Northwest European Loran-C System (NELS) Co-ordinating Agency Office (CAO)

Loran-C in Europe – not the end, but a new beginning

Terje H Jørgensen
Head of the Co-ordinating Agency Office
Of the Northwest European Loran-C System

BIOGRAPHY

Mr. Jørgensen is a 1986 Norwegian Naval and Military Academy graduate. He served with the Norwegian Chief of Defence and the Norwegian Army Materiel Command on financial management and operational planning from 1986 until he joined NELS in 1991.

In the NELS Co-ordinating Agency Office, which is part of NODECA (Norwegian Defence Communication and Data Services Administration), he has been Head of the Office and responsible for the co-ordination of NELS development, operation and maintenance since 1995.

He is a Director of the International Loran Association (ILA), and member of the Nordic and Royal Institutes of Navigation. He was awarded the ILA Medal of Merit in 2000.

ABSTRACT

The paper presents the history of Loran-C in Europe, with particular focus on Norway's leading role. It gives an overview of the current status with emphasis on the political and institutional issues, and it addresses what is seen as key issues when considering the future for Loran-C in Europe, again with particular focus on political and institutional issues. It also contains some specific recommendations in this respect.

INTRODUCTION

At a meeting of the NELS Steering Committee in May 2001, the NELS member nations presented individual statements and agreed on a common NELS official statement from the meeting that will bring the NELS co-operation to discontinuation at the end of the first ten years of the agreement 31 December 2005. The Committee pointed at the limited use of the system as the critical factor leading up to this decision. It is ironic is that now; finally, we are at the point in time when this situation is changing. Adequate receiver equipment is about to be made commonly available and the consequences of depending on GPS alone for multi-modal purposes are becoming fully apparent.

Time has come for Europe to plan ahead. The NELS member nations should focus on how to benefit from the extensive investments that they have made, politically and financially. Non-member nations should focus how they can take responsibility to arrange for a continued life for this critical infrastructure in Europe. And the European Commission must start to take the

political responsibility this body has – not only as the representative for EU member nations, but for the continent and region as a whole.

HISTORY

It is common knowledge that the USCG in the late 50-ies established Loran-C in Europe as part of a military system with continuous coverage from the north-American mainland across the north Atlantic to continental Europe. Less known is probably the fact that Norway, through a Parliament decision initiated by the Ministry of Transport contemplated as early as in 1976 to build two new Loran-C stations in Norway – one along the western coastline and one in the very north of the country.

When Norway and the other nations hosting US military Loran-C stations in 1981 were informed by US authorities that the US funding of these stations would cease in the mid 90-ies as GPS would be put into operation, Norway really started wrestling with finding ways to assure continued operation of Loran-C in her region. In 1983, a proposal to build 9 mini-Lorans in Norway was approved by the Parliament. But part funding by major oil companies operating in the North Sea which was a prerequisite for the Parliament decision turned out not to be possible and the programme was never realised.

The Loran-C Working Group with representatives from The Federal Republic of Germany, Denmark, Iceland, Canada, Norway and USA was set up in 1985 to look into the possibility of setting up an international Loran-C co-operation in Europe. The group presented its recommendation in 1986 concluding that a Northwest European Loran-C chain comprising existing USCG stations and also the building of new stations should be established.

After the responsibility for radionavigation issues in Norway was transferred from the Ministry of Transport to the Ministry of the Fisheries in late 1983, the two stations proposal was updated (1985). The Parliament did not approve this programme awaiting the results of the work in the Loran-C Working Group.

As a follow-up of the recommendation from the Loran-C Working Group, in 1986, IALA invited to an international meeting in London. Interest in Loran-C in Europe, and particularly in UK was increasing, as DECCA was to be faced-out. After the IALA meeting, the Loran-C Policy Group was established under Norwegian leadership with strong support from UK. Members were, in addition to Norway and UK, France, The Netherlands, The Federal Republic of Germany, Denmark, Iceland and Canada. An international agreement was negotiated with terms, provisions, cost-sharing etc. when UK, presumably under pressure from a DECCA lobby surprisingly withdrew from the agreement in mid-1991.

UK had agreed to cover some 20-30 percent of both total NELS initial and operating and maintenance costs, so the withdrawal had near stopped further talks. But the Policy Group under leadership of Mr. Andreas Stenseth was persistent, and through re-arranging the configuration and also renegotiating the cost-sharing arrangements the group met in December 1991 to finalise the agreement. At the opening of that meeting, the Icelandic representative informed that Iceland withdrew from the co-operation effective immediately. This statement made it necessary for Canada also to withdraw since without a station in Iceland, continuous coverage from Canada to Europe was no longer possible. This, again, naturally also led to the decision to take the station at Greenland (Angissoq) out of the configuration.

But again, the Policy Group under leadership of Mr. Stenseth refused to give up and continued talks and negotiations until 1130 pm the same day at which point the final NELS cost-sharing arrangement were ready, covering the gaps created by the Icelandic and Canadian withdrawal. Minor adjustments of the agreement language continued in the spring and 6 August 1992, the remaining 6 countries met in Oslo to sign what is now known as the NELS International agreement.

Mr. Stenseth was elected chairman of the NELS Steering Committee, the co-operation's supreme authorities and held that position in two three-year periods until end 1998 when he declined to accept a third term since he was scheduled to retire before the end of that term. Under Mr. Stenseth's chairmanship, several accomplishments were made:

An interim control system and centre was set up at Bø in Norway to offer NELS control pending finalisation of the NELS Control Centre at Brest, France. This centre was established in less than 3 months (!) and took over control from the USCG Control Centre at Keflavik on the scheduled date 1 January 1995. Mr. Stenseth managed the negotiation of sharing of the Centre initial and O&M costs and he also arranged for the staffing. The Centre was in operation until mid 1999 when the Brest Control Centre took over and NELS operation as initially intended started.

In the meantime, Mr. Stenseth in co-operation with the NELS CAO had already taken the initiative to set up a Technical Symposium in The Netherlands in 1997 to address issues related to the technical developments that had taken place from the signature of the NELS agreement in 1992 as an introduction to a subsequent strategy meeting of the NELS Steering Committee. This lead to the principle decision by the Committee to upgrade NELS with the Eurofix technology and start also to providing differential satellite navigation services. Eurofix came on-air at the Sylt station in early 1998 as a test set up and, after a long period of cost sharing discussions and Control compliance tests also Bø and Værlandet in Norway and Lessay on France in late 2000. The intention has been to upgrade all of NELS to include Eurofix as an integral part of the NELS service.

It has also been an intention to work for Pan-European Loran-C and Eurofix coverage. Adoption of Italy, Austria and the Arab Institute of Navigation as observers to the NELS Steering Committee in recent years, in addition to UK, EC, USA, Russia, IALA and FERNS who were observers from 1992 is one effort in this respect. Another is negotiation with the United Kingdom for membership in NELS and communication with Italy on ways to arrange for Italian membership in NELS, and also deliberation in cooperation with representatives from the Czech Republic and Austria on setting up a station in the Czech Republic.

CURRENT STATUS

NELS is currently operating an 8 station Loran-C system and a 4 autonomous station combined Loran-C and Eurofix system (fig 1 and 2). Users have been relatively scarce throughout the NELS era, for quite obvious reasons. The first and foremost is that The GPS industry has been so dominant that there has been no demand for Loran-C receivers nor any industrial interest in putting money into the development of such receivers. The second one is that the owners of the Loran-C system in Europe – the NELS member nations governments – have not shown an interest in completing their Loran-C efforts by adding on to the building of a transmitting infrastructure also a receiving infrastructure – without which in reality there is no system. Another very important reason is that NELS has not been an operational system

for more than just over 1 year. NELS started its operation in 1995, but due to delays in the development of the control system/centre in France, it was controlled from an interim control centre/system co-located with the Bø Loran-C station in Norway until 2000. This system/centre was totally inadequate when it comes to allowing

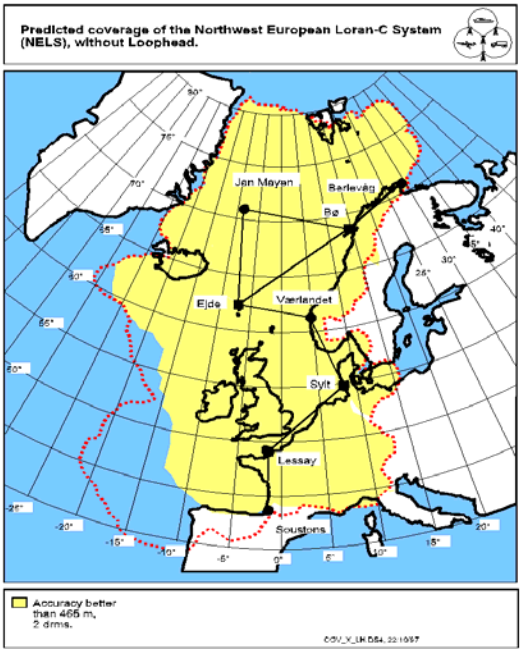

Fig 1 – Current NELS Loran-C coverage

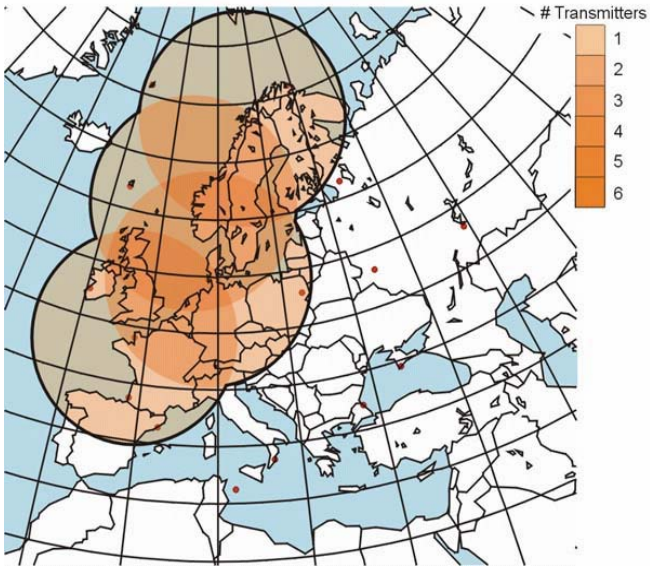

Fig 2 – Current NELS Eurofix coverage

for a timely efficient use of Loran-C integrated with satellite systems, as it was not synchronised to UTC. Without support from the owners of the system - neither financial nor political in that no firm policy indicating that a Loran-C market will be available for a period of time – adequate receiver equipment could not possible have been made available in this very short time.

Despite the lack of support from the owners and also the European Commission and non-NELS nations, a market for Loran-C/GPS integrated receivers are emerging following putting Eurofix on air and a few receiver development are already well in progress. The first will reportedly hit the market in the coming months. In itself, actually opposed by politicians and the market makers, this development is remarkable and very promising. Considering the satellite systems severe shortcomings there will no doubt be a great market in Europe for combined GPS/Loran-C receivers. The question now is if the politicians of the European nations and the European Community want this to be realised.

In this situation, in May 2001, the NELS government issued a statement on the future for the NELS co-operation:

> ***NELS Steering Committee Statement***
>
> *Most of the NELS Governments have indicated that they do not see a future need for Loran-C as a publicly funded position-fixing infrastructure beyond the expiry date of the current agreement*

Some NELS Steering Committee representatives consider that the Loran-C infrastructure can continue to fulfil an important role, especially in the area of the land mobile market, funded by the private sector.

The NELS Steering Committee recommends that NELS members now urgently consider the future of the infrastructure having regard in particular to

- *National positions*
- *Organizational arrangements*
- *Future uses, especially the land mobile use*
- *Future stakeholders, especially private stakeholders*

The motivation for this statement is probably very diverse. One driving factor is most likely an increasing discomfort with spending money on a system that is of very limited use. This concern is very understandable, but the medicine prescribed is not curing the patient but rather killing him. Discontinuing Loran-C will save the NELS nation government money on operation and further development, but it will give them another, substantial bill for cleaning up the sites. And it will leave them without a supplement to a satellite system under foreign control.

The statement points at a discontinuation of NELS in 2005 and it also diminishes NELS as a political factor effective immediately in that, as the NELS nations have near closed the door to future use of Loran-C, NELS views and opinions will in this situation have a very reduced impact on considerations on the future development and organisation of Loran-C in Europe.

THE FUTURE

Two very recent events have dramatically changed the situation for those working for adoption of a more cautious view on the mix of systems for provision of positioning, timing and frequency services for the future. One is the Volpe Center's GPS Vulnerability Report that fully reveals the GPS vulnerabilities and the risks and potentially very severe consequences of adopting a GPS sole-means solution. The other is the cruel and horrible attack on the World Trade Center and Pentagon 11 September that in a very sad way illustrated both with how relatively simple means devastating strikes on the western world societies can be carried through and also how extremely severe the consequences can be. It also showed that protective measures must be implemented in a wide spectre of the western civilisation infrastructure. This disaster will fundamentally change our infrastructure and also parts of our day-to-day life.

Following the Volpe report and in the aftermath of the WTC/Pentagon tragedy, it now seems quite obvious that Loran-C will be continued, revitalised and also expanded. The US Transport Secretary Mineta has himself indicated that Loran-C will be an important element of the future infrastructure in USA and also overseas. In a very short time, also European decision makers will have to take the consequences of this development and endorse the full implementation of Loran-C/Eurofix throughout the European continent and also assure a long life for this infrