Pipeline Control

Integrated Control System for Pipelines
The entire global economy depends on a safe and reliable supply of oil & gas.

Extracted resources must be transported over long distances.

Pipelines are the most economical way.

Pipelines are the best solution in terms of reliability of supply.

High safety against environmental pollution.
Siemens Pipeline Control
The Way of Oil & Gas

Oil
- Exploration
- Production
- Storage
- Transport
- Refinery
- Transport / Storage

Gas
- Exploration
- Production
- Storage
- Processing
- Transport
- Transport / Distribution

Scope of Siemens Pipeline Control
Pipeline operators have clear expectations of pipeline-automations systems:

- System-wide, reliable monitoring and control
- Support for the dispatcher in controlling the pipeline system
- Increased system availability
- Increased system safety
- Open for future expansions
- Integration into the existing system landscape
- Utilization of existing communications media and pathways.
- Connection to pipeline integrity management system
- Reduction in operating and maintenance costs
Requirements of Pipeline Automation Systems

- Compressor control
- Pump and valve control
- Temperature, pressure and flow-rate measurements
- Measurements of the quality of the transported media
- Powerful SCADA functionality
- Leak detection and localization
- Energy management
- Forecasting functions
- Remote configuration and maintenance (remote control)
- Open, object-oriented data model
- Open architecture
- Safety functions
- Integration of existing systems
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Typical Structure of a Pipeline Automation System
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The Complete Solution from Siemens

Characteristics:

- Use of standard components
- Scalability: from entry-level to complex pipeline system
- Pipeline object database
- Utilization of different communications media
- Support of standard protocols
- Availability of many protocols
- Redundancy capability
- Comprehensive functions for monitoring and controlling
- Remote configuration and maintenance
- Energy data management for forecasting, procurement and optimization
- Open for expanded applications
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All Information at a glance
Siemens Pipeline Control
Siemens Strong Products and Brands at all Levels

Energy Market Mgmt.
- EMM
- FDWH
- Prophet
- AMIS

Power System control centers
- Spectrum PowerCC
- SICAM 200
- SINAUT Spectrum
- Spectrum Power TG

Station control & automation
- SICAM PAS
- SICAM 1703

Communications & networking
- SAT 100
- Modems
- PLC

RTU’s
- SICAM 1703
- SICAM eRTU / miniRTU
- TG 805 / TG 5700

Protection/Power Quality / Bay Control
- SIPROTEC
- Reyrolle
- BC 1703 ACP
- AM 1703
- SIMEAS

Tools
- DIGSI
- SICAM Toolbox II
- IMM

Energy Automation
The following functions support you in the operation of your pipeline:

- Complete utilization range from local operation to a central control station
- Complete SCADA functionality
- Archiving
- Automatic log and report generation
- Web functionality
- Communications and data interchange with partners, such as other market participants
- Advanced systems management functions such as leak detection and localization
Concrete benefits for you:

- Safety and availability
- Long-term safety and economy
- Turnkey or step-by-step installation
- Uniformity
- Expert consultancy based on extensive process experience
- Autonomous, scalable functional areas
- Reduced maintenance costs through remote diagnostic functions
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References
Siemens Pipeline Control
References: Adria Vienna Pipeline (AWP)

Geographical Information

LEGEND:
TAZ = TAL Terminal Station
PS = Pump Station
RS = Pressure Control Station
AZ1 = Terminal Station Lannach
US1 = Terminal Station Schwechat
WZ01 = Maintenance Centre Klagenfurt
WZ02 = Maintenance Centre Klagenfurt
Technical Information

Type
- Crude oil pipeline from Würmlach to Schwechat

Technical Data
- Ø 18"
- Length: 420 km
- Flow rate max. 1.650 m³/h

Tasks
- Telecontrol and automation
- Communication
- Protection
- Local MMI

Data Range
- approx. 40.000 DP

Used Systems
- 69 SK 1703
- 28 AK 1703
- 1 AM 1703
- 16 MMK 220
- 59 DRS-Light
Siemens Pipeline Control
References: Adria Vienna Pipeline (AWP)

