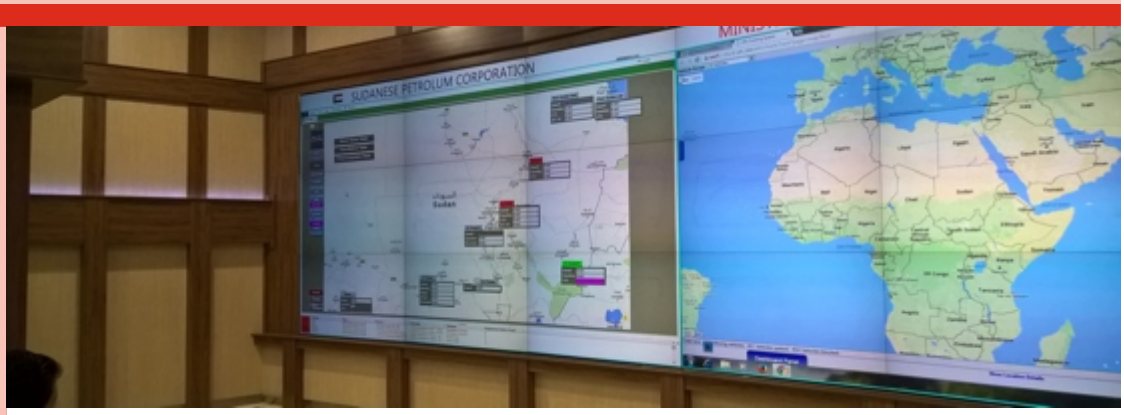
VAE CONTROLS GROUP

Hydrocarbon Management System

for Mass Balance of Crude and Oil Products within Refining and Storage

ISO 9001:2015
ISO 10006:2004
ISO 14001:2016
ISO 27001:2013
ISO 45001:2018
NATO
CONFIDENTIAL
AQAP 2110
SCC



Hydrocarbon Management System (**HMS**) is a Manufacturing Execution Systems (MES) type information system for control and enhancement of mass balance of crude and oil products. It is designated specifically for refineries and for distribution terminals to monitor volumes and quality of loaded, unloaded, processed and stored media. All product movements are evaluated, and all balances and products losses calculated. The system has added benefits to enable management to plan and monitor logistics, operations, production and tansfers effecteviely and safely, with benefits of archiving relevant data.

The system was developed with customer benefits in mind, the original concept was started from close co-operation with one oil company who specifically could not find a system that meet their needs for operation and accounting benefits that could be 'tailor made' for their business in addition being flexible, dynamically adaptable for changing needs and wants, the **HMS** met and exceeded that criteria and is a 'cost effective' step forward to improving companies business needs.

The system monitors all incomming and outgoing products including existing stocks and balances in real time for operations, accounting and logistics management. This becomes a key source of information enhancing and improving stock control, balancing, scheduling, quality control, with additional life cycle costs benefits by monitoring of equipment, service planning and many other tasks.

The live data is typically presented on large screen in control facilities and can be accessed by managers, logistic operators and other professions with approved access via personal computers. Customized reports and graphs can be tailored to suit business operations and generated at preferred intervals, and on request. The data is archived in an internal database and as need be exchanged with other information systems like for example SAP, Navision, and many others.

Individual instruments can be interfaced with **HMS** directly, for example via pulse signal, current loop or via communication interfaces, but since the existing instruments are already connected to batch control, level monitoring, SCADA, DCS and other systems, the **HMS** can be configured to estabilish connection through these systems. The system is very flexible and allows for instrument integration via different signals, protocols and formats. And in special cases, when an electronic instrument is not available, and installation of a new one is not possible or not economic, manual data entry is possible. Example: rail unloading of crude to the facility when the consignment measurement was done at the loading site, and tracable data is supplied with the delivery.

