

PSI Energy Oil & Gas
Reference List
Control and Energy Management Systems

PSI 

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Gasunie Deutschland GmbH & Co. KG
Hannover



New network control system *PSIControl V7* for optimising and monitoring the network. System includes integrated gas transport management system *PSITransport* and gas network simulation system *PSIGanesi*.

2009-2010

Adria-Wien Pipeline GmbH
Vienna (A)



New control system for AWP's crude oil pipeline with higher functionalities tankfarm management, online simulation, batch and pig tracking and training.

2009-2010

Transneft Ltd
Kalinovy Kljutsch



Leak detection and location system for a crude oil pipeline.

2008-2009

RWE Westfalen Weser Ems Netzservice GmbH
Dortmund



Turnkey delivery of gas tracking system *PSIGanproda* with type approval by German certification authority and operational support.

2008-2009

N.V. Nederlandse Gasunie
Amsterdam



PSI, in close cooperation with Gasunie, analysed the old IT environment used for representing "Meter-to-Bill" business processes and created a detailed specification based on a modern and flexible solution concept using PSI standard products.

2008-2009

RWE Systems
Dortmund



Migration to new process control system *PSIControl V7*. System includes integrated gas transport management system *PSITransport* and gas business communication system *PSIComCentre*.

2008-2009

E.ON Ruhrgas AG
Essen



The project included the integration of E.ON D-Gas, where the business processes are based in The Haag, in the DAISY trading system. The technical focus of the integration project was the appropriate differentiation of the various user groups in regards to their external business communication.

2008

E.ON Ruhrgas AG
Essen



PSI customised the components *PSITransport*, *PSIComCentre* and *PSITransact* for E.ON Gastransport to meet the new requirements of the Energy Industry Act.

2008

Euro-Arab Mashreq Gas Market Project (EU funded)
Damascus



PSI *Ganesi*-Planningsystem for steady state and transient gas network calculations with implementation and user education at Syria.

2008

E.ON Ruhrgas AG
Essen



Realisation of integrated gas quantity tracking system *PSIReko* based on SCADA system *PSIControl V7* with online interface to the gas billing infrastructure and type approval by German certification authority PTB.

2007

RWE Westfalen Weser Ems Netzservice GmbH
Dortmund



Turnkey delivery of gas tracking system *PSIGanproda* with typ approval by German certification authority PTB and operational support.

2007

E.ON Gastransport AG & Co. KG
Dortmund



New accounting grid functionality based on *PSITransport* and *PSIComCentre*.

2007

**E.ON Hanse AG
Hamburg**



Disaster tolerant realisation of PSIGamess and PSIComCentre.

2007

Gazprom Transgaz-Kuban



Implementation of three process control systems for the dispatching centre of Kuban-gazprom in Krasnodar with online process connection to the control systems of Gazavtomatika/ZOND2000 and Siemens/PCS7. Introducing a 3-level control concept.

2007

Gazprom Topenergy



Commissioning of one PSIComCentre for transfer of commercial data to the dispatching centre of Gazprom in Sofia (Bulgaria).

2007

**EnBW Gas GmbH
Stuttgart**



Turnkey delivery of gas transport management system PSITransport and message handling module PSIComCentre with online interface to the existing SCADA system.

2007

**Kuwait Oil Company,
Kuwait**



Leak detection and location system for the countrywide gas and condensate pipelines of Kuwait Oil Company KOC.

2006 - 2008

**RMR mbH,
Cologne**



Upgrade of all computer hardware for the control system of RMR's product pipeline during normal pipeline operation.

2006 - 2007

**E.ON Thüringer Energie AG,
Erfurt**



Migration gas data management system PSIGamess to a corporate network solution with redundant realisation and online interface with gas business in-house data warehouse system.

2006 - 2007

**VNG AG,
Leipzig**

Migration to new process control system *PSIControl V7*. System includes integrated gas transport management system *PSITransport* and message handling module *PSI-ComCentre*



2006 - 2007

**AGGM AG,
Vienna (A)**

Gas grid management system including *PSIControl SCADA* system as well as gas transport management system *PSITransport*, message handling module *PSIComCentre*, gas network simulation and closed loop control.



2006 - 2007

**Bayer Industrial Services,
Leverkusen**

Load management system including optimisation of supply contracts.



2006 - 2007

**DREWAG,
Dresden**

Migration to new process control system *PSIControl V7*. System includes integrated gas simulation system *PSIGanesi*.



2006 - 2007

Gazprom Transgaz-Kavkaz

Commissioning of two process control systems for the dispatching centre of Kavkaz-transgaz in Stavropol with online process connection to the control systems of Gazavtomatika/ZOND2000 and Siemens/PCS7. Introducing a 3-level control concept.



2006

**RWE Westfalen Weser Ems Netzservice GmbH
Dortmund**

Feasibility study for online simulation and gas quantity tracking for billing purposes for RWE with gas network calculations, analysis of measurement infrastructure and realisation proposals.



2005 - 2006

**E.ON AVACON AG,
Salzgitter**

Migration to new process control system *PSIControl V7*. System includes integrated gas transport management system *PSITransport*, message handling module *PSICom-Centre*, gas network simulation and closed loop control.



2005 - 2006

**Mitteldeutsche Gasversorgung GmbH (MITGAS),
Halle (Saale)**



Migration to new process control system PSIControl V7. System includes integrated forecasting function.

2005 - 2006

Process coupling will be carried out in the future by PSIGames.

**E.ON Hanse AG,
Hamburg**



Migration to new process control system PSIControl V7. System includes integrated gas transport management system PSITransport and message handling module PSIComCentre.

