

FORSØK PÅGÅR

HALON UTLOST

INNESTENGT
PERSONALARM

Professor Olav T. Onsager photographed in SINTEF's and NTNU's high-pressure laboratory. The laboratory was an important tool in the work of developing a new process for the manufacture of methanol.





Jann H. Langseth, former Research Director and Special Adviser, SINTEF

SINTEF turns 60 – personal reflections

SINTEF came into being as a result of the provocation of professors in Trondheim. In sixty years the company has developed from a modest consultancy organisation for the Norwegian Institute of Technology into an internationally-recognised research institute.

Since SINTEF's history was described in great detail in connection with our fiftieth anniversary, this will not be another review, but simply some reflections from a person who has had various roles in the organisation during the last forty years.

Following the Second World War, research councils and institutes were founded in many countries. The origin of this development lies in a question which Franklin D. Roosevelt, the US President at the time, asked of his scientific adviser, Vannevar Bush: "What can the Government do now and in the future to aid research activities by public and private organizations?" The response appeared in the form of the report "Science – The Endless Frontier", published in 1945, in which Bush postulated the responsibility of the government to develop new expertise and sketched a system of research councils to manage the necessary public funding. The development of new expertise was viewed as the prerequisite for increased prosperity and a better standard of living.

The foundation of NTNf

In Norway, a committee for the organisation of technical research was appointed in September 1945. There was a distinct sense of urgency, and the conclusion was clear: "The war has demonstrated more clearly than ever that organised technical research is crucial to the industrial exploitation of the pure sciences and thereby to victory in technology-based warfare. However, it will inevitably be equally decisive in the peacetime contest which is now approach-

ing. Those who are not able to compete will automatically sink into economic dependence." With this sombre warning in mind, the Norwegian parliament passed a resolution to found the Royal Norwegian Council for Scientific and Industrial Research (Norges Teknisk-Naturvitenskapelige Forskningsråd – NTNf) in 1946.

Reaction from Trondheim

NTNF quickly set to work with the planning of research institutes. Plans for the foundation of the Central Institute for Industrial Research (Sentralinstituttet for industriell forskning – SI) in Oslo emerged in 1949, and the reaction from the Norwegian Institute of Technology (NTH) in Trondheim was not slow in coming. "The Institute's vital interests are being jeopardised," claimed the Rector of the time, and work commenced on NTH's reaction. On 26 January 1950, a committee of professors resolved to establish the "Company for industrial and technical research at NTH". The Norwegian title, "Selskapet for industriell og teknisk forskning ved NTH" gave rise to the slightly contrived acronym "SINTEF", on the grounds that it was an abbreviation of "SINT" (angry) and "EFFEKTIV" (efficient). The acronym was adopted by 13 votes to 12 and its implication remains applicable to this day.

SINTEF was intended to be a tool for the use of NTH, something which is clearly indicated in its mission statement: "[to] promote industrial and other technical research at NTH and to develop collaboration in this field between NTH and the country's commercial

and economic life, as well as with other research institutes". This mission statement was to remain almost unchanged for the next fifty years. By means of a board and general assembly, which was the professorial council of the Institute, NTH maintained full right of control over SINTEF's operations and development.

Pragmatic collaborative model

Karl Stenstadvold was appointed the first Director of SINTEF in 1951. In the reasoning given for the appointment, it was stated: "Here we need a man with good diplomatic abilities, since we must remember that NTH consists of 40 autonomous "republics", each under the leadership of a professor. Hence the Director will be obliged to make progress by negotiation, as it is no use trying to force the individual institutes to collaborate with SINTEF". These were very wise words, and Stenstadvold fulfilled the role in an exceptional manner. He engendered confidence among the professors that SINTEF was an instrument for the benefit of NTH, and under his leadership the collaborative model was developed, not by force, but through pragmatic adaptation.

Stenstadvold was SINTEF's Director until 1976, by which time it had grown to an organisation with 800 employees. Growth occurred by virtue of the fact that NTH's institutes found it interesting and profitable to establish a SINTEF department with which they were associated. The result was that SINTEF gradually came to consist of many rather small departments which evolved under the management of, or in close understanding with, their respective NTH institutes. Research was principally financed by means of third-party assignments and by NTNf. Collaboration with NTH was a prerequisite for success in this market, since NTH provided a guarantee of technical quality.