Special Features

- Integrated system:
  - protection
  - automation
  - telecontrol
  - communication

- Security redundancy

- No additional failsafe system

- Back-up communication over ISDN

- Remote maintenance system
Siemens Pipeline Control
References: Adria Vienna Pipeline (AWP)

Overview

Control Centre Würmlach
Control Centre Vendor: Pichler Engineering

Ethernet-TCP/IP

AK 1703

Radio

SATNET-LAN
SAT 250
SK 1703

TG, PS1

PS2

PS11

TS2

12 Pump Stations
2 Pressure Control Stations
2 Terminal Stations
1 Valve Station

Slide 16
Energy Automation
Details of a Pump Station

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References: Adria Vienna Pipeline (AWP)
Siemens Pipeline Control

References: Telecontrol System for OMV

Geographical Information
Technical Information

Type
- Gas Pipelines
- Gas Storage

Technical Data
- Ø 200 … 1050 mm
- Total length in Austria: 1,450 km

Tasks
- Tele control and automation
- Communication
- Back-up Control Centre
- Service & Maintenance

Data Range
- 8,000 DP

Used Systems, approx.
- 75 SK 1703
- 4 AK 1703
- 220 MK 1703
- 7 AMC 1703
- 20 PCM
- 2 DMS 120
- 58 WT 101
- 1 SAT 250 SCALA
Special Features

- Redundant communication over ISDN
- Decentralised front-ends (redundant)
- IEC 60870-5-104
- Remote Maintenance
- Coupling to station control systems (vendors: Bernecker&Rainer, Siemens, Entronic, ABB, Bopp&Reuther, Instromet) with modbus protocol
- Priorisation of station data
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References: Telecontrol System for OMV

WAG - West Austria Gas Pipeline

Control Centre Floridotower/Vienna

SAT 250 SCALA
Back-up System

Ethernet-TCP/IP

PSI

PSI

AK 1703
ZGST
Auersthal

AK 1703
Baumgarten

Enzesfeld
Kirchberg

Rapottenstein

Großgoetfritz

Rainbach
Anreit

WAG Oberkappel

ISDN

Amc 1703
Amc 1703
Amc 1703
Amc 1703
Amc 1703
SK 1703
SK 1703

Oberkappel
Kopfing
Andorf
Wippenham
Mauerkirchen
Ueberackern

Bad Leonfelden

AMC 1703
Gas storage Schönkirchen-Reyersdorf

- Front-Ends
  - PCM
  - SK 1703

- StationControl System
  - Entronic

- Modem
  - copper wire
  - 11. TH
  - 16x µK 1703

- approx. 110 gas storage wells

References: Telecontrol System for OMV
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Tasks

- Automation & HMI
- Telecontrol
- SCADA
- Data Communication
- Energy-management
- Protection
Pump stations - Compressor stations - Valve stations - Terminal stations - Gas storages

**SICAM 1703**

++ redundant configurations ++ high reliable ++ modular ++ user friendly ++ IEC61131 ++ remote management ++ scaleable +++ cutting edge-HMI ++ connectivity

++ SICAM 200 ++
Siemens Pipeline Control
Telecontrol

Gas stations – Valve stations – Gas distribution network – Frontends

**SICAM 1703**

++ flexible communication ++ redundant configurations ++ high reliable ++ modular ++ user friendly ++ IEC61131 ++ remote management ++ IEC60870-5-10x ++
Dispatching and control centers for gas transport and distribution networks

**SICAM 200**

++ redundancy ++ extremely scaleable ++
Windows&Unix ++ cutting-edge, userfriendly HMI ++
powerful SCADA functions ++ connectivity ++ web technology ++ Oracle/SQL-interface ++ TASE.2 ++
video surveillance

Additionals: leak detection, batch tracking, simulation
Oil & Gas stations and pipelines

++ Solutions for every automation and communication demand ++ network management ++ redundancy ++ integration to SCADA
Load forecast system - Resource planning system

**SAT PROPHET**

++ open architecture ++ time series manager ++ scheduler ++ modular ++ Oracle&Windows API