Features

- Suitable both for local and remote sites
- Unlimited number of measuring points
- Password protected access
- Process visualisation
- Configurable reports
- Open and expandable
- Data exchange across different systems
- Unique system capability for integration of obsolete or special devices

SOLUTIONS FOR OIL & GAS AND WATER INDUSTRY

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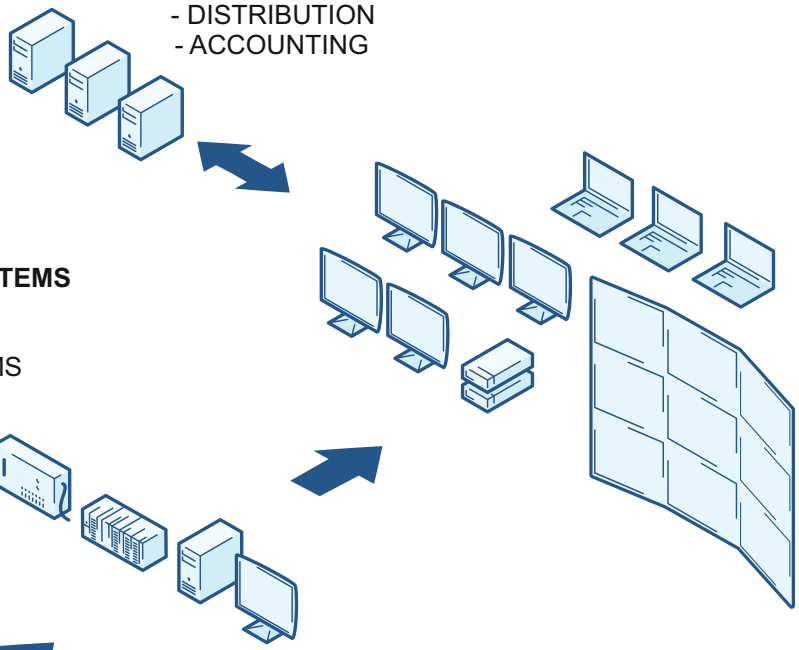
HMS allows for handling of both raw data as well as calculated data, for example: actual flow, volume, level, temperature, pressure, density, water in oil, volume at reference conditions, mass etc., and in addition utilities like electricity, water, gas, steam etc.

The software runs on a redundant Windows Server powerred by GeoSCADA system. The server provides data to operator and engineering stations using thick client technology and to the thin clients using web page technology. The licences can be fixed or floating type and their number and location is set according the customer needs. The reports are stored at the designated data server and they are accessible via standard software (pdf viewer, excel). All client access and all reports is pasword-protected in order to assure highest levels of confidentiality and secrecy.

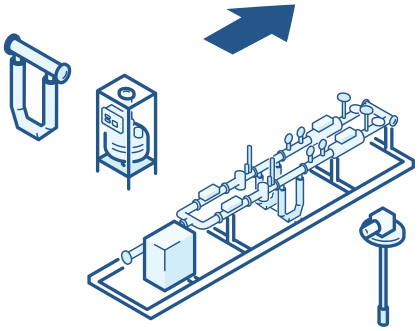
The subordinary structure of buffering systems necessary for data collection from instruments is specific for each individual project and it is subject of detailed engineering study. The following scheme shall be understood as principal only and subject to customization for each project:

ERP (ENTERPRISE RESOURCES PLANNING)
- CORPORATE PERFORMANCE AND GOVERNANCE
- CRM (CUSTOMER RELATIONSHIP MANAGEMENT)
- HRM (HUMAN RESOURCES MANAGEMENT)
- HEALTH, SAFETY, ENVIRONMENTAL
- PROCUREMENT
- PRODUCTION
- SERVICE
- SALES
- DISTRIBUTION
- ACCOUNTING



BUFFERING SYSTEMS
- RTUs
- PLCs & PACs
- SCADA SYSTEMS
- DCS SYSTEMS
- ETC.

HMS
- SERVER
- OPERATOR & ENGINEERING WORKSTATIONS
- THIN CLIENTS WORKSTATIONS/ LAPTOPS
- LARGE SCREEN



FIELD INSTRUMENTS
- FLOW METERS
- COUNTERS & FLOW COMPUTERS
- METERING SKIDS
- LACT UNITS
- LEVEL GAUGING SYSTEMS
- WEIGH BRIDGES
- ETC.

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