

SIEMENS

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- Check against delivery -

Ladies and Gentlemen,

I would also like to bid you a most cordial welcome to Dormagen here at Bayer which is one of the leading customers of Industrial Automation Systems – A&D AS for short – which I am representing here today. It is here at the VZ Bayer (VZB) multi-substance plant, that we came together and applied that of AS that one could wish to see in a high-tech production plant. This includes integrated automation, the Simatic PCS 7 process control system and the Batch Flexible formulation control. In addition, the MES (Manufacturing Execution System) and ERP (Enterprise Resource Planning) were integrated through Simatic IT Framework. First of all, I must express my thanks to our partners at Bayer, Dr. Krämer and Dr. Kuschnerus, who will take you round the VZB plant later on and explain the significance of MES within Bayer's operations. For A&D, VZB is a major reference in the chemical and pharmaceutical industry.

Operations control and automation – two inseparable worlds

To give you a brief idea of what A&D AS does and how we are organized, I would like to mention some of the products that will certainly ring a bell with you, which include the Simatic S7 controllers and the Simatic PCS 7 process control system. As Mr. Huber mentioned, on 1st October, we reorganized our MES activities and integrated the MES product business as a new subdivision – called “Automation Systems - MES” – into our Industrial Automation Systems division. Giorgio Cuttica is the head of this new unit which combines, among other things, the MES activities of Orsi, A&D’s former software and systems house and Compex International; he will be presenting more about this activities a little later. By bringing together manufacturing and process automation, as well as MES, we are now able to offer everything from a single source: the world’s widest range of software products for operations control and the globally acknowledged leading automation systems that make up Totally Integrated Automation. On the one hand, we are now able to better match and fine tune the increasingly merging technologies and advance them faster than before. On the other, we are able to use the worldwide product sales channels for Simatic and Totally Integrated Automation. I will be explaining a little later what this means in terms of benefits for our customers and profitability.

First, let me highlight some of the technical features and innovations in our range; then I will be describing our marketing approach and finally show you some reference plants. All this is meant to illustrate how heterogeneous and diverse our clientele and its requirements is, and how far we have advanced our technology.

Totally Integrated Automation in between high innovation speed and investment-protection for our customers

A&D’s strategy has always been to use commercially available high technologies for the benefit of our customers. This also includes Totally Integrated Automation which we first launched in Rotterdam in late 1996. With its stable interfaces, this platform system was intended to be our technical base

for at least 15 years. And this statement still holds true. By buying Siemens, our customers have the security that they can rely on the latest technology which will take them well into the future and also protects their investment.

The design of Totally Integrated Automation is based on principles which may look contradictory at first but which provide the sound foundation on which future extensions can be built – this is currently unique in the market.

In Totally Integrated Automation, the performance range includes

- innovation and compatibility – i.e. the development of new, innovative solutions whilst maintaining compatibility with installed systems.
- Modular architecture and integrated system – this means efficient use of the advantages of a modular design, which is easily adjustable to specific needs, whilst being as effective as an integrated system.
- Consistency and open architecture – this means horizontal and vertical integration in an open architecture that can be easily extended.
- Leading technology and industrial standards – this means applying new powerful technologies which are not yet established standards and to integrate existing and widely applied industrial standards such as Profibus, Ethernet, S95, .Net, XML, IEC, or OPC.

As a long established automation supplier, we need to reconcile a high innovation rate, involving ever shorter product life cycles, with a protection for our customers' investment.

The accelerated advance of microelectronics and software forces short product life cycles. This leads to a high innovation rate for automation components which continues to be around for two years. In our business, we are not dealing with consumables but long-lived capital goods which causes a certain dilemma for both the user and the manufacturer. The user wishes to protect his investment while requiring the latest automation products which usually increase productivity; both need to be well balanced and reconciled. For the manufacturer, the increasing pace

of innovation means that he has to think ahead in all his developments which are as vital to him as other factors such as time-to-market and the quality of a system. It is only if an idea can be swiftly turned into a product of excellent quality that the development costs are recovered.

