



**Norwegian Society of  
Chartered Engineers**

**NORTH SEA FLOW METERING WORKSHOP**

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**"Computer Concepts Data Security and Availability"**

**Lecturer:**

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**HCS**



## COMPUTER CONCEPTS DATA SECURITY AND AVAILABILITY

HCS Industrial Automation is a leading European company in design and implementation of Industrial Automation systems in all kind of industries.

State of the art solutions were found for many technical applications and problem areas.

The fast growing organization has its roots in gas and oil production automation. Many experiences are available with unmanned and demanning operating systems which have high data integrity and availability.

HCS is the first to integrate new developments and systems in their application with proven success.

Increasing requirements for accuracy, reliability and availability are handled by HCS via smart software and up to date hardware. Crossverticalisation is a keyword in the HCS organization and developments in other branches are watched carefully.

Nonstop or fault tolerant computers increase productivity and limit risks.

On line transaction processing is one of the methodes applied in other branches which might be very valuable for petrochemical industries.

On line transaction processing (OLTP) in automation originates in 1976 and then rapidly increased its markets. Banking (money transfer) cannot afford system downtimes and therefor it was this branch who initially integrated on line transaction processing as a non stop application in their system architectures.

HCS Industrial Automation built its first SCADA (supervisory control and data acquisition) system based on the Tandem non stop computers in 1981 and many have followed since then.

The success of Tandem non stop computersystems can best be shown via turnover figures. Founded end 1974 Tandem shipped its first computer in May 1976 and had revenues of 1.314.721.000 US Dollars in 1988. Also in Europe companies and industries become convinced of high system availability and reliability requirements. This is proved by increasing contribution of Europe customers in total sales.

HCS Industrial Automation has over 25 years of experience in gas and oil production automation. Over these years a software package was developed called "Fast/Tools". In Fast Tools many gas and oil orientated applications have been built to serve the oil industry. Fast Tools are hardware independant and run on several types of computers.



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The following Tools are available: Busfast, itemfast, equipmentfast, colourfast, history fast, compute fast, alarmfast, reportfast and database fast. Typical standard applications which are available: well testing, flowcalculations, leak detection, production forecast, smart production, scraper control, arrival time prediction, etc.

Fast/Tools are applied in over 200 systems all over the world.

The R&D department of HCS produces constantly new applications and developments.

Fast/Tools are available on Tandem, Vax, Vax station, Sun 480 system, Sun Sparc station, Stratus, PC and upon request on many other brands.

Complexity of gas and oil field infrastructures, combined with typical offshore requirements justify the combination of HCS experience and Tandem rigidity.

To solve the flowcomputing problems both on- and offshore, many companies designed dedicated flow computers, however basic requirements from authorities and operating companies cannot be met.

In co-operation with HITEC Stanvanger, HCS is developing a Tandem based flow computer with the following specifications:

- availability : over 99,98%
- accuracy : better then 0,001%  
Depends on the number of processors in the Tandem system e.g.
- capacity : 13 gasflow calculations and 5 oilcalculations
- frequency : every 5 sec. all calculations done
- modular extendable
- online programming and configuration
- prover loop control and supervision
- all further basic and standard functions

Above mentioned requirements were set in close co-operation with Phillips Petroleum Norway., who will be the user of the system.

The Norwegian Petroleum Directorate has to give approval to the configuration



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The nonstop configuration (sometimes called fault tolerant) consist of the following items:

- Tandem CLX 620 system
  - double processor
  - double disc
  - double I/O controller
  - double VME system
  - double power supply
  - Fast/Tools

The VME system runs under OS-9 and all programming is in 'C'.

The Tandem has its own 'Guardian' operating system and alarming options. Report facilities and displays are flexible and can be altered by client without the assistance of supplier.

In Holland HCS supplied flow computing systems for NAM (50% Shell, 50% Exxon) in Groningen (onshore) and Den Helder (offshore application).

When the Phillips flow computer system is in operation and NPD approval is received, typical items of the system will be declared standard and become available on the Norwegian market via HITEC Stavanger.

Tandem Norway provides support and service when necessary. Experience learns however that only occasionally their presence is required because the system can't fail.

Increasing demands from Governments and concession share holder force operator companies to increase functionality and availability of flow computing systems. Extentiability and modulairity cannot be missed in modern computing systems.

Do not invent wheels, find out the similar applications and use them for your particular problem.

This is the message for HCS internally and externally and you will be surprised what results it will bring.

## References

[1] Paper presented at the North Sea Flow Measurement Workshop, a workshop arranged by NFOGM & TUV-NEL

Note that this reference was not part of the original paper, but has been added subsequently to make the paper searchable in Google Scholar.