2005 - 2006

**E.ON Ruhrgas AG,
Essen**



Realisation of a Control and Information System for trading dispatching of E.ON Ruhrgas AG in the liberalized market based on PSIControl V7, contract management system PSITransact und business message exchange using PSIComCentre.

2005 - 2006

**OMV Deutschland,
Burghausen**



Pipeline leak detection and location system including batch tracking, pig tracking, and visualisation of hydraulic profiles for OMV's crude oil and product pipeline system.

2005 - 2006

**Gasversorgung Thüringen GmbH (GVT),
Erfurt**



Sub-network oriented gas property billing with PSIGanesi.

2005

**Wingas GmbH,
Kassel**



Development of a gas industry web-portal for a liberalised gas market.

2004

**Steirische Gas-Wärme GmbH,
Graz (A)**



Delivery of a modular dual operational control system for traders and network operators based on PSIControl V7 including various trader modules (i.e. contract groups, balance groups, scheduling and forecasting).

2004 - 2005

**Ruhrigas AG,
Essen**

Realisation of the complete renewal of the Dispatching Control and Information System based on PSIControl V7, contract management system PSITransport und business message exchange using PSIComCentre. Fully integrated energy management including simulation and optimization.



**MAINOVA AG,
Frankfurt**

New process control system PSIControl V7 for the major gas supplier of the Rhein-Main area. System includes integrated gas network simulation PSIGanesi and integrated gas transport management system PSITransport.



**AVACON AG
Salzgitter**

Upgrade of TM system. Integration of a 3rd party system and interface to SAP I J-U. Contracting authority was is-Energy.



**Wingas GmbH,
Kassel**

Reconstruction system for determining gas property data for billing. Acted as consultants during weights and measures certification.



**SW Karlsruhe,
Karlsruhe**

Gas data retrieval and processing with PSIGamess and integrated data retrieval.



**Gasversorgung Thüringen GmbH (GVT),
Erfurt**

Gas data retrieval and processing with PSIGamess and integrated data retrieval as well as mobile data acquisition and technical quantity determination.



**Stora Enso Maxau GmbH & Co. KG,
Karlsruhe**

Gas data retrieval and processing with PSIGamess and integrated data retrieval.



**Hamburger Gaswerke GmbH (HeinGas),
Hamburg**



Delivery of PSITransport transport management system and integration with existing PSIControl. 2003

**RWE Gas AG, Kavernenspeicher Staßfurt GmbH.
Kalle, Staßfurt**



Remote monitoring of storage control system. Upgrade of two-way unmanned operations. 2003

**AVACON AG
Salzgitter**



System upgrade and expansion of PSIGanesi planning system and PSIGanproda. 2003
Contracting authority was is-Energy.

**Bayerngas GmbH,
München**



Complete upgrade of PSIGamos control system incorporating the newest hardware and software versions and IEC remote coupling. 2002 - 2004

**GASAG,
Berlin**



New control system PSIControl V7 for the entire gas grid of the largest gas municipality in Europe. Integration of higher functions such as gas grid simulation (GANESI), forecast, etc. 2002 – 2003

**AVACON AG
Salzgitter**



Hardware and system upgrade of TM system. 2002 – 2003
Contracting authority was is-Energy.

**ExxonMobil Production Deutschland GmbH,
Hannover**



Upgrade of PSIGamos control system. 2002
TASE.2 coupling for exchanging process data.

**Wingas GmbH,
Kassel**



Gas data retrieval and processing with PSIGamess and integrated data retrieval. 2002

**RWE Gas AG, Kavernenspeicher Staßfurt GmbH.
Kalle, Staßfurt**

Complete upgrade of PSIControl control system incorporating newest hardware and software versions. Different enhancements.



2002

**RWE Gas AG,
Dortmund**

Complete upgrade of PSIControl control system incorporating newest hardware and software versions. Different enhancements .



2002

**AVACON AG
Salzgitter**

Delivery of PSITransport transport management system and integration in existing PSIControl. Separation of contract based load guidance.



2002

**Verbundnetz Gas AG (VNG),
Leipzig**

Delivery of PSIComCentre communication system with clear text, Edig@s and XML communication protocols.



2002

**Gasversorgung Süddeutschland GmbH (GVS),
Stuttgart**

Gas data retrieval and processing with PSIGamess and integrated data retrieval as well as automatic data retrieval in Internet.



2002

**Lukoil,
Perm (RUS)**

Leak detection and localisation system (LEO) for a product pipeline from Perm to Almetevsk. Coupled to Honeywell via OPC.



2001 – 2002

**Oberösterreichische Ferngas,
Linz**

The Oberösterreichische Ferngas (OÖF) is a regional distributor that is on the way to complete unbundling. PSITransport is used for the efficient processing of transport contracts on the gas grid operator side. In addition, storage and storage contracts are handled with PSITransport. PSITransport is used with an integrated forecast to determine sales to consumers. The existing SCADA system (not from PSI) has been linked to PSITransport. A convenient EXCEL-based nomination interface has been developed.



2001 – 2002

**Bayernoil,
Neustadt**

Leak detection and localisation system (LEO) for eight product pipelines between Vohburg and Neustadt/Donau. Coupled to a Foxboro SCADA system via OPC.



**Wingas GmbH,
Kassel**

Planning and realisation of an integrated communication system (CommCenter) for exchanging process data and business messages via TASE.2, OPC, XML and Edig@s.



2001 – 2002

**AVACON AG
Salzgitter**

Topographical network illustration and additional upgrades of the PSIGanesi planning system.



2001

**Thyssengas GmbH,
Duisburg**

Gas data retrieval and processing with PSIGamess and integrated data retrieval as well as automatic data retrieval via Internet.



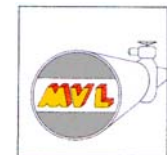
2001

**Mineralölverbundleitung GmbH (MVL),
Schwedt**

Control system PSIControl for the crude oil pipelines Drushba 1, 2 and 3, Spergau 1 and 2 and the tank farm Heinersdorf.

The system includes the complete higher functionality like automatic pipeline start-up and shut-down, leak detection and localisation, tank farm management and offline simulation.

To insure the supply of the refineries of PCK (Schwedt) and TotalFinaElf (Spergau) the actual control system has to be replaced while the pipeline is in full operation.



2000 - 2002

**Ruhrigas AG,
Essen**

Realisation of the new Dispatching Control and Information System, based on PSI-Control. Fully integrated Energy Management including Energy Optimisation.



2000 - 2003

**GASPROM,
Moskau (RUS)**

Implementation of five hierarchic control systems that monitor and control the “Blue Stream” gas pipeline which runs through the Black Sea between Russia and Turkey.



2000 – 2003

**BEB Erdgas- und Erdöl GmbH,
Hannover**

Planning and realisation of a communication server for the exchange of business messages with partners and customers. In addition, integration into the gas grid control system. TASE.2 prototype (for process data exchange).



2000 – 2002

**Gasversorgung Süddeutschland GmbH (GVS),
Stuttgart**

Migration of the main and back-up control system to Alpha hardware. Installation and implementation of new Windows NT user interface.



2000 – 2002

**Bayerngas GmbH,
München**

Gas data retrieval and processing with PSIGames and integrated data retrieval as well as automatic data retrieval via Internet.



2000

**Celanese Chemicals Europe GmbH,
Werk Ruhrchemie
Oberhausen**

Leak detection and localisation for a product pipeline certified by the German Technical Inspection authorities (TÜV).



1999 – 2000

**Rhein-Main-Rohrleitungstransportgesellschaft m.b.H. (RMR),
Köln-Godorf**

Replacement of the complete supervisory system to control the 620 km product pipeline. The new system includes the complete higher functionality like post mortem analysis and closed loop control of the pipeline.



1999 – 2002

**Messer Griesheim GmbH,
Krefeld**



Realisation of an updated control system and migration to Alpha hardware and new Windows NT user interface; integration of an Oracle data base.

1999 – 2001

**Wingas GmbH,
Kassel**



Turnkey delivery of a new gas grid control system for monitoring, controlling and optimising operations.

1999 – 2002

**Erdgas Südsachsen GmbH (ESG),
Chemnitz**



Control system PSIControl including all higher functionality for gas management.

1999 – 2000

**Hamburger Gaswerke GmbH (HeinGas),
Hamburg**



Control system PSIControl for the gas grid and the underground storages Reitbrook and Kraak.

1999 – 2000

Technische Universität Freiberg



Implementation of GANESI planning system for transient gas grid planning.

1999

**RuhrGas AG,
Essen**



Requirements specification for the new Energy Management System, based on the control system PSIControl; with complete, fully integrated higher functionality including optimisation.

1998 - 1999

**RuhrGas AG,
Essen**



Control system PSIControl for data acquisition from the gas grid and supervision and control of the complete telecontrol network.

1998 - 1999

**Stadtwerke Bochum GmbH,
Bochum**

Implementation of a new network work control system for the monitoring, control and optimisation of natural gas and water supply.



1998

**Bayerngas GmbH,
München**

Implementation of a gross calorific value tracking simulation based on GANESI for billing purposes.

bayerngas

1998

**PCK Raffinerie GmbH,
Schwedt**

Hartmann & Braun GmbH, Eschborn

Control system PSIControl for the crude oil pipeline system Rostock-Heinersdorf-Schwedt including all higher functionality (acceptance test by German officials TÜV).

Hardware: Digital AlphaServer 800 and Digital AlphaStation PWS 433.



1998 - 2000

**Snam S. p. A.,
Mailand (I)**

Delivery of a transient online gas grid simulation (GANESI) with client-server architecture, connecting to the existing control system.



1998

**BEB Erdgas- und Erdöl GmbH,
Hannover**

Implementation of a control system for the gas grid operation at two separate locations including several optimisation functions.



1998 - 2002

**BEB Erdgas- und Erdöl GmbH,
Hannover**

Realisation of a strategic planning instrument (PAN2000) for optimised cost disposition of gas purchases from internal production, external purchases and storage management.



1998

**Dansk Olie & Naturgas A/S (DONG),
Hørsholm (DK)**



Turnkey delivery of a new control system for the monitoring, control and optimised operation of the natural gas grid and crude oil pipeline. Implementation of interfaces to new telemetry system and to a leak detection system for the oil pipeline.

1998 - 2001

**Sydgas,
Malmø (S)**



Implementation of GANESI planning system for transient gas grid planning.

1998

**Energie- und Wasserversorgung AG (EWAG),
Nürnberg**



Migration of control system to computers with RISC architecture.
In addition, realisation of a new telemetry interface and implementation of an emergency control system.

1998 – 2000

**Erdgas Mittelsachsen GmbH (EGS),
Schönebeck/Elbe**



Implementation of GANESI planning system for transient gas grid planning.

1998

**Erdgasversorgungsgesellschaft mbH (EVG),
Leipzig**



Implementation of GANPRODA software for heat quantity determination for billing purposes.

1998

**Erdgasversorgungsgesellschaft mbH (EVG),
Leipzig**



Implementation of GANESI planning system for transient gas grid planning.

1998

**Berliner Gaswerke AG (GASAG),
Berlin**



Implementation of a purchase optimisation system according to the study mentioned below.
Hardware: WindowsNT based PC

1997 - 2000

**Verbundnetz Gas AG (VNG),
Leipzig**

Energy control system PSIControl for the new energy management system.
The focal point of this system is the complete higher functionality for the gas management concerning especially the quality tracking with PTB-accuracy.