Totally Integrated Automation – a fundamentally consistent and future-oriented system

This is exactly where the strength of A&D lies, namely its capability to cover this bridge between long-term thinking and time-to-market over the full range of automation technology. It is our competence to buffer the innovation rate for our customers by providing carefully selected, long-term stable hardware and software interfaces. That makes us independent in terms of innovation cycles of products, such as an operating system or a type of processor, whilst protecting our customers' investment. Moreover, it enables us to adopt newly emerging technologies and integrate them into our automation systems at low cost and quickly supply them to our customers for their added benefits.

A case in point is Totally Integrated Automation which provides easy vertical and horizontal integration of automation into workflows, based on a triple integration, i.e. single engineering design, powerful communication and consistent data management.

Horizontal integration uses the same standard hardware and software components for both primary and secondary manufacturing processes. The advantages to our customers are clear: lower cost of engineering, hardware, spares logistics, and training.

Vertical integration combines consistent communication from the MES layer to the field level, and Simatic IT Framework links the shopfloor with the existing IT environment at the customers' facilities. The main advantages include a seamless link between manufacturing and business processes; short response times to changing market requirements (i.e. time-to-market); and – thanks to a

transparent information flow – optimized warehouse logistics and supply chain management throughout the entire life cycle of the plant.

Totally Integrated Automation is open to the latest technologies thanks to stable interfaces

In the early system design phase of Totally Integrated Automation interfaces, our development and product management were farsighted enough to provide for ample easy and low-cost extensions based on a sound platform for future technologies. Since it was first launched, we have continually added to the original platform and kept the innovation rate high. You are all aware of our innovations, improvements, and extensions; let me just mention here the Simatic controllers and peripheral components, HMI (Human-Machine-Interface) systems, engineering software and the industrial communication networks, as well as catchwords such as Profibus, Industrial Ethernet and Profinet.

Ongoing innovations are also applied to our PCS 7 process control system, which we also launched in Rotterdam in 1996, and which we announce today in its release 6.0.

Primary and secondary process with Simatic PCS 7 – a truly modern DCS

PCS 7 is a key component within Totally Integrated Automation, especially for the primary processes in manufacturing plants of the process industry. Here, we have consistently advanced from a system with a limited technical data set for simple applications to today's powerful scalable solution for all process control applications.

Release 4 introduced redundant operator stations, online loadable software and Profibus communication, release 5 added fail-safe and highly available systems, integrated multi-client/server operation and Fast Ethernet communication.

Release 6.0 now makes PCS 7 a modern and powerful process control system for all applications:

Simatic PCS 7 Version 6.0 – the new, even more powerful version

Simatic PCS 7 release 6.0 is based on the hardware and software components of Totally Integrated Automation, such as the Simatic controllers and communication networks; it excels with a central, plant-wide engineering system which suits all applications. Its architecture is open, scaleable and based on standards. PCS 7 is suitable for all applications, including continuous and batch processing, and is fail-safe. With Profibus we flexibly and easily integrate transmitters, valves, and drives. Communications are consistent from Profibus PA for field applications to a powerful high-speed Industrial Ethernet control network used on the system bus or operations layer. PCS 7 provides redundancy across all system layers. One particular feature is integrated safety technology.

In PCS 7 release 6.0, we have added major features:

- Technical data sets were considerably increased – now 5,000 tags/server, up to 12 redundant operator station servers and up to 32 operator station clients. This means a considerable increase of scaleability – from the entry package with 160 process control points for minor applications to the full extension for very large systems comprising 60,000 process control points. This means that PCS 7 is available as an integrated system platform for both minor applications (on a laboratory scale, for instance) and extremely large plants, or for a combination of several plants in one location.
- In addition, the engineering system was extended. “Multi-project Engineering” makes it possible for a large project to be subdivided into several smaller technological project units which are then efficiently processed in parallel by several project managers – a major advantage that helps set up large plants effectively.

