

History

of



*since 1860 to 1982, with an introspection on
actual manufacturing situation*

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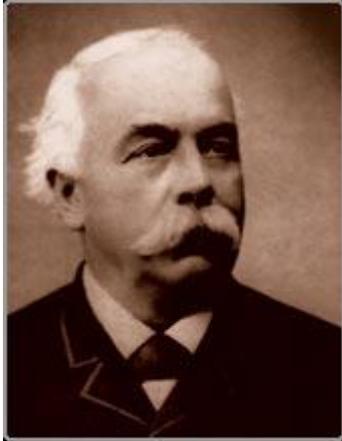
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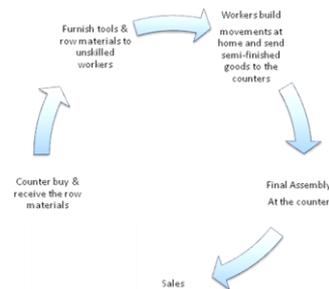
HEUER HISTORY

In 1854 Edouard Heuer, son of a shoe repairer, travelled from Brugg to the Jura mountains pursuing the quest of success and glory. At the age of 14 his goal was to learn a promising and qualified profession as he was ignorant in almost all types of job. The decision was taken; he would work in the watch industry. During four years he does an apprenticeship by a craftsman. Immediately after this experience he manages, with a bit of luck and audacity, to get hired as a watch controller by a well known company (Louis Kerner & Fils). During this time he perfects his knowhow in watch making and studies discretely the watch manufacturing processes to develop his key-competencies.



At that time, there were no industrial companies, only counters managed by its wealthy owners. Craftsmen and owners of counters have strong financial assets basis. The term of permanent employees doesn't exist at that time or the signification would not be same as nowadays. They employ few unskilled and not well paid workers at the workshop. During the winter season when farmers don't work outside at the farm in the mountains, they are temporary employed at home by the counter and get a small supplementary salary. The counter provides

them tools, raw materials, commodities and gets back deliveries of the assembled movements. The craftsmen at the workshop add the dial, tour spires, and as a final step fit altogether. The customer relationship was really strong and loyalty was the main frame of their business. We are still far away from a JiT model and inventory management...



Two years later in 1860 Edouard had revolutionary ideas and founded his own counter in St-Imier. Influenced by his previous boss he copied and structured his counter with the same model as described above. During four years the counter produces with his winter season's workers mainly silver pocket watches and also gold ones. Surprisingly Edouard has already in mind a futurist vision and a strong feeling that it was possible to industrialize the watch making processes and by the same time develop innovative watch systems.

In 1864 he founded his first company, which was labelled "E. Heuer & Compagnie" in Brugg, near the city of Biel/Bienne. The first innovation that came out of the workshop was a little revolution in itself. All the pocket watches produced before were beautiful but quite uneasy to wind up. Customers had to open the watch, remove the front glass, wind it up with help of a small key and finally reassemble it all together. Even if customers were used to this, this system took a lot of time and the operation had to be done quite often. Edouard thought that a new generation of modern customers would be pleased to wind a watch up only by rolling a crown winder and hoped that the company would really take off with this innovative idea. Unluckily at the same time as the first models came out of the factory and were distributed in Europe in 1866, a war emerges between the Austrian and the Prussian empires. During this European tense period the company sales were far below the forecasted numbers and the financial situation was really critical.

With optimism and certainty to be on the right track, Edouard moved the company to Bienne and with his technicians' competencies redesigns winder systems. Finally in late 1869 and beginning 1870 he obtains several patents in France and Italy covering a new independent crown winder system. Switzerland had not yet laws concerning the protection of intellectual property.

This system provided revolutionary advantages for Heuer company due to the fact that watches were easily repaired without disassembling the moving parts of the movement. Without this innovative idea, no industrialization would have been possible. The process of repairing watches was incredibly quicker, reliable and parts of movement suffered considerably less of wear. The movement was accessible from behind which hasn't change up to today.