Hardware: Digital AlphaServer 1000 and Digital Alphastation 500
Visualisation: fully graphical on 21"-monitors (1280x1024) with AlphaStation 500



1997 - 2000

**Thyssengas GmbH,
Duisburg**

Control system PSIControl for the new „Netz-Management-System (NMS)“.
The integrated complex „quantity and energy balancing“ supports Thyssengas with the supervision and control of the gas take.

Hardware: Digital AlphaServer 1000 and Digital Alphastation 500
Visualisation: fully graphical on 21"-monitors (280x1024) with AlphaStation 500



1997 - 1998

**Ferngas Nordbayern GmbH (FGN),
Bamberg**

Realisation of a system for uniform processing and provision of DSfG data related to meter runs as well as additional values, providing sector-specific software solutions for the gas sector. GAMESS is a system that harmonises the processing and provision of gas data from the meter runs.



1997

**Wingas GmbH,
Kassel**

Implementation of GANESI planning system for transient gas grid planning.



1997

**BEB Erdgas- und Erdöl GmbH,
Hannover**

Implementation of GANESI planning system for transient gas grid planning.



1997

**Ruhrgas AG,
Essen**

Conducting a study on the coupling of computers between the gas grid control system of Ruhrgas and its partners or customers.



1997

**Messer Griesheim GmbH,
Krefeld**



Implementation of GANESI planning system for transient gas grid planning.

1997

**VEW Energie AG,
Dortmund**



Renewal of energy control system PSIControl (INFO-G); integration of higher functionality.

1996 - 1998

Hardware: Digital AlphaServer 1000 and Digital Alphastation 500

Visualisation: fully graphical on 21"-monitors (1280x1024) with AlphaStation 500

**GAMESS-IG,
Essen, München**

Requirements specification for a trade solution to harmonise and provide gas data.

1996 - 1997

The GAMESS-IG represents the 11 biggest gas companies of Germany.

**DOW/BSL,
Böhlen**



Honeywell AG, Offenbach

Leak detection and localisation system (LEO) for the newly built system of 7 pipelines for transporting raw material (naphtha, crude oil, liquid petrol gas), products (propylene, ethylene, etc.) and hydrogen.

1996 - 1998

Hardware: Digital AlphaStation 500

Visualisation: fully graphical on 21"-monitors (1280x1024) with AlphaStation 500

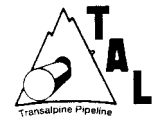
**Deutsche Transalpine Oelleitung GmbH (TAL),
München**



Realisation of a Computer Controlled Supervision of Tank Farm Ingolstadt (TALCCS).

1996 - 1998

**Deutsche Transalpine Oelleitung GmbH (TAL),
München**



Control system PSIControl for the pipeline system TAL-IG, TAL-OR and TAL-NE including all higher functionality (acceptance test by German officials TÜV)

1996

Hardware: Digital AlphaServer 1000 and Digital AlphaStation 500

Visualisation: fully graphical on 21"-monitors with AlphaStation 500

**Deutsche Transalpine Oelleitung GmbH (TAL),
München**

Realisation of a computer based operation planning for the pipeline system including the marine facility at the harbour of Trieste and the tank farms at Trieste and Ingolstadt.



1996 - 1997

**Ferngas Salzgitter GmbH (FSG),
Salzgitter**

Control system PSIControl for gas transport and distribution with all higher functionality realised as interactive load management.

Hardware: Digital AlphaServer 1000 and Digital Alphastation 500

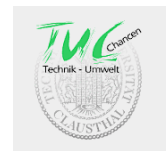
Visualisation: fully graphical on 21"-monitors (1280x1024) with Alphastations 500.



1996 – 1999

Technische Universität Clausthal

Delivery of a transient online gas grid simulation based on GANESI, connected to the existing control system.



1996

**Gasversorgung Thüringen GmbH (GVT),
Erfurt**

Delivery of a transient online gas grid simulation based on GANESI, connected to the existing control system.



1996

**OMV AG,
Wien (A)**

Turnkey delivery of a new gas grid control system for the monitoring, control and optimised operation. In addition, integrated quantity calculation of gas purchase, delivery and transport contracts.



1996 – 2000

**Berliner Gaswerke AG (GASAG),
Berlin**



Conceptional study for the short, mid and long term gas take optimisation. The aim of the study is a hybrid solution with conventional and knowledge based software. The knowledge based solution serves for integrating human experiences into software solutions:

1996

- experiences of gas grid and storage operation
- experiences of long term gas consumption
- experiences of solving optimisation tasks of combinatory character.

An important aspect of the solution is a knowledge based solution of gas take and gas supply contracts.

**Ferngas Salzgitter GmbH (FSG),
Salzgitter**



Conception, realisation and implementation of a system for technical quantity evaluation (TM) of gas purchasing contracts.

1996

VEW Energie AG/Kavernenspeicher Staßfurt GmbH



Control system PSIControl for the underground storages Kalle and Staßfurt

Hardware: Digital Alphaserver 1000 and Digital AlphaStation 400

Visualisation: fully graphical on 21"-monitors (1280x1024) with Alphastation 400

Special features: Coupling of ABB Advant Controllers via IMS stations (TCP/IP and ORACLE SQL*Connect).

Remote control via WAN from Dortmund.

1995 – 1998

**BEB Erdgas- und Erdöl GmbH,
Hannover**



Planning and installation of a data server to guarantee optimised operation of the production and transport network.

1995

**BEB Erdgas- und Erdöl GmbH,
Hannover**



Delivery of a transient gas grid simulation with exact compressor modelling, gas quality tracking, as well as adaptive forecast system.