- The performance has also been enhanced by adding such features as alarm priorities and an archive system. The new high-performance archive system, based on Microsoft SQL server technology, archives about 5,000 process data per second and copes with message showers of about 15,000 messages in ten seconds. An integrated high-performance archive backup comes as a standard for exporting and backing up archives.
- Ease-of-use has been clearly improved. In order to make major technical data sets and the message volume clearer, the operator can assign message priorities in addition to the conventional classes of messages. The operator obtains additional support in the form of functions such as “loop-in alarm” and “image selection via measuring point”. By simple touch of the button, i.e. without any additional programming effort, the operator is guided to the right image of the process where he is able to work on remedying any fault or problem cause.
- Batch Flexible now provides functions according to S88, as well as hierarchical and independent formulations; it has an integrated redundancy and is suitable for major plants. To respond to the growing significance of plants that require validation, the validation function has been further enhanced in release 6.0. It now includes Version Control, Access Control, and Online Audit Trail, i.e. complete logging of any changes of formulations, or formulation operations, and any changes that are made in the course of production. Other new features include access protection, using a central plant-wide and Windows 2000-based user administration, and electronic signatures.
- An improved online editing facility and extended I/O ports add to the number of new features:

Clearly greater flexibility thanks to the extended online editing facility for all S7-400 standard controllers with related main ET 200M family of peripherals connected to Profibus DP, which is particularly useful when

adding or removing ET 200 M stations and I/O modules.

ET 200 M process peripherals and components used to convert Profibus DP to Profibus PA have been released for applications in stage 2 explosion zones. This is reflected in greater flexibility in setting up distributed I/O peripherals in the field, hence additional cost advantages to the user.

- Last, but not least, Simatic PCS 7 release 6.0 has been approved for operation under the Windows 2000 operating system.

Migration and communication: Two key success factors

There are two particular points which I would like to emphasize here, i.e. communications and our migration strategy.

Profibus/Profinet as communication backbone for the process industries

You will remember that we have been relying on Profibus, in addition to our Ethernet strategy, as an integration platform for field level communication. Starting with discrete automation, we have also come to regard Profibus as state-of-the-art technology for process engineering applications. Discussing our reference applications, I would also like to show the degree to which Profibus has penetrated process automation. We won many contracts in this area simply because Profibus ensures a stable and sound communication backbone which interlinks all the automated environments within a plant.

As market leader, we regard it our duty to support and to design open solutions such as Profibus and Profinet. Part of our strategy is to accept the standards which are currently commercially available, be they the standards of the Fieldbus Foundation, ODVA, or PNO. In a sound competitive environment, both suppliers and users worldwide should have the option to choose from equally available fieldbus/Ethernet solutions and to pick the ones that suit their

requirements best. It should also be possible to have these solutions exist side by side in plants that require more than one solution. The diversity and different highlights in the product and system identities are to be maintained with a view to productivity-driven competition for the benefit of customers.

We believe Profibus/Profinet are currently enjoying a clearly leading position in terms of technology and breadth of application as can be seen from the number of plants using these systems. A number of well-known market research firms have carried out market studies into the use of field bus technology in the process industries. We regard Profibus as the leading integration form in the most diverse applications, including the integration of distributed peripherals via Profibus DP, process engineering applications using Profibus PA, safety-related requirements using Profisafe, drive challenges using Profidrive, the integration of Hart communication and applications with specified redundancy.

And certainly the word has also spread that we are great believers in Ethernet. In 1985, long before the first fieldbuses became commercially available, we were one of the first suppliers – and since then have installed Ethernet in the automation world with currently more than 400,000 Ethernet connections. We are actively helping to shape the trend so as to open up applications for Ethernet at the field level. The Simatic S7-200 microcontroller was the first device at this year's Hanover Fair to be connected from the lower field level to the Ethernet.

Migration – both a challenge and an opportunity

For automation suppliers with tradition, it is also important to have a systematic migration strategy. As world market leaders, we are obliged to shape the transition to new technological concepts together with our customers. A major share of our new automation solutions are fed into refurbishing and upgrading existing plants.

Many plants throughout the world have been fitted with tried and tested Siemens technology which we intend, together with our customers, to upgrade

with more efficient and more productive modern automation systems. This refers mainly to Teleperm M installations by Siemens and Apacs+/Quadlog by Moore. Here we have a clear migration strategy, and we integrate these proven plant solutions through the overarching engineering system of Simatic PCS 7. In a particularly easy and low-cost proposition, we apply this powerful, cross-technological tool to migrate proven plant solutions to more modern automation concepts.

We take this proven-to-new migration seriously, as can be seen from our strategy replacing Simatic S5 by the new S7 generation. While over 90 per cent of the newly shipped central modules belong to the Simatic S7 generation, Siemens has been providing a migration strategy since 1996, from Simatic S5 to Totally Integrated Automation and Simatic S7. And the transition phase is only due to end by 30 September 2015.