It is only in 1873 at the universal exposition in Vienna that the first public success can be noticed. His innovative system is appreciated by a new kind of customers and the notoriety he always dreamed of was finally there. The following years the key competencies of the company's engineers promote a industrial production of smart pocket watches but leading to enormous high valuable finished goods inventories. In fact, Edouard has no distribution network capable of facing the production flow. After several personal sales tries in England his optimistic view of the British market had to be reconsidered. The public is still quite conservative to the new offered technology even if Swiss watches were known to offer better reliability. Furthermore, bad news for the Swiss watch industry came from the United States. An unknown company in Europe named "American Watch Company" based in Waltham announced that they could produce more than 2,200 gold and silver watches and some other movements in 6 days of 10 hours work. It came clear that the leader in American watch industry would take the biggest world wide market share with its 250,000 watches production per annum. Even

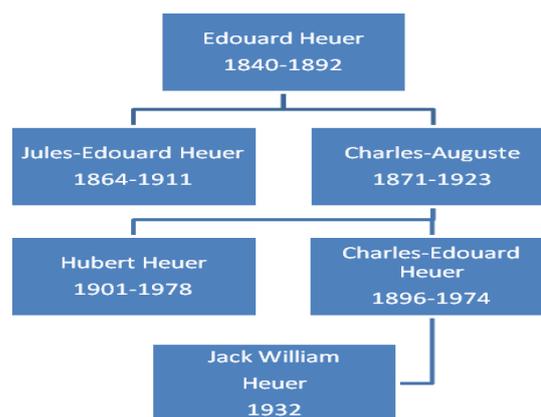


professional support and repair was provided by the company. Edouard understood that time of craftsmen was over and that he was unable to compete on the US market. His personal conviction is to react with higher quality products and diversification of activities he pursued. Fresh capital was absolutely necessary to restructure the Heuer company. In association with Fritz Lambelet, expert in diamond trade, he founded a division that produced luxury and high quality mechanical watches. Rubies were necessary to enlarge lifetime of a movement by improving the reduction of wear and tear. In order to provide enough cash to create this new division, they opened a trade office for diamonds.

Heuer travelled through Europe to sell his watches with success but is again confronted to the problem of the British market. They had already bad experiences in London, but noticed that a new market was emerging, the sport timing. In 1882 Heuer introduced the first stop watch in his catalogue. The next ten following years, Edouard Heuer patented his new innovative (especially stop watches) ideas in USA, introduced marketing concepts such as naming and signing the watch models and developed the trade office of luxury rubies. In 1892, aged of 52 years Edouard Heuer died and bequeathed to his family a fortune of 552,750 old Swiss francs. A dynasty of entrepreneurs was born.

A drama occurred in Heuer's family in 1887. His daughter Louise did not survive a stupid in-house accident. Before his death Edouard had placed his oldest son Jules-Edouard at the head of the company. Few years later Charles-Auguste joined Jules-Edouard and took mainly in charge the innovation department. The brothers bought a major innovation and patented it; a waterproof watchcase. They understood the big market opportunity they got, because the first modern Olympic Games were taking place the year after and they wanted already to become the leader in this future segment of the market.

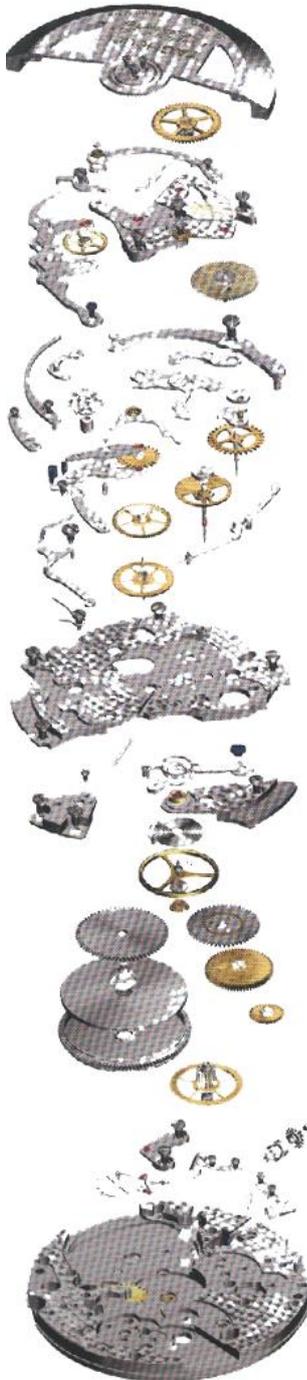
Business went really well until a new technology improvement; the discovery of the synthetic ruby changed completely the market horizon. Rubies were used in the movements because they reduced the wear if the mechanical moving parts. Its consequences were catastrophic for the watch industry. In Heuer's company the rubies trade office suffered and finally disappeared.