1995

**Erdgas Südbayern (ESB),
München**



Implementation of GANESI planning system for transient gas grid planning.

1995

**Gasversorgung Süddeutschland GmbH (GVS),
Stuttgart**

Implementation of GANPRODA software for heat quantity determination for billing purposes.



1995

**Gas Union GmbH,
Frankfurt**

Implementation of GANESI planning system for transient gas grid planning.
Implementation of GANPRODA software for heat quantity determination for billing purposes.



1995

**Erdgas Ostschweiz AG (EGO),
Zürich (CH)**

Turnkey delivery of a new gas grid control system for the monitoring, control and optimised operation of the entire network. Integration of new telemetry connection and interface to various third party systems.



1995

**Gasversorgung Sachsen-Anhalt GmbH/Erdgas West-Sachsen GmbH,
Halle/Saale**

Specifying and realising the turnkey ready hardware and software system PSIControl for the telemetry control and gas grid control system.

Hardware: DIGITAL DEC AXP in LAN, Alpha Server 1000 and Alpha Station 400
Visualisation: fully graphical on 21" monitors (1280 x 1024) with Alpha Station 400
Special features: Data acquisition from substations FlowComp via dial-up modems; interface DSfG (G485)



1994 - 1996

**Ferngas Salzgitter GmbH (FSG),
Salzgitter**

Conception and implementation of GANESI planning system for transient gas grid planning.



1994

**Stadtwerke Dresden GmbH (DREWAG),
Dresden**

Creation of a gas grid control system for the monitoring, control and optimisation of the gas supply for the city of Dresden. Integration of new telemetry technology; complete realisation and start up of operation within three months.



1994

**Rhein-Main-Rohrleitungstransportgesellschaft m.b.H. (RMR),
Köln-Godorf**



Online batch tracking and leak detection and localisation (LEO) on a products pipeline.

1993 - 1994

Hardware: Twin computer system with DEC 3000-300 AXP

Visualisation: fully graphical on 19" monitors (1280x1024 Pixel)

Special features: The system runs parallel on the existing supervisory and control system yet connected within an Ethernet-LAN. Process data are transferred from the control system.

**Gaz du Sud-Ouest (GSO),
Pau (F)**



Delivery of a new control system for the control and monitoring of the gas grid in the Southwest of France (14 départements).

Additional coupling to an external emergency control room.

1993

**Gasversorgung Süddeutschland GmbH (GVS),
Stuttgart**



Realisation of a back-up system for the existing control system to secure the gas grid management. Data comparison between the control and reserve system is made on a continuous basis.

1993

**Gasversorgung Süddeutschland GmbH (GVS),
Stuttgart**



Coupling of computer systems between GVS and Ruhrgas AG for exchanging process data .

1993

**Mainova AG,
Frankfurt**



Implementation of a new control system for the monitoring and control of internal and third-party gas grids.

1993

**Stadtwerke München AG (SWM),
München**



Implementation of a gas grid control system for the monitoring, control and optimisation for supplying natural gas.

1993

Furmanite GmbH,

Markkleeberg-Gaschwitz

Hydrierwerk Zeitz GmbH, Zeitz

Leak detection and localisation (LEO) on a crude oil pipeline from Spergau to Zeitz. **1993**
The system was approved by the TÜV after an appropriate security test.

Hardware: AT 80486 with SCO UNIX

Visualisation: VGA (1024x768 pixel)

Special features: The system runs remotely from the existing system; process data are acquired from a common telecontrol system by IDS

FURMANITE

Hamburger Wasserwerke GmbH,

Hamburg

Conducting a study for a new control and automation system for the Hamburger Wasserwerke GmbH to supply water to Hamburg and its surrounding communities, as well as other distributors. **1993 - 1994**



Vereinigte Elektrizitätswerke Westfalen AG (VEW),

Dortmund

Preparation of a total application software based on hard- and software system PSI-Control for the replacement of the process computer in the power plants Emsland, Gersteinwerk, Werne and Westfalen. **1993**

Planning, delivery, installation and putting into operation of the hardware in the local, block related network and in the superior wide area network for the process information system PSIControl-K.

In each of the four power plants the block related guidance systems are connected with block overlapping networks, amongst each other, and with the particular power plant administration. At the same time the block related local networks are extended about glass fibre cable.

The connection between the local networks and the superior wide area network takes place via self-learning bridges.

The headquarters of VEW in Dortmund is connected via WAN with the concerned power plants.

Hardware: Risc-workstations, X-terminals, WAN/LAN bridges, repeater

Visualisation: fully graphical DEC 3000 AXP with 29" monitors (1600x1280 pixel)

Data quantity: about 20,000 process variables (each power plant)

Special features: Process Data Entry Systems from ABB (Westfalen, Gersteinwerk, Werne) and Siemens (Emsland) are connected via gateways for block related PSIControl-K-Systems.



Vereinigte Elektrizitätswerke Westfalen AG (VEW)

Dortmund

Extension of the existing system to the substations of the low-pressure grids.

Hardware: DEC LAN with Risk workstations Wide Area Network Router

Data quantity: upgrade to about 24,000 process variables

Special features: Connection of remote workstations via fibre WAN. Stand by service using Lap Tops. Data acquisition from substations via dial-up modem; interfaces as required by DIN 19244 and DSfG.



1993 - 1994

Erdgas-Verkaufs-Gesellschaft mbH (EGM),

Münster

Hardware and software system PSIControl for one central and three sub-central supervisory and control stations for the gas grid.

Hardware: IBM Risc-System/6000-workstations and

IBM POWERstation 220 and 340 and

IBM POWERserver 530H in a local net (LAN)

Visualisation: fully graphical on workstations (1280x1024 pixel)

Data quantity: about 37,000 process variables

Special features: WAN ring architecture with all 4 stations. Redundant routers allow dynamic load control for data transmission between WAN nodes.



