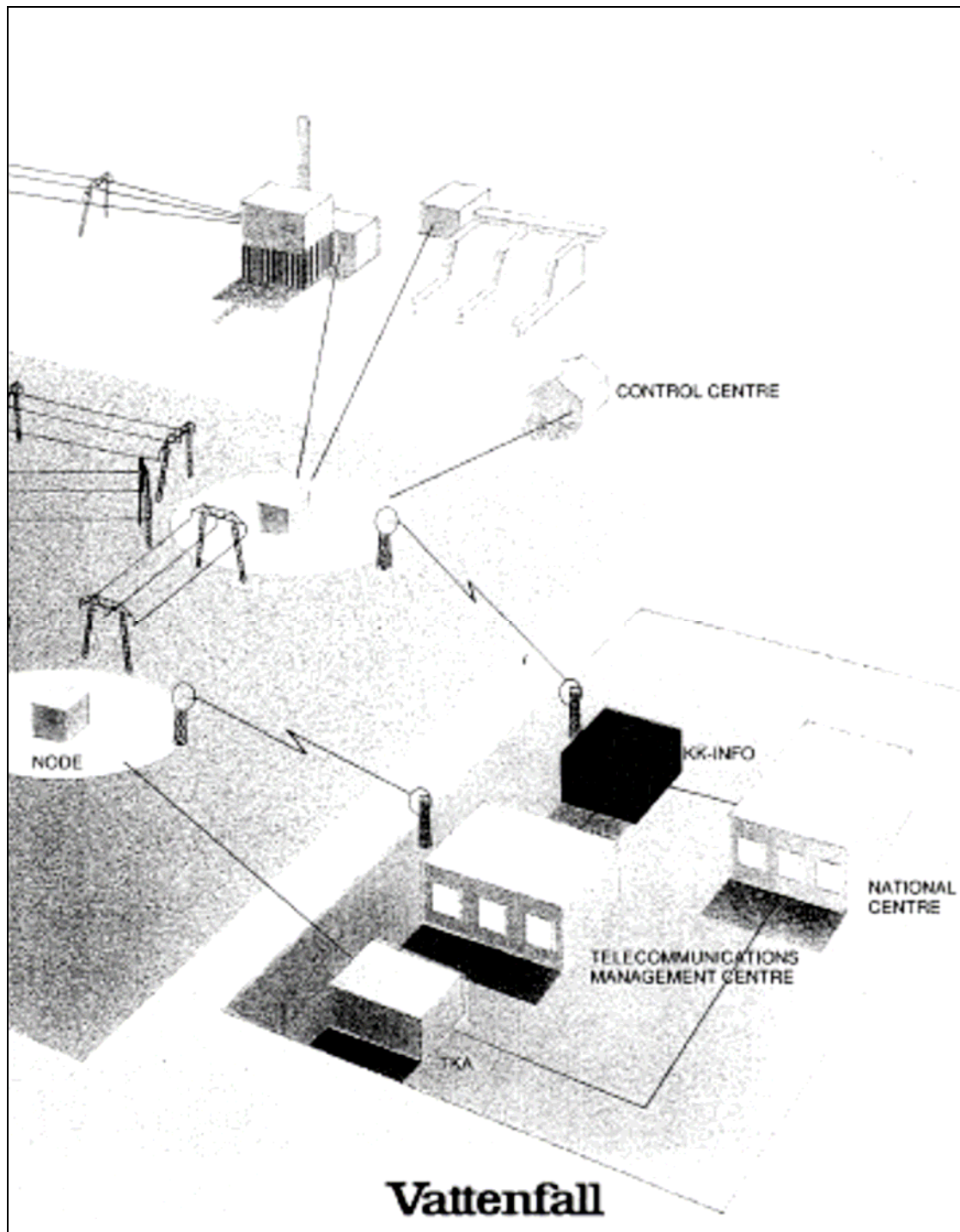


TIDAS - the birth of techIT at Vattenfall



Preface

Wham, hurricane Katrina slams into Louisiana and my mailbox starts beeping. It is 2005 and I am supposed to chair a joint Cigré/IEEE session on Information Technology in New Orleans October 5-7. Worried mails from our international speakers, what's happening? Will we have a conference? Gee, give me a break; I'm on another continent too. Reassuring e-mails arrive from the organizing committee in typical North-American style. We will support New Orleans. The last thing they need right now is that their business goes away. Eventually Joe Weiss, our speaker on Cyber Security calls from California. This is really bad Erik, don't expect a conference in New Orleans. The organizing committee makes a heroic effort and manages a last minute move of the conference to San Antonio. I re-booked my flight to Houston Texas; barely avoid a second hurricane that forced an evacuation of eastern Houston. Everything worked OK and I got the opportunity to visit Dick Kay in his home before going on to San Antonio.

Dick Kay was the integrator at TRW Controls back in 1975 and the person who eventually made the TIDAS system work. We became personal friends and it was great fun to see him again. Old memories came alive over a Texas beer and when Vattenfall's manager for Group Function strategies Lennart Billfalk asked me to summarize my memories from the TIDAS project for the 30-year anniversary in 2007 I was ready. In many ways I see the TIDAS project as the birth of technical IT at Vattenfall. Here is the short story about people and events in the TIDAS project.

Happy reading.

Erik

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The TIDAS project for a Totally Integrated Data System called KK-INFO

TIDAS Sweden's first digital national control centre was put into operation on the 7th of February 1977 at 07.00 CET. I am still proud over the precision in 07.00. No fussing around with gradual commissioning but a precise start at a distinct time exactly in the spirit of Lars Gustavsson.

The decisiveness of Lasse or 'toe-less Slim' as we fondly called him was one of the key success factors for TIDAS. Lasse was head of operation control (DK). He later became the head of BU Nuclear Power and eventually of BU Production & Transmission. For us in the TIDAS group however he would always be 'toeless Slim', the man who shot faster than anyone could draw a gun. 