These difficulties to face introduced necessary and interesting improvements in human resources management. The company needed again restructuration and edited a new set of working rules. They noticed a particular important absenteeism problem (which apparently was well known in the professional sector). The new severe convention regulated strongly the working environment. Ten hours work per day was imposed and a surprising anecdote described in one of the article was "Alcoholic beverages and absenteeism at your working place is formerly prohibited". The working day

started at 7am to 12 o'clock and 1.30pm to 6pm. The unique human resources reinforcement was enough to let the business turnover meet positive growth.

The American watch market hasn't been significantly explored by their dead father because of the bad experiences Edouard had in the United Kingdom. In 1900's Heuer company associated itself with an authentic retailer named "Henry Freund & Bros., Wholesale Distributors Diamonds Watches, Jewellery". Henry brought the Swiss company essential marketing competencies and sold the Heuer's watches under the Henry's jewellery trademark "The Rose" which was an enormous success. American customs imposed that watch manufacturers had to add their stamp of the company on each imported goods, which forced the brothers to run the risk of renaming "E. Heuer & Compagnie" in "E. Heuer & Co, Rose Watch & Co."



After the death of Jules-Edouard Charles-Auguste was ruling alone the company. C.-A. showed new competencies and the will of modernizing the factory. He wrote down in 1912 SOP's, standard operating procedures of the watch production process. After that he went on reorganizing the purchasing operations putting in balance the costs of raw materials, movements with the effective production of assembled stop watches, wrist watches, etc. The new philosophy is focused on the growth of profitability and the assertion of the Heuer brand. Improvements are made in the communication with end-use customers or suppliers; they wanted to distinguish from the others by creating logo, slogans; be a modern company.

Convinced that the comprehension of the American market was an essential key aspect in order to compete; his son Charles-Edouard experienced the American Business in New York by Henry Freund. The company did not suffer during the WWI. At the end of the war, they encountered their first case of counterfeit. German companies enrolled Swiss representatives to sell Made in Germany products in USA and some of them added the name of "Heuer" on their fakes or bad quality watches. Despite the hoax was proved, American customs introduced severe limitations on the volume of Heuer's watches importations. An anecdote reported that Charles-Edouard, his son, wrote to one of his friend in New-York and asked him to find an importer capable of influencing any acquaintances in the famous Giant's team. This marketing trick functioned and US customs limitations were overcome. But the Charles-Edouard had understood that Americans are easy influenced people, but on the other hand non predictable customers. The production layout or organization in Bienne was not ready to face changing demand.

In 1923 Charles-Auguste died and again the two sons shoulder the responsibility to maintain the firm.

Charles-Edouard and Hubert both went to USA to specialize themselves. They were convinced that if the brand was well known in the United States, Swiss citizens would buy them and expand the national market. But funnily they had business relationships with the USSR. The Soviets were non reliable customers but ordered important batches of precise stop watches for their industries.

The crash of November 1929 at NYSE erased all kind of growth's hope. During the following years severe losses are painfully recorded and the company tried everything to stay afloat. Hubert's wife injected fresh capital which gave them something to survive. In 1939 the company is back on the market due to incredible marketing and innovative efforts. Due to the death of their American importers, the brothers chose Aisenstein a powerful distributor and sells took the lift. During WWII Germans ruled the business relationships between Switzerland and USA. Considering the difficulties to

export to their better customer, the brothers promoted their production on the national market and noticed an interesting marketing fact: customers buy more certain models of watch where there is a

logo on the case box, movement and dial. At the end of WWII they extended this custom and created indirectly the notion of brand ambassador. The prince William of Sweden and Harry S. Truman were the first and famous personalities to wear a distinctive brand watch. They understood the concept of notoriety really well and entered the USSR market thanks to an apparition of a Heuer stop watch in a soviet war movie. Heuer were good marketer. In early 1951 they entered the Japanese market and wanted to build their 4th most important market. In late 50's they sold the family house to gain in capital and Hubert and Jack William established their own distribution network in USA, "Heuer Time Corporation".