ERDGAS MÜNSTER

1992 - 1994

Energie- und Wasserversorgung AG (EWAG),

Nürnberg

Conducting a study for the automation concept "Network Control System Water of EWAG".



1992 - 1994

Ferngas Salzgitter GmbH (FSG),

Salzgitter

Delivery of the gas grid-controlling system LEO-Gas for the online grid balancing.

Hardware: DEC Risk workstations DECStation 5000

Visualisation: fully graphical on workstations (1280x1024 pixel)

Special features: The system runs remotely to the existing supervisory and control system yet connected within an Ethernet-LAN. Process data are transferred from the control system.



1992 - 1993

**Gas-, Elektrizitäts- und Wasserwerke Köln AG (GEW),
Köln**

Hardware and software system (PSIControl) for a new central supervisory and control system for the grids of gas, water and heat supply.

Hardware: Digital DEC 3000-600 AXP in LAN

Visualisation: fully graphical on 29" monitors (1280x1024 pixel), four monitors per workstation

Data quantity: about 2,000 process variables

Special features: integration of the new system into the existing GEW computer systems.



1992 - 1994

**Sächsische Olefinwerke AG (SOWAG),
Böhlen**

MVL GmbH Schwedt, Gaschwitz

Leak detection and localisation (LEO) on a DN 200 Naphta conduit. The system was approved by the TÜV after an appropriate security test.

Hardware: AT 80486 with SCO UNIX

Visualisation: VGA (1024x768 pixel)

Special features: The system runs remotely to the existing supervisory and control system; process data are acquired from a common telecontrol system by IDS.



1992

**Bayerngas GmbH,
München**

Implementation of an online system for gas grid optimisation including adaptive forecast and online grid simulation based on GANESI.



1992

**Ferngas Nordbayern GmbH (FGN),
Bamberg**

Realisation of a SCADA system for the regional natural gas distributor in Northern Bavaria.



1992

**GAZNAT S. A.,
Aigle**

Turnkey delivery of a new gas grid management system, with operator interface in French, for monitoring, controlling, and optimising operation of the natural gas network. Integration of new telemetry connections and interfaces to different third-party systems. Additional installation of a remote back-up system which is connected via fibre optic cables, through Lake Geneva, to the main control center.



1992

**Messer Griesheim GmbH,
Krefeld**



Implementation of a new gas grid control system for the monitoring, control and optimisation of the nitrogen and oxygen pipelines.

1992

Implementation of a TÜV approved software system for leak detection for the pipelines.

**Verbundnetz GAS AG (VNG),
Leipzig**



Implementation of a disposition system for optimising supply of natural gas.

1992

**Erdgasversorgungsgesellschaft mbH (EVG),
Leipzig**



Implementation of gas grid control system including telemetry technology for the Hesse-Thuringia pipeline. In addition, maintenance and hotline for real-time operation and update service.

1991

**Wintershall AG (WIAG),
Kassel**



AEG AG, Frankfurt am Main

Hardware and software system PSIControl for the super ordinate central supervisory and control station for the long distance natural gas conduits MIDAL and STEGAL, as well as the underground gas storage Rehden.

1991 - 1994

Hardware: Digital Risc-workstations, DECStation 5000 and DECSytem 5000 in LAN/WAN Wide Area Network

Visualisation: fully graphical on workstations (1280x1024 pixel)

Data quantity: about 90,000 process variables

Special features: Integration of a highly sophisticated gas management system with consumption forecast, disposition, simulation and leak detection and localisation.

**GASAG,
Berlin**



Specifying and realising the turnkey ready hardware and software system (PSIControl) including telecontrol systems for a central and a distant backup supervisory and control station for the gas grid.

1991 - 1994

Hardware: DEC Risc-workstations, DECStation 5000 and DECSytem 5000 in LAN/WAN

Visualisation: fully graphical on workstations (1280x1024 pixel)

Data quantity: about 14,000 process variables

Special features: Distributed system with LAN and WAN.

Integration of X-terminals in the mosaic-type mimic display. Telecontrol systems by SAT, allowing substations by various vendors.

**Schluchseewerk AG,
Freiburg**
SIEMENS, Erlangen



Specifying and realising of the whole application software system (PSIControl) for a central supervisory and control station for the Kühmoos system control centre, five pumped-storage power stations, the 380/220 KV-switching-station and the 20 KV-station service network. Special aspects of water and energy management have to be taken into account.

1991 - 1996

Hardware: DEC with Risc-workstations, DECstation 5000 and DECsystem 5000 and VAXstation 3100 in LAN

Visualisation: fully graphical on workstations (1280x1024 pixel)

Data quantity: about 22,000 process variables

Special features: Distributed system based on workstations with the operating system UNIX and the programming language C

**AEG,
Graz**
Landesregierung Steiermark

Implementation of a visualisation system for monitoring air quality of the Steiermark.

1990 - 1991

Computer system: DIGITAL workstation in LAN and WAN with DECstation 5000

**Vereinigte Elektrizitätswerke Westfalen AG (VEW),
Dortmund**



Specifying and realising the key turn ready hardware and software system (PSIControl) for central supervision and control of the gas grid.

