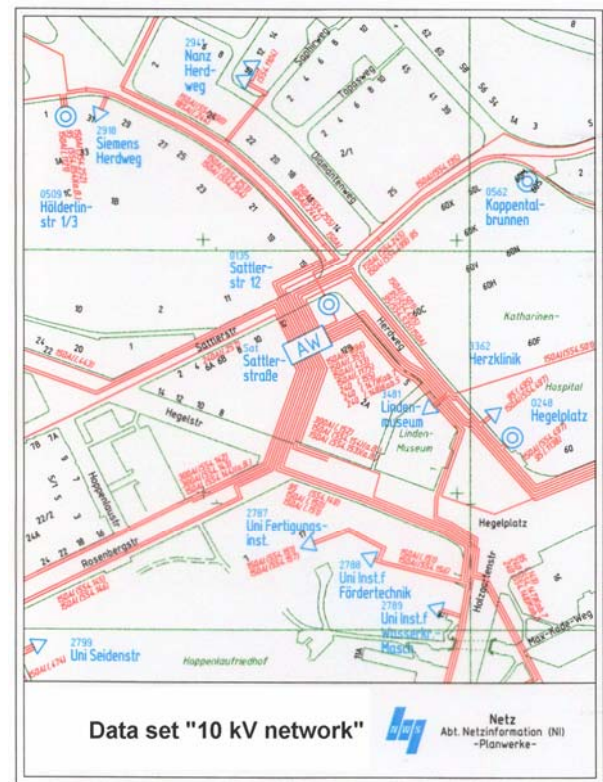
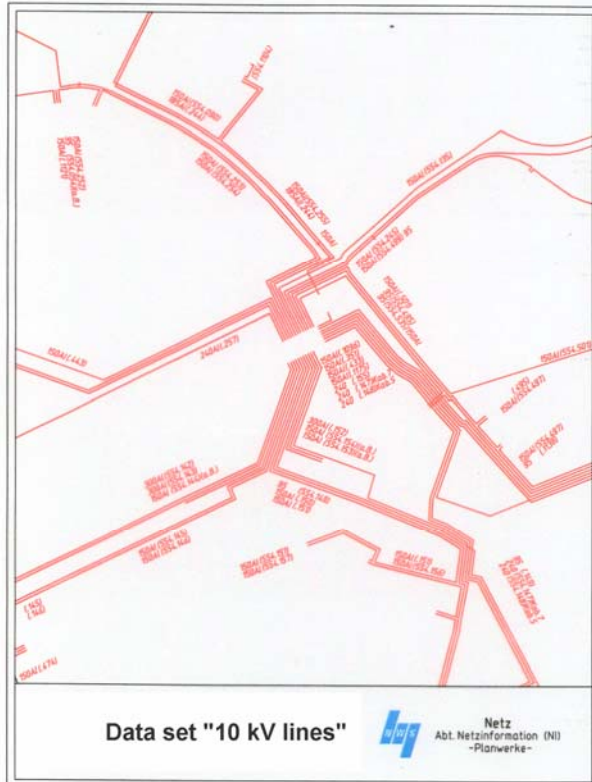
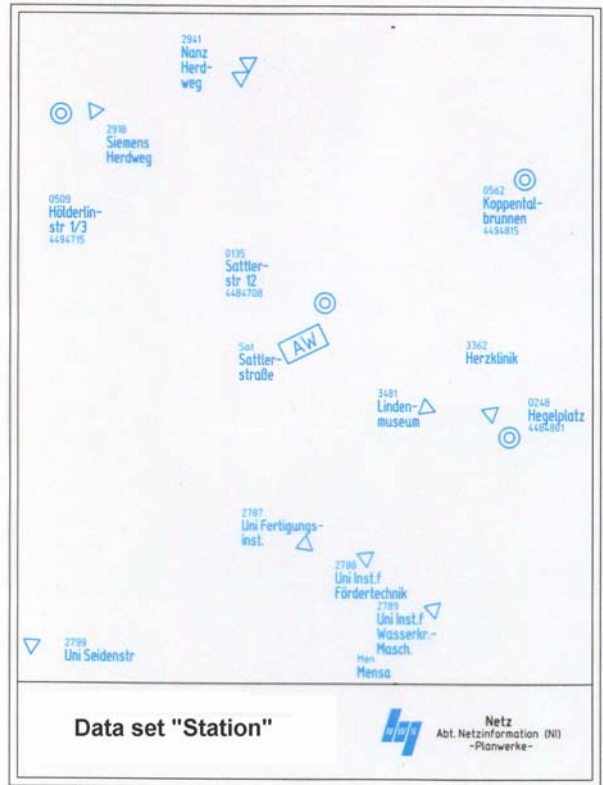
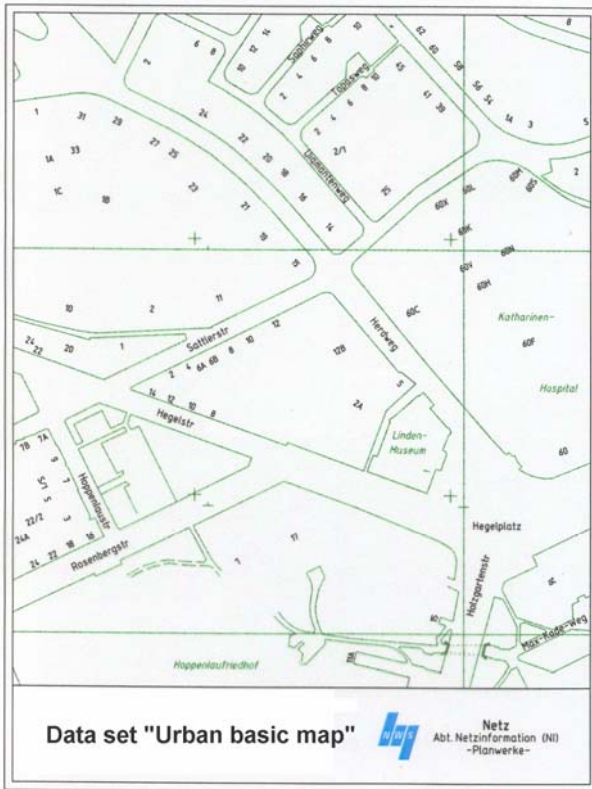
#### Graphic Information System (AF/FM) as a system for technical offline use

- .... 1983 - city maps with correct street documentation, printed on transparent base material.
  - transparent overlays with additional utility information
  - reproduction by copying both together;
  - disadvantage:
    - fixed scale
    - addition of graphic information difficult
    - blunt reproduction
    - .....
- 1983 .... - digital city maps as base documentation, produced in co-operation with the responsible city administration
  - precise documentation with an uncertainty of a few cm
  - general view maps
  - utility information are documented in a lot of separated levels to be added or removed
  - ⇒ scale free reproduction *only* of the *wanted* information
  - ⇒ high dissolution of information

#### Network Information System

Networks with lines and stations are documented in about 128 levels

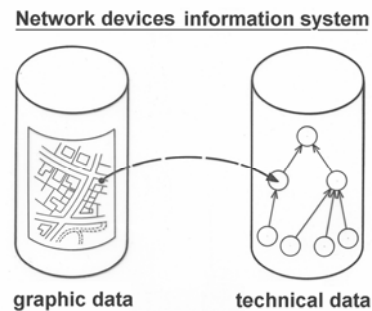
- LV lines
- cable distribution boxes
- pilot cable
- .....
- MV lines
- transformer stations
- .....
- generalised LV lines
- generalised MV lines
- .....



Calculation programs allow to determine the length of the lines.

Introduction of a **data bank** with all information concerning entities like

- lines
- switchgear
- transformer
- transformer stations
- .....



Connecting the data bank entities with the graphic information system

- ⇒ identification of elements in the graphic maps
- ⇒ reproduction the information on screen or paper, both.
- ⇒ calculation programs take information from the data bank
- ⇒ information system for all technical data

Attention:

- ⇒ it needs a lot of time to digitise analogue documentation (maps)
- ⇒ for economical reasons a fast use of the system is necessary
- ⇒ today, systems with specific standard software and standard hardware allow an easy introduction as important part of a distributed utility wide data management system

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Folgende Informationen stehen Ihnen zur Verfügung:

- [Anlagen](#)
- [Leitungen](#) (ab 10 KV), [Niederspannungsnetz](#) und [Signalleitungen](#)
- [Anschlüsse](#) (Strom), Einstieg über [Straßen](#)
- [Planwerke](#)
- Zugang zum [VIP-Bereich](#) (nur mit Berechtigung)
- **i** Informationen:
  - [Hilfe und Infos zum System](#)
  - [Infos über Änderungen am System](#) (zuletzt 15.09.1999)

**Optimising Planning Calculation** - In the 80<sup>th</sup> / 90<sup>th</sup> realised for MV and LV networks

\* **ODIN (Optimising Dynamic Interactive Network Planning)**

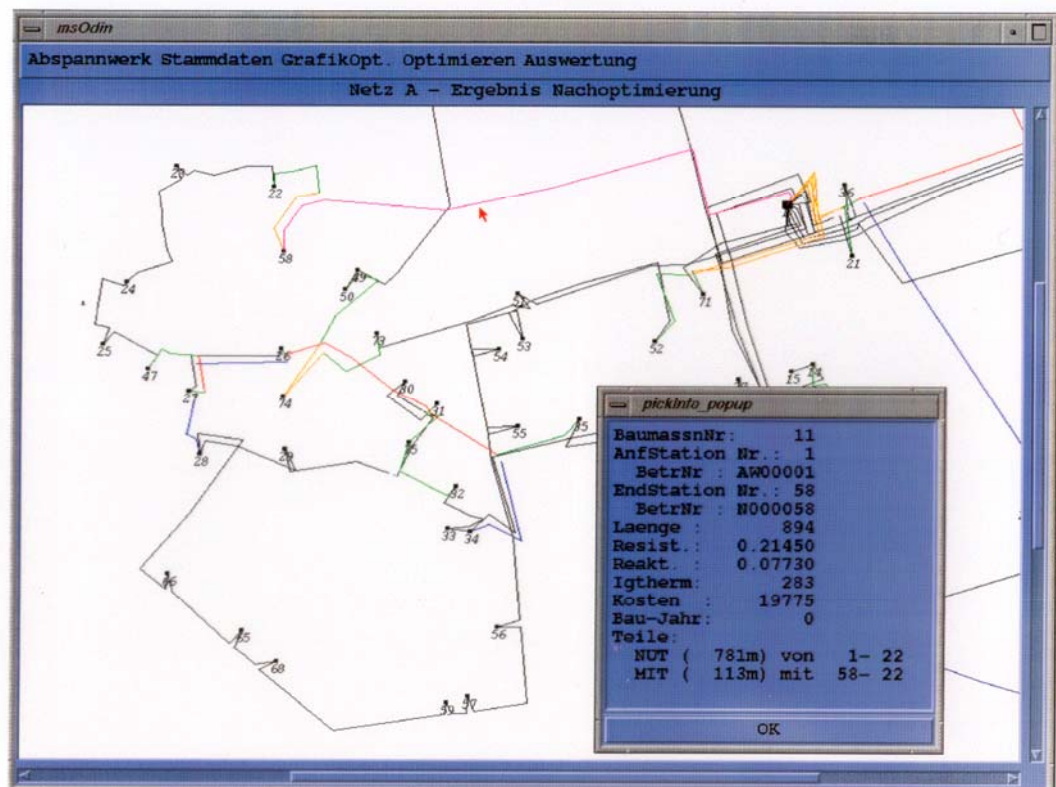
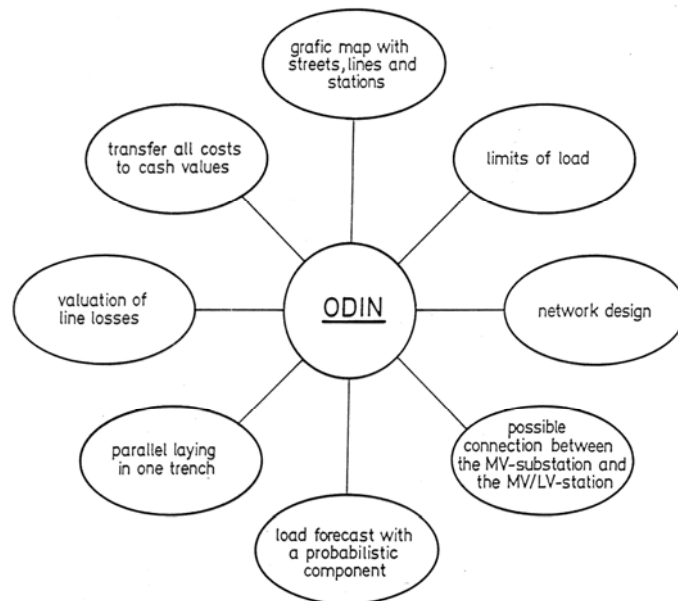
- MV cable networks
- ring network configuration
- based on graphic maps
- from load forecast ... to life time costs minimised proposals (investments, installation condition, losses)

O ptimum

D ynamic

I nteractiv

N etwork Planning



\* **IONN (Interactive Optimising LV Networks)**

- LV networks
- meshed network configuration and combination with others
- optimising the separation points between LV network islands
- comparable performance like ODIN

**Circuit Diagrams for Substation Devices**

- digital documentation allows flexible addition or modification
- detailed information are stored and can be re-produced easy and flexible
- selecting programs for analysing the overall information
- logical tests for certifying the correct wiring and interlocking circuits by simulation
- documentation exchange with the producer by CD

**Company Integrated Information System**

- installation and operating an internal information system network (LAN)
- fibre optic cables for longer distances or for connecting computers
- special cables for connecting the users (PC) with the servers
- computer with high performance
- redundant, decentralised configuration
- software base to integrate all used programs, including accounting, billing, SAP, technical data
- ⇒ organising the access permission
- ⇒ installing fire walls
- ⇒ "only read", "read & write" permission to be administrated

Principle: The user has access from his PC to all data he needs to do his work effectively and without restrictions.