'Remember to start by giving Lasse your best alternative' said Gunnar Ålfors, one of Lasse's hardened young engineers responsible for production planning. He later took over as head of DK (now PD). The tradition at SSPB (Swedish State Power Board), as we were called abroad, was otherwise to present three alternatives; first H1, which nobody wanted but showed that you had understood the issues; then H2, which you recommended, and last H3, which was so expensive that H2 seemed reasonable. Lasse took a number of H1 decisions, as he just couldn't wait for the presentation to finish.

TIDAS

Totally Integrated **Data** System for

Produktion planing;

- Power balance prod./consumption.
- Weekly production plans
- Reserves for disturbances

Network calc 7 times/min;

- Line loads
- Transformer loads
- Breaker status

Analysis and calculation;

- Analysis of 850 indications & 750 measured values every 8:sec.
- Improving measurements and estimating blind spots.
- Simulating proposed switching.

The tactical expert on DK however was the middle manager John Lindqvist. John came from the county of Varmland and his humour had many similarities to that of Sweden's late Prime Minister Tage Erlander. John, who knew that Lasse demanded deliveries on time, had managed to smuggle 12 months reserve time into the project plan. When we, aggressive young engineers kept the vendor honest by refusing to accept the system quality during FAT, John took all the political heat in Stockholm. We probably gave him many sleepless nights. However we on our side had understood that shipping a system was the only thing that counted for TRW management. To have a late shipment in the factory in full view of all potential new customers was driving effort and extra resources in a way no threats of contractual penalties could. We stubbornly kept the system in Houston while one FAT failed after the other.

In the end TRW flew in Dick Hustfedt, the chief engineer from Xerox, our subcontractor for the computer and operating system CPV. Dick was in a hurry. He told us as he was leaving the company to go to Boston and start the first combined hardware/operating system design in the world. Dick Hustfedt was an impressive software designer and fixed all stability problems within the week. Together with Dave Cutler and Peter Lippman he then led the development of Digital Equipment's (DECs) VAX/ VMS system. Through Dick we later got more non-disclosure information about VAX than anybody in Sweden thought possible. VAX became the platform for the following regional control centre project REKO-T and the standard platform for all of Vattenfall's minicomputer installations. Decnet was the start of VattNet.