1989 - 1992

Hardware: Digital workstations in LAN and with Risc-workstations, DECStation 5000 and DECSYSTEM 3100 and DECSYSTEM 5400

Visualisation: fully graphical on workstations (1280x1024 pixel)

Data quantity: about 6,000 process variables

Special features: Distributed system (LAN) based on workstations with the operating system UNIX and the programming language C

**Städtische Werke Krefeld AG (SWK),
Krefeld**

AEG Frankfurt

Expansion of PSI's control system in the power, gas, water & district heating sectors. **1990 - 1991**

Computer system: AEG

**Bayer AG,
Leverkusen**

Strategic report for the Bayer Leverkusen AG water works to introduce a central control system for the drinking and industrial water networks. **1990**

**Gasversorgung Süddeutschland GmbH (GVS),
Stuttgart**

Study for the new design of control center. Planning and realisation of a system for the monitoring and control of the gas grid.



1989

**Stadtwerke Göttingen,
Göttingen**

Consulting of the communal gas distributor.

1988

**Stadtwerke Ulm,
Ulm**

AEG Frankfurt

Migration of PSI's control system to new computers, expansion of the quantity structure, and expansion of user functions. **1987 - 1988**

**Kraftwerke Mainz-Wiesbaden AG (KMW),
Mainz**

Conducting a study for implementing a new gas operation headquarters with a new telemetry network of the KMW. Drawing up tender documents, evaluating tenders, awarding contracts, supervising project up to final acceptance. **1986 - 1989**

Computer system: Landis & Gyr

Network control system: LS 2000

Telemetry technology: PCA series L&G

**Österreichische Mineralöl-Vertrieb AG (ÖMV),
Auersthal (A)**

AEG Austria, Wien (A)

Concept, realisation and putting into operation of the whole software system for supervision and control of the natural gas transport grid

Hardware: CCC 2 x 3231XP and 3205

Visualisation: DYNAVIS-A (Dr. Seufert GmbH) with PSI graphic software (fully graphical)

Data quantity: about 21,000 process variables

Special features: In addition to the extensive SCADA functions, application software includes facilities

- for planning, optimisation and simulation functions to support the dispatching,
- for installation of data links to the central computer of ÖMV at Vienna (IBM), to the national gas companies and to the international contractors,
- Band for technical and commercial gas quantity balancing.



1986 - 1989

**Rhein-Main-Rohrleitungstransportgesellschaft m.b.H. (RMR),
Köln-Godorf**

Development and installation of a software system for supervising and controlling the 650 km products pipeline of the RMR.

Hardware: 2 x CCC 3231 XP

Visualisation: DYNAVIS-A (Dr. Seufert GmbH) with PSI-Graphic software (fully graphical)

Data quantity: about 10,000 process variables

Special features: Functions for safety surveillance ("selective pump shut-down" based on freely programmable decision tables) and for product control and tracking (batch tracking, scraper tracking) were included in the SCADA-system.



1986 - 1989

**Berliner Wasserbetriebe,
Berlin-Spandau**

Implementation of complete control system for the Spandau works of the Berliner Waterworks. The works is fully automated from the energy optimisation aspect.

Computer system: DIGITAL PDP 11

Visualisation: semi-graphics

Quantity structure: approx. 10,000 data points



1988 - 1991

**SCHLESWAG AG,
Rendsburg**

Concept, realisation and starting up of the whole software system for supervision and control of the gas grid. **1986 - 1987**

Hardware: 2 x Siemens R30

Data quantity: about 2,500 process variables

**Energie- und Wasserversorgung AG (EWAG),
Nürnberg**



Implementation of control for monitoring, controlling and optimising gas transport.

Expansion and adaptation to the requirements of a complex gas grid with several pressure levels. **1986**

**Ferngas Salzgitter GmbH (FSG),
Salzgitter**



Concept, realisation and putting into operation of the whole software system for supervision and control of the gas grid. **1985**

**Bayerngas GmbH,
München**



Implementation of a control system for monitoring and controlling the gas grid. In addition, service and hotline for real-time operations and update service. **1984**

**Ferngas Salzgitter GmbH (FSG),
Salzgitter**



Implementation of complete software system for the monitoring and control of the gas grid.

Computer system: CCC 3230, 3200MPS and 3205

Visualisation: ASEA Tesselator (semi-graphics)

Quantity structure: approx. 7,000 data points

1984 - 1986

**Thomson-CSF,
St. Denis Cedex (F)**

Development and installation of a leak detection and localisation system for a 90 km products pipeline in Tunisia. **1983**

Hardware: SEMS SOLAR 16-40

**Gasunion GmbH,
Frankfurt/Main**

Concept and realisation of a prediction (GAPP) and simulation (GANESI) system for a gas grid.

Hardware: DEC PDP 11



**Gewerkschaft Brigitta und Elwerath Betriebsführungsgesellschaft (BEB),
Hannover**

Conducting a study about the ability to forecast the gas consumption of different areas in the gas transport grid of the BEB.

Hardware: FERRANTI ARGUS 700 and DEC VAX 780



1982

**Hydranten-Betriebsgesellschaft Flughafen Frankfurt,
Frankfurt/Main**

Consulting for a leak detection system for the aeroplane filling stations at the Rhein-Main-Airport in Frankfurt, West-Germany.

1981

**Zweckverband Ostholstein (ZVO),
Timmendorfer Strand**

Landis & Gyr, Frankfurt/Main

Concept and realisation of an on-line simulation system for a high pressure gas pipeline using GANESI.

1982 - 1983

Hardware: DEC PDP 11/34 and 11/44

**Hamburger Wasserwerke GmbH,
Hamburg**



Implementation of complete software system to automate all water networks in Hamburg. Works areas such as drinking water outlet are fully automated, while in other areas the operators are given the option (water exploitation, treatment etc.).

1981 - 1989

Computer system: 12 x FERRANTI ARGUS 700, 33 x Mikros Sprecher & Schuh

Visualisation: Barco semi-graphics

Quantity structure: approx. 6000 data points

**Niederrheinische Gas- und Wasserwerke GmbH,
Duisburg**

Delivery of a program package for the short-term forecast of gas and water consumption.