An oil nation with new potential

In 1976, Johannes Moe became the next Director of SINTEF. His "reign", which lasted until 1989, was marked by major upheavals, both for SINTEF and for Norway as a nation. Norway became an oil-producing nation, resulting in inconceivable growth for SINTEF, which became one of the country's most solid knowledge-based communities in the field.

When Moe took over SINTEF, it consisted of many small departments, with new ones constantly being added. SINTEF had become a large institute but at the same time had lost the ability to make full use of its technical diversity. Finding mechanisms which could realise the multidisciplinary potential of SINTEF became one of the most important tasks at hand. Many attempts were made, but the breakthrough came much later as a result of comprehensive reorganisations.

SINTEF the research consortium

NTNF had founded a number of research institutes for which it retained responsibility. In 1981, the Thulin Committee proposed that the institutes should become autonomous. Then in 1984 it was proposed that the NTNf institutes in Trondheim should be converted into limited liability companies under the ownership of SINTEF. The intention was to create a research consortium with uniform management. This took place, but not without skirmishes. Seven hundred people changed employer and the NTNf institutes NSFI, IKU and EFI became subsidiaries of the SINTEF Group in the form of the majority-owned limited companies MARINTEK, SINTEF Petroleum Research and SINTEF Energy Research.

As a result, the SINTEF Group had almost 2000 employees and was the predominant Norwegian research institute. In the opinion of some, it had become too large, but size provides strength and attractiveness. Thanks to Moe's determined efforts, in his period of office Trondheim acquired several large research facilities, such as the Ship and Ocean Laboratory and the Multiphase Flow Laboratory.

Norway's entry into the age of oil resulted in major assignments for SINTEF, and almost half the company's activities were in some way connected with the petroleum industry. The technological agreements were of great importance. However, this dependence on the petroleum industry resulted in vulnerability, as was demonstrated by the drop in the price of oil in 1986. The most exposed institutes had to reduce their activities by 15-20 per cent, and the period of expansion was over, for the time being.

Nationwide merger

Thor O. Olsen succeeded Johannes Moe in the post of Director. When Olsen assumed responsibility for SINTEF its economic position was weak and there was growing unrest about the future – an unrest which also pervaded the other institutions. NTNf wanted to combine the institutes in the Oslo area, but this was not met with enthusiasm. So the management of SI contacted SINTEF and proposed a merger across the country, which in many ways was an astonishing concept, since SI and SINTEF were keen competitors in a number of fields.

In the letter of intent which formed the background for the proposal we find the vision of transforming the new SINTEF into Europe's leading commission-based research institute as well as a vision of creating a national consortium of technological institutes. This last did not come to pass, but the merger was agreed. In this way, SINTEF became one of the largest independent commission-based research institutes in Europe and was ready and waiting to enter into the European research collaboration which was to come. Mergers are never easy. As somebody said at the time, "The merger has been agreed. Now the work starts". The work is still going on.

Reorganisation

For various reasons, differences arose between Olsen and some of the employees. Olsen left SINTEF in 1995 and was followed by Roar Arntzen, whose first and perhaps greatest challenge was to create a new organisational structure for SINTEF. To a large extent the numerous small departments had lives of their own, and the organisation was not optimal either technically or economically. The central administration was slimmed down and the approximately 30 departments became 12 divisions which closely corresponded to the arrangement of NTNU's institutes. All the managerial personnel were "released" and many changed jobs, both in and outside SINTEF. The reorganisation was dramatic but necessary. SINTEF had to be capable of reaping the benefit of its size.

In 1996 NTH became the Norwegian University of Science and Technology (NTNU). SINTEF's relationship with the university was at times strained, since SINTEF was considered too large and dominating. Karsten Jakobsen, Rector of NTNU said it all in his expression of concern: "Industry was our father and mother and gave us good assignments, while SINTEF was our big brother who took everything from us". There was a need for a tidying-up and a clarification of what the joint activity entailed. The solution was the formation of the Gemini Centres. These are shared groups in which SINTEF and NTNU commit themselves to strategic collaboration. There are now

twenty or so such centres which have given both parties greater influence. The arrangement has subsequently been expanded to include the University of Oslo and St. Olav's Hospital in Trondheim.

Joint efforts

Under Arntzen's leadership, multidisciplinary collaboration really took off. Some of the community's resources were allocated to large collaborative projects directed towards new market niches. These investments have in addition led to new contacts between groups of researchers and provided new opportunities for assignments. This applies particularly to contact between technological disciplines and social scientists.