At the age of 26 Jack William earned an engineering diploma at the ETH. By doing an apprenticeship in Abercrombie & Fitch, USA, Jack was well aware about the weaknesses of the company: the competitors. In the 50's it is also the arrival of digital watch, or stop watches based on quartz transistor system which provided the 1/100th precision. Heuer and Leonidas merged together in 1964 to take 40% of the market share in the USA.

Later Jack introduced production lines management for a model of mechanical wrist watch with Quality Control based on the first computers (perforated cards). Besides he intended to raise employees' motivation in the production department and ordered several psychological studies. In 1966 a subsidiary is founded in Stamford, Connecticut for R&D in micro timing research fields. In 1970 Hubert and Charles-Edouard retired.

At that time electronic watches were placing the traditional watches industry in a bad position. A necessary augmentation of capital was made for investments in promotion (sport sponsoring such as F1) and sells. Heuer made several innovative digital stop watches series but the general economical context (Vietnam War, inflation, oil crisis, the weakness of the US dollar) put the company in a severe situation. Even if Heuer was the world wide leader in sport watches, stop watches and chronographs; The Republic of China ruined definitively the company.

In fact in 1981 they ordered a huge quantity of sport stop watches. Heuer had difficulties to get raw materials due to the tense climax and decided to order a large quantity of blank movements in order to have the certainty to fulfil the contract. China closed its customs to the importation of Swiss watches and moreover the strength of the Swiss franc leads to delays in payment from foreign customers who wait that the Swiss Franc went down... Without any cash, the company "Heuer-Leonidas SA" went bankrupt. Game over. It was the end of the familial company.

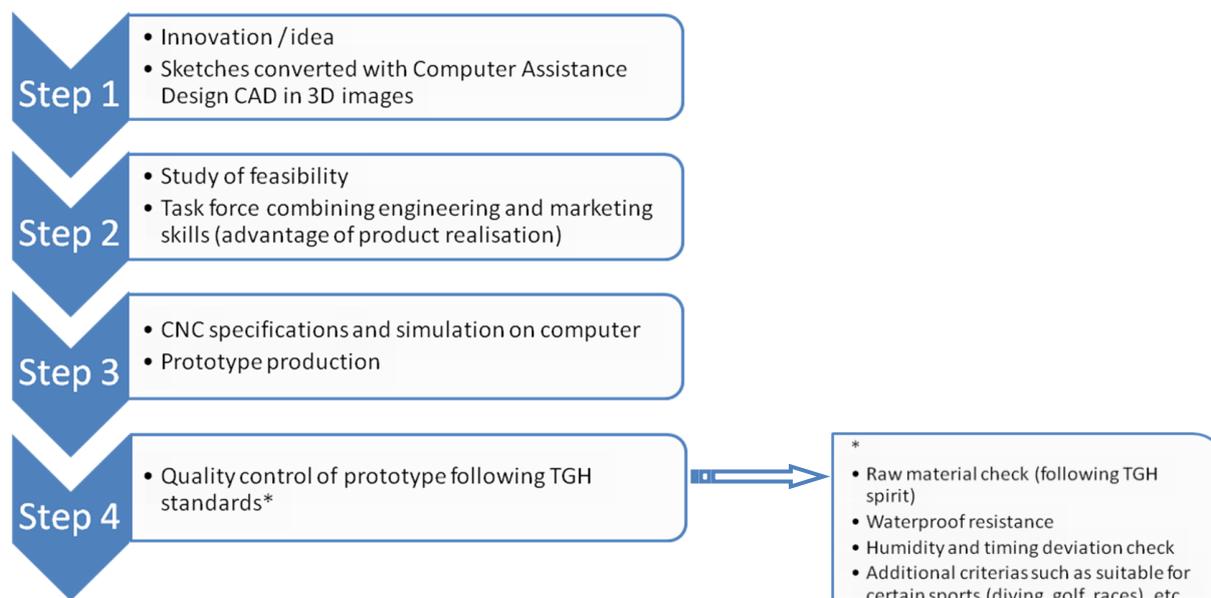
TODAY'S MANUFACTURING SITUATION

TAG Heuer has two different main processes:

1. Prototype development
2. Assembly

Prototype development

The standard structure of the watch development is described as below:



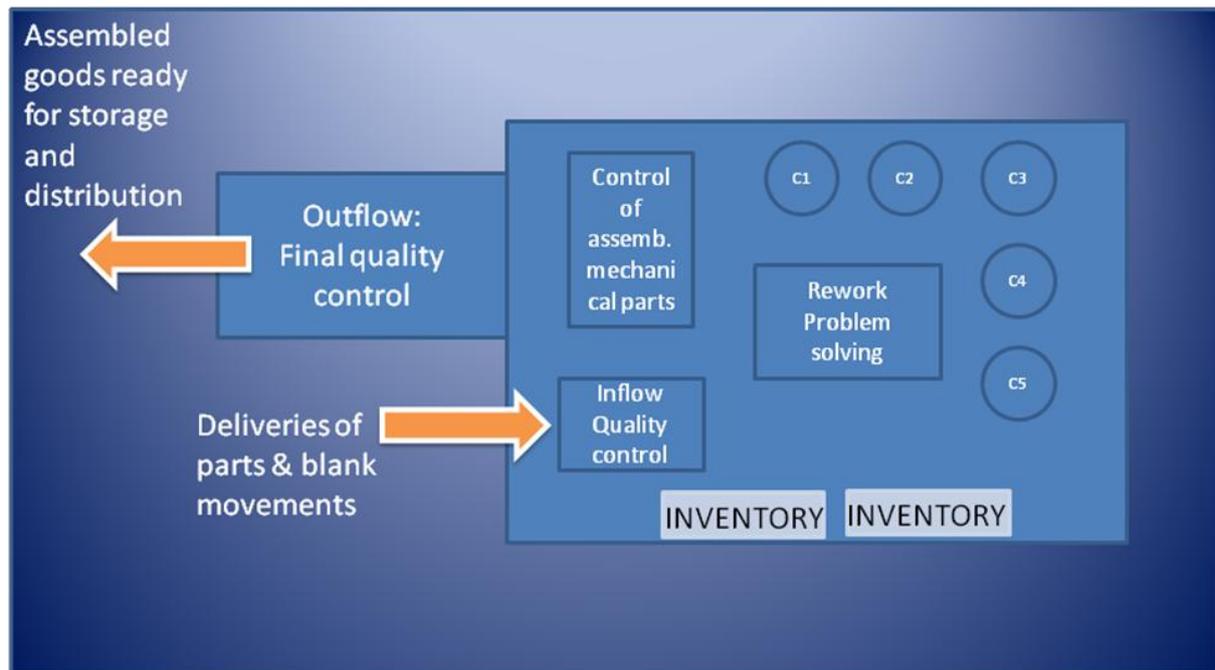
After innovation, the main focus in development process is devoted on quality management. Two categories of tests are conducted; mechanical and chemical testing. When the prototype showed its capacity to resist to extreme environmental conditions and multiplied shocks, the results of the analyses of tests, the drawing along and certified test blocks are sent to third-party partners or suppliers. Statistical Procedure Control is now defined and will cover more than the manufacturing process only. In fact, ongoing tests are driven along the assembly process.

Once the prototype is certified and reaches the TGH standards, the production can be settled and launched. However, only special watches such as the "V4" or limited edition series go through this process, which is designed for watches with original and non standard blank movements (some series need to be reengineered such as blank movements or calibres from ETA). More generally we can say that TGH manufactures in-house or by his subsidiaries only dials and cases. One of its subsidiaries based in Cornol (Switzerland) produces all the watch cases. The process is called "stamping" method, which implies hydraulic presses of 150-200 tones of pressure. Even tools used in the process are designed and manufactured in-house. The opposite strategy as Rolex does; everything is done in-house.

Assembly

TGH receives parts and blank movements from suppliers and own subsidiaries of Switzerland and overseas. All different parts find their way to La Chaux-de-Fonds for assembly. The layout of the assembly department is shown below:

Assembly layout



In each cell, skilled workers assemble one watch after the other from A to Z. The main reason of this choice is explained by the fact that motivation has significantly increased and each group can choose its method or way of doing the assigned job. The job orders and cell's objectives are known in the beginning of the week. Each unit receives a rigorous and specified checklist similar as a standard operation procedure for each batch of specific model. Doing so, a constructive and positive competitiveness can be established. Furthermore, workers haven't fixed hours of work. Flexibility is the work frame and work absenteeism isn't a problem, potentially, the assembly can never stop. It is also easy to introduce ongoing quality control between each unit and merging expertise cooperation. A cell of high skilled technicians is devoted on specific rework and cell's assistance or support in complex assembly problems. The closeness in the cell provides interactivity between workers and promotes new ideas or improvements. Besides, watch industry has to face a global problem: the loss of work expertise in watch making. Today many companies have to employ or maintain retired workers.

Considering these entire parameters GT layout should probably be the most suitable organization plan. The assembly process may be really efficient but the system of orders management is quite debatable. Indeed, marketing departments of world wide subsidiaries plan monthly forecasts for each line of goods. This way of demand estimation brings to really high out-inventories and a large amount of immobilized current assets. We find strange that the company just forgot the breakdown they had experienced in 1982. Maybe the economical conjuncture was different, but the problem scheme was quite the same; high in-inventory, sudden break of demand which conducted to bankruptcy.

Group Technology Layout

Cellular Manufacturing's fame has grown thanks to the adoption of the TPS (Toyota Production System or Lean Manufacturing). TPS's fathers, Taiichi Ohno and Shigeo Shingo have described rules which were working or not; sadly without a strong theoretical basis... TPS had several restrictions and the cell manufacturing evolution brought GT.

GT improves manufacturing in other ways. The catalogue of parts is reduced and it's easier to improve a more consistent process planning. A computerized tool named CAPP (Computer Aided Process Planning) can optimize your manufacturing process design easily. "It uses the coded similarities to plan consistently, standardize and accurately estimate costs. It then assigns the part to a GT manufacturing cell", http://www.strategosinc.com/group_technology.htm. Furthermore, GT cells reduce throughput time and WIP. Due to the reasons mentioned above, manufacturing cells simplify schedules, reduce goods shifts and control is increased.

Setups improvements contribute the most to savings. Indeed, the reduction of setup time has several positive consequences; it reduce tooling costs, which can be really high for some manufacturing companies, bring smaller lot size and finally smaller queues which means faster throughput, shorter lead times and decreased in-inventory.

FUTURE OF MANUFACTURING

TGH is in a good shape and faces competition quite easily today. The manufacturing processes evolved from production line to group technology, how will it be tomorrow? In the future we think that TGH will have difficulty to shorten even more the lead times or reduce its inventory levels even lower at the assembly unit. Optimization has already been done. However, a further step in the manufacturing chain could be to convince or force the suppliers to storage their outputs and deliver daily to the assembly department. This would not be too hard to implement due to the already geographic closeness of the high valuable parts suppliers or subsidiaries; a daily delivery could already be possible today.

A spectrum of investigation can be the estimation of demand and market size prognoses. Why not create high specialized and luxury watches that require a queuing system for demand? TGH already started to produce a limited line of SLR models (200) only available with the purchase of Mercedes SLR car. A model to follow could be the Patek Philippe Caliber 89 way of production. Only 5 watches are done per year with orders planed for the next 40 years.

Based on our course we could suppose that if TGH cannot position itself as a very specialized watch maker, and even then, they should try to reduce their inventory. Reducing inventory size is one of the best ways to gain speed in Operations Management, and therefore be competitive on the long run. This speed which proves invaluable in differentiating itself from its competitor, help gains a competitive edge in a successful production by allowing, faster reaction.

For now this practices should prove to give enough advantages, but we have to remember that Operations Management is always evolving with technologies and we have to be careful not to miss the next revolution. Even better, perhaps we could try to invent it ourselves by always reconsidering our practices in face of new innovations.

SOURCES

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Personal interview with Miss Sophie Raehse, Marketing assistant at TAG Heuer SA, Switzerland

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Pictures were scanned from the different books of TAG HEUER, except:

- the logo is downloaded from <http://www.tagheuer.com>
- the rear view of the open calibre comes from:
http://www.onthedash.com/Guide/_Chronographs/1920.Transitional_Chronographs/a.Transitional_Chronograph/

Graphs are done by the authors.

Lausanne, the 31st of January 2007.