Hardware: DEC PDP 11



**Erdgas Verkaufs-GmbH,
Münster/Westfalen**

Carrying-out the call for tender-documents for software realisation for the inset at the decentral control stations.



**ERDGAS MÜNSTER
1980**

**Steirische Ferngas Ges.m.b.H. (STFG),
Bruck an der Mur (A)**

Landis & Gyr Ges.m.b.H., Wien (A)

Concept and realisation of the whole software system for the central supervisory control station of the gas pipeline. **1980 - 1981**

Hardware: DEC PDP 11/44

**Oberrheinische Mineralölwerke GmbH (OMW),
Karlsruhe**

Carrying-out the call for tender-documents and following evaluation of the offers for a management information system for a oil refinery plant. **1980**

**Rhein-Main-Rohrleitungstransportgesellschaft m.b.H. (RMR),
Köln-Godorf**



Consulting during planning and preparation of an inquiry for the replacement of the old supervisory control system by a modern telecommunication system. **1979 - 1981**

**SÜDPETROL AG für Erdölwirtschaft,
München**

Specification of the functional requirements for a central control station for the oil pipeline from Geneva, Italy, to Ingolstadt, West-Germany. **1979 - 1983**

Consulting and chairmanship in all negotiations with federal administration and suppliers.

**Zweckverband Ostholstein (ZVO),
Timmendorfer Strand**

Landis & Gyr, Zug (CH)

Concept and realisation of the whole software system for the central supervisory control station of the drinking-water supply, the sewage and the gas distribution system (communal supply). **1979 - 1981**

Hardware: DEC PDP 11/34

**Waterwinningsbedrijf Brabantse (WBB),
Biesbosch (NL)**

Implementation of a software system to monitor and control the waterworks with the aid of a hierarchic computer system consisting of a central double computer and two control computers. In addition, project co-ordination between user, hardware manufacturer, and electro-fitter. **1979 - 1983**

Computer system: 2 x SEMS SOLAR 16-40 and 2 x T2000/20
Quantity structure: approx. 3.500 data points

**Westfälische Ferngas AG,
Dortmund**

Landis & Gyr, Zug (CH)

Functional specification and realisation of the whole software system for the supervisory control of the gas grid. **1979 - 1981**

Installation of the energy consumption forecast program.

Hardware: 2 x DEC PDP 11/34



**Firmenkonsortium Ruhrgas AG, Ruhrkohle AG und STEAG
AEG-Telefunken AG**

Implementation of user software for a testing system for coal gasification. **1978 - 1979**

Computer system: AEG 80-20/4

**Waterwinningsbedrijf Brabantse (WBB),
Biesbosch (NL)**

Implementation of a new monitoring and control system. **1978**

**Hamburger Wasserwerke GmbH,
Hamburg**

Planning the complete automation of Hamburg's waterworks network. **1978**



**Berliner Wasserwerke,
Berlin**

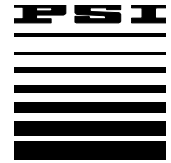
Planning the complete automation of Tegel waterworks. The functions of the waterworks include water exploitation, treatment, storage and drinking water distribution.



1977

**PSI GmbH,
Berlin**

Conducting a study for large waterworks networks to centrally monitor and control via a computer supported optimisation of water distribution systems taking energy minimisation into account.



1977

**Adria-Wien-Pipeline,
Klagenfurt (A)**

Österreichische AEG-Telefunken, Wien (A)

Functional specification and realisation of the whole software system for the supervisory control of the gas grid.

Installation of the energy consumption forecast program.

Hardware: 2 x DEC PDP 11/34



1976

**Wasserverband Kinzig,
Wächtersbach**

Frankfurter Aufbau AG, Frankfurt

Implementation of a control system for Kinzig waterworks.

1975 - 1976

**Oberösterreichische Ferngas GmbH,
Linz (A)**

Österreichische AEG-Telefunken, Wien (A)

Concept, realisation and putting into operation of the whole software system to supervise and control the natural gas distribution grid.

Hardware: Interdata 7/16



1975

**IRAQ STATE CONSULTING COMPANY OF OIL PROJECTS (SCCOP),
Rumaila (IRQ)**

Österreichische AEG-Telefunken, Wien (A)

Specifying and programming of the software system for the central network control station of the Strategic-Pipeline-Iraq (crude oil pipeline) from Haditha to Rumaila.

Hardware: 2 x Interdata 7/16

1975

**Österreichische Mineralöl-Vertrieb AG (ÖMV),
Auersthal (A)**

Österreichische AEG-Telefunken, Wien (A)

Specifying, realising and putting into operation the whole software system based on a twin computer system for supervision and control of the natural gas transport grid of the ÖMV. In a second step the twin computer system was extended to a three-computer system.

Hardware: 3 x Interdata 7/32



1973 - 1979

**Österreichische Mineralöl-Vertrieb AG (ÖMV),
Baumgarten (A)**

AEG-Österreich, Wien (A)

Programming and putting into operation the application software for a supervisory control system for measuring the gas quantity in a specially designed gas conduit.

Hardware: Interdata M70



1973

**Hamburger Wasserwerke (HWW),
Hamburg**

Evaluating offers for erecting a central control system for a pumping plant.



1973

**Genfer Wasserwerke,
Genf (CH)**

Sprecher & Schuh AG, Aarau (CH)

Conducting a study for Geneva waterworks to automate the existing plant.

1973

**Berliner Wasserwerke,
Berlin-Kladow**

AEG-Telefunken, Berlin

Conception of complete system, software realisation and implementation Berlin-Kladow waterworks.

Computer system: AEG 60-10



1972