Horizontal integration at the automation level has been technologically completed.

As Mr. Huber mentioned, Siemens is currently the only company worldwide to provide, in the form of Totally Integrated Automation, all sectors of industry with an integrated automation technology from inbound to outbound logistics – including a control system based on a single platform that is applied in manufacturing as well as in process or hybrid industries.

Thanks to the great advance we made with our balanced Simatic IT range of MES products for optimized workflows, we are now able to offer a well matched single-source proposition for efficient production operations. This concept gives our customers, end users and system integrators alike, as well as us, clear cost advantages over competition.

We have repeatedly emphasized the fact that Totally Integrated Automation is the only system that provides horizontal and vertical integration – from goods inwards, primary and secondary processes to goods outwards, from the field level to the ERP layer. And we have also highlighted the advantages that lie in

the combination of manufacturing aspects of goods inwards and goods outwards and secondary processes on the one hand, and the process engineering aspects dominating the primary process as such.

And what's new in the Siemens range that we are presenting here today? What's in it for the customer? Where will it be used? These are the questions I would like to answer right now.

What is new is the fact that we regard the task of horizontal integration in automation as technically resolved and completed. It has become possible thanks to Totally Integrated Automation with its many facets and breadth of applications. Naturally, not many of our customers have introduced horizontal integration across the board as yet.

Horizontal integration in a production plant will no longer occur solely on the automation layer, but more at the MES layer. Thanks to Simatic IT, we collect and combine all the automated stand-alone systems from across the plant, including goods inwards, primary and secondary processes, up to goods outwards.

Totally Integrated Automation for all sectors of industry

This is exactly what our customers require and demand. In every sector of industry, they less and less discuss the type of automation system, process control system or other technologies they wish to use. Rather, when we talk to them we find out that they are most anxious to have a system that ensures optimum operations control which enables them to flexibly produce competitive products. One of the preconditions is, of course, that the customer's production is equipped with horizontally integrated automation so that utmost benefits can be gained from MES integration.

With our unique selling proposition today, we meet exactly this customer requirement. This proposition now also enables us to penetrate into industries where we have not been so strong in the past.

Traditionally, our presence was particularly marked in industries with a major manufacturing focus. Now we are also gaining increasing acceptance in areas where process technology is clearly the dominating aspect.

As Mr. Huber mentioned, we expect to grow particularly strongly in what is called hybrid industries; they combine both manufacturing and process engineering, as e.g. is the case in the pharmaceutical, chemical, glass and food industries. Here, our single-source integrated automation and IT avoids costly technological transitions and provides the greatest benefit to increase productivity. We will be entering into these industries with our MES range which is ideally suited to manage and optimize workflows. In a second step, we will also be explaining to these customers the great advantages of integrated automation.

The fact that this is not an entirely new area for us – rather, we have covered substantial ground here - I would like, by way of conclusion, to show you some selected plants which we have implemented. You will get an idea of the wide range of possible applications of Totally Integrated Automation which meet the most diverse customer requirements, and the kind of high technology involved in fulfilling each industry's specific demands.

Examples of Totally Integrated Automation applications - from pure process engineering to hybrid applications

Example 1:

Totally Integrated Automation: „Continuous process with failsafe technology – process at the DEA refinery“

Solution: Integrated F-technology with PCS 7.

A combination of standard and fail-safe functions in a highly available and failsafe automation system

Example 2:

Totally Integrated Automation: “Example of a hybrid industry – glass”

Solution: horizontal and vertical integration

Example 3:

Totally Integrated Automation: “Example of a primary process in a brewery” and
“Secondary process in a brewery”

Solution: Integrated automation of primary and secondary processes

Example 4:

Totally Integrated Automation: “Batch process with Profibus PA - Pharma
Novartis, USA”

Solution: Communication between field devices and PCS 7, FDA compliance

Example 5:

Totally Integrated Automation for hybrid industries: “Batch process with MES
integration at Bayer VZ”

Solution: horizontal and vertical integration

At this point, I will not dwell on describing the multi-purpose plant here at Bayer.
Dr. Krämer will be giving you some first-hand information on that.

Mr. Cuttica will now be discussing the MES activities at A&D.