TIDAS RESULT

Investments & profits

- Investment: 8 millioner €
- Profit: 1% of production in the Lule river

Operation

- Start: 1977-02-07 at 07.00
- Statistics first 6 months
 - * Availability 99,46 %
 - * 90 % failures under 5 min
 - * Failover 15 seconds.
- Shut down /Vattenfall: Sept. 2000
- Shut down SvK: Sept. 2001

If TIDAS was a success story for Vattenfall it was never the smooth ride many thought. There were times we thought it would fail. However Vattenfall had recruited an excellent mixture of knowledge for the group in Houston, including some of the best people I have worked with. My personal contributions came from a long cooperation with IBM and a deep knowledge of the internal workings of computers and systems software. I came directly from working for Percy Barnevik at SANDVIK steel factory to Houston. Percy who was impressive even in his thirties, was smart and very decision oriented. He was not 40 years old when he became the CEO of ASEA and later ABB. Percy never forgot his 'steel-men' and it was a surprise to sales people in ABB that I actually had a direct link to their CEO. Other TIDAS colleagues had backgrounds from tele-/datacom, database design and power system applications. Our various experiences triggered lively discussions and conflicts were sometimes high. Without Lasse Wiklund, our extremely calm project leader who commuted between Stockholm and Houston, the group may well have exploded in internal conflicts. Lasse initiated regular group meetings at the pool house in the community we lived. In this tranquilly environment we exchanged critical information and solved potential conflicts. Bengt Bergstedt was another of the socially gifted group members that inspired cooperation. That he eventually made his career over chief of IT operations

to the group staff for personnel is no surprise. It was also a pleasant surprise to find Sven Börjesson in the TIDAS group. I had recruited Sven to Teleplan to work on military IT systems before I went to SANDVIK. Sven was Vattenfall's expert on usability and man/machine system technology. Better, he had international experience. In the beginning he alone understood that one single failed contractual obligation from Vattenfall would eliminate all incitements build into the penalty clauses. He had seen that before on a contract for a radar system. Our code sentence for never missing a single obligation, no matter how trivial, became 'remember the sync. signal to the PSS14 radar'. Vattenfall's delivery of data for displays soon became the most critical issue. Vattenfall had accepted an unreasonably early delivery of data, far earlier than it could be of any real value to the project. The software to read it should be ready half a year later. Vattenfall's purchase department looked upon the issue as a simple detail to correct in a contract update. Sven knew better. Peter Carlsund, who had chosen not to move to Houston for family reasons, had to set up an emergency project. A massive number of unemployed clerks were given a short-term contract and started the tedious work to find and check all data before delivery. Kent-Ove Johansson was employed as a permanent data-clerk stationed in Houston. The whole 'Houston group' had to work day and night to get everything ready. Then one night we saw lights in another part of the building and sneaked over to look. Sure enough, there were our colleges at TRW secretly coding the software to read the data, months ahead of schedule. The critical day came and both data and software were ready to the surprise of the project leaders both at Vattenfall and TRW.

Then suddenly Xerox withdrew from the computer industry. Lasse Gustavsson came to Houston to negotiate. We were all sitting at the fireplace in Lasse Wiklunds apartment the evening before discussing issues, possibilities and tactics. It was one of Lasse Gustavsson's strengths, always to check with his own crew before negotiating. Early in the morning I looked through the office window and saw a person walking alone at the parking area. 'This guy looks Swedish' I commented. Sure it is Bengt Leander from Engineering said one of my colleagues. He is the project leader for the whole TIDAS project, we are subproject - D the control centre part. Isn't top management negotiating right now? Sure, that's important that's why he is outside. We can't stop him from coming here but he won't get into the negotiating room.

The internal management conflicts at Vattenfall those days were really something. It was a part of Bengt's greatness that he stood above these conflicts. He became a close friend and ally when we came to the TIDAS-D/T integration and was unanimously chosen as project leader for the following regional project REKO-T.

Integration became a special issue. David Lundberg, who also had a background from Teleplan and tough military communication projects, warned TRW early. However 'load TRW standard package Telcom' remained a simple action in the project plan.

TIDAS TECHNOLOGY

Highlights

- Data network Internet type.
- Dual systems for National Control
- Software maintenance on hot standby.
- Programming-free display generation
- Programming-free database maintenance
- Terminal based software maintenance

I figures

- 15 semi graphic colour monitors
- 800 working screens for dispatchers
- 700 000 data in a database of 2,3 MB
- 170 operational programs
- 120 programs for software maintenance
- 1900 files for source code & programs
- 22 nodes in data network

Over and over we argued that the large data volumes, the new compute type and the new operation system required substantial time for redesign. However you don't scare a Texas project leader easily. Time slipped by, the day to load Telcom came and John Groves approached the computer room. Johan was a smart engineer and just had to look at the computer panel to say 'this isn't going to work folk's. We told you, right? Big crisis, a new super fast front-end solution was quickly designed, the project plan found a new critical line. Urgent warnings were sent to ASEA in Västerås. ASEA's project management however was no more willing to change than that of TRW. Bengt and David were unable to convince Västerås to change their solution before integration tests actually failed. Integration became a real challenge.

ASEA had two engineers in Houston. Hans Elvén who later moved to work for Vattenfall in the REKO-T project and Ivan Öfverholm. Ivan became the software manager at ASEA after TIDAS and later the CEO of SAAB space. TRW had a big space department as well and to have a CEO who had actually lived and worked with TRW impressed young engineers at SAAB. Hans and Ivan got more information from TRW as they belonged to vendor side but soon became allied to the 'Swedish team' and close friends. Dick Kay was chosen as TRW's integrator and he eventually became the giant that made all parts work together. He was also one of the few we could share our frustration with TRW project management with. When once asking how on earth TRW managers could send up satellites his simple answer was 'because they all spoke German'. Gradually we moved from a vendor/buyer relation to a joint project tem set on a common success.

The culture chocks between Texas and Sweden could fill a book. Björn Stene, our chief application expert for production planning set the standard when he stripped into his underwear to negotiate the tropical rain running from his car to his apartment. You don't do that in Texas. Ragnar Lund, our second applications expert added to our reputation by going into the sauna without a bathing suite. You only do that in Sweden and Finland. Our visitors from ASEA (ABB) came back from Jack in the Box chocked to see cowboys with guns ready in their holsters eating hamburgers while holding on to their horses. Our visitors had no idea it was time for the yearly fashion rodeo. 'This is normal in the wild west' we lied without blushing.

TIDAS-D TESTS

Functional Spec in Contract

300 pages

Acceptance tests FAT/SAT

900 pages or 2 A4 binders

200 test procedures

active system for all tests

Test time (FAT+SAT)

2 x 12 days 2 shift (16 hours)

John Binkley, the young politician from California who had just lost an election to the congress became my mentor and teacher of US business culture. The large group of foreigners in Texas were Mexican fieldworkers. Being foreigners we were automatically classified as underdogs with little influence. John taught me how to positioning yourself in the south (west) by using Yankee slang. Use the language of the winners. To understand that the civil war still played a role in the business culture was astonishing. John became a friend for life and it was fun show Stockholm to him and his family this midsummer (2008).

Back to integration; I should mention that TIDAS-T was a success in its own right. One of the developers at ASEA was Torsten Cegrell. He later became professor at the department for Industrial Control Systems at KTH where we started the think tank for the CIO team together in 2004. ASEA was strongly influenced by ARPANET. Torsten likes to describe TIDAS-T as the world's first INTERNET. To have a data network that routed messages to any given control centre was a new idea. It avoided errors in the data links and was easier to manage. It was also an important asset when Vattenfall and Svenska Kraftnät split up the national control centre many years later. At the time of the TIDAS project however this solution was highly questioned, mainly because of the introduction of time delays between measurements. The KTH doctors developing our 'state estimator' software especially challenged it. The state estimator improved measured voltages and currents and also calculated measurements in areas where Vattenfall found it too expensive to install meters. It did so using the fact that all measurements must fit into the same electric model. Lars O Petterson, one of the young doctors, eventually got famous. Lasse P did not participate in the TIDAS project but became one of the key persons in the team that John then built as DSS. Lasse P later started the independent consulting company Sypro that both Björn and Sven joined. Lasse P had such success with various companies that he was interviewed in the largest Swedish business magazine called *Veckans affärer*. They had a fascinating article about the IT boom and this totally self-made man being one of the richest persons in Sweden. It's the only time I have heard somebody call a doctor in technology a self-made man. The reporter had asked Lasse P if he had graduated from the prestigious Stockholm School of Economics and misinterpreted the answer. No, said Lasse I come from the other side of the street, the meaning the street that separated the school of economics from the Royal Institute of Technology, KTH.

Another well-known 'near-participator' was Kurt Vedin. Kurt became chief of the TIDAS maintenance team in Stockholm and shortly after chief of AI, Vattenfall's first common IT department. AI managed the software development teams, the corporate mainframe, the national control centre and later also the central VAX minicomputer clusters and Decnet all over Sweden. The corporate IT-infrastructure that met the TIDAS team in Stockholm however was just converted from CDC to UNISYS' aging 1100 mainframe. UNISYS had taken over the personnel from Sweden's dismantled computer industry DATASAAB and was the preferred vendor for Swedish state agencies. UNISYS soon became the nightmare for the advanced IT programs used by operations. The Xerox machines were more modern and had actually larger capacity, but they were reserved for online operation. Peter and I flew over to Boston to get an update by Dick Hustfedt. Dick gave us detailed plans for the next 5 years and arranged for a later non-disclosure meeting where the immediate future could be discussed in a larger group. This information became vital both for the following regional control centre project REKO-T and the corporate mini computer survey MINUT. Corporate IT had great difficulties understanding that the technology shift from UNISYS 1100 to VAX/VMS released so much power in less expensive minicomputers. After some nightshifts converting the most demanding software and running a direct benchmark we got Kurt's OK to convert everything in operations. Or maybe we converted it all anyhow, it's a long time ago and memory can play tricks with you. However all new software for technical IT was now developed on a central VAX cluster and downloaded to local machines all over Sweden for execution.

Then suddenly Lasse Gustavsson became the top manager for all of operations. He wanted his team back so technical and administrative IT were separated again. Deregulation followed a few years later. I moved with most of the team to the Engineering group and Vattenfall Elteknik AB to become a member of the steering group of this large subsidiary. One of our big IT achievements was a fixed price contract to develop software for SvK's market operation. The project leader Christina Westman thus became the hero of Elteknik. Nils Sundberg, our deputy manager organized most of the architecture for Vattenfalls new market division. Ewa Häll's social skills sold many projects. We later formalized marketing under Helene Biström. Helene is now our deputy manager of Vattenfall Nordic and was last year mentioned as Sweden's most influential woman in Veckans affärer. In the wake of Vattenfall's failing effort, to support customers through new IT companies SENSEL and Arrowhead, key members moved on to banks and other industries. Finally leaving Engineering, now called SwedPower, we summarized our total IT profit for the subsidiary to just over 30 million SEK. Personally I joined the CIO team after discussions with the chief of Group function strategies Lennart Billfalk. Claes Wallnér joined as our CIO shortly afterwards. Vattenfall had in the same period grown to an international company with substantial operations in Denmark, Finland, Germany, Poland and Sweden. My biggest thanks to all the members in the TIT, PIM and UCN communities, who have made the slogan 'One Vattenfall' a reality for techIT.



Here is DK's Houston group 1975 outside the men's fashion store with the same name.
From the left: Bengt Bergstedt, Lars Wiklund, Sven Börjesson, Erik Sandström, Ragnar Lund, Kent-Ove Johansson, David Lundberg and Björn Stene

This English version builds on the Swedish version from 2007. Background material is stored at http://techit/OldHistory/TIDAS/TIDAS_index.doc

Early 2009 it is time for me to follow the advice of Benjamin Franklin

'It's OK to retire from you position as long as it does not interfere with your work '

/Erik Sandström