In 2002, Arntzen retired and was succeeded by Morten Loktu. Loktu was an industrialist, and this was to characterise his regime. A new reorganisation was implemented in which the twelve divisions became six, plus three limited liability companies. Loktu emphasised the importance of creating an efficient SINTEF with the ability to tackle the major technological challenges, especially in the petroleum industry. At times this led to ambiguity with regard to SINTEF's profile: Was SINTEF becoming an advanced consulting firm?

Loktu was with SINTEF for two years before being enticed back into the industrial sector. This time the board decided to recruit a new leader from among its own employees, and Unni Steinsmo, who was Director of SINTEF Materials and Chemistry, was appointed in 2004.

Focus on science

The first test for Steinsmo was what was to become known as "the Iran affair". A subsidiary, SINTEF Petroleum Research AS, was accused of corruption and a corporate fine was imposed on the company. This was a wake-up call. Ethical conduct was placed high on the agenda and SINTEF created ethical guidelines and an Ethics Council. Ethics and HSE became important themes of both internal meetings and in-house training.

So far, Steinsmo's regime has been characterised by three principal objectives: The first is to focus on science. SINTEF shall be a research institute. SINTEF is to work in Pasteur's Quadrant, in which the distance between pure science and practical application is short. SINTEF has also become science-based. The number of publications is on the increase, as well as the number of research scientists with doctorates and close association with the universities. The second objective is to ensure efficient operation and thereby also good economic conditions. SINTEF's economic results have always been modest, with sometimes no profits at all. The focus on efficient operation has in recent years resulted in a good, stable profit. This enables internal technical investment and new infrastructure. The third objective is to maintain efficient collaboration with NTNU. NTNU and SINTEF have different socio-economic duties. Efficient collaboration entails respecting the differences and combining forces where common interests exist. This is achieved through joint management meetings, among other things.

New mission statement

In 2009, SINTEF's mission was finally modified to "to contribute to the development of society by carrying out research in natural sciences, technology and health and social sciences in co-operation

with NTNU. This objective shall be achieved through the acquisition of our own expertise at the highest level and through close co-operation with NTNU, and in collaboration with industry, government and other research and educational institutions". This change is at present the keystone in comprehensive efforts to provide an integrated corporate management of SINTEF. With its 2100 employees and sales of NOK 2.8 billion, SINTEF has become a major undertaking. Although the mission statement is not something that one reads daily, it is important that it is related to reality.

SINTEF's visions are worthy of detailed analysis. The starting point was "research first and foremost". This shows that SINTEF is fully engaged in what the organisation is doing, namely conducting research. That research shall be of high quality and world-leading, but the vision says no more than this. To put it rather bluntly, this could easily be the vision of a purely academic community. When the vision was introduced in the 1980s, it was an expression of the need to reinforce SINTEF's own expertise. SINTEF had grown out of its role as described in the original mission statement. The desire was to stand on one's own academic strength.

The next version, which came during the 1990s, sets a completely different tone: "Technology for a better society" Here, the emphasis is placed on SINTEF's role in society. Research shall provide results – results which shall be made use of and provide benefits for society. With this vision, SINTEF assumes a role in social development, through results and through providing terms of reference for the development of society. The vision signals technological optimism. SINTEF has also become bolder. In recent years we have seen the creation of SINTEF-like views on the development of important social functions with high technological content. SINTEF has become a provider of terms of reference.

An international research institute

SINTEF is currently one of Europe's biggest commission-based research institutes. The goal is to become the most widely recognised, and in a number of technical fields this goal has already been achieved. International assignments and considerable involvement in European research indicate this. What has SINTEF meant for Norway? SINTEF has been a source of expertise and ideas for Norwegian industry and government. Each year about 7000 assignments of various sizes are carried out for approximately 2000 clients. Long-term strategic collaboration has been established with many clients. Because 10 per cent of the research staff are replaced annually, SINTEF has also supplied highly qualified personnel to Norwegian society. This has provided society with valuable technical and managerial expertise.

Sixty years is not a remarkable age for an academic community, but in the course of these sixty years, SINTEF has developed from a fairly modest consultancy organisation for NTH into an internationally-recognised research institute. That's no mean achievement, and well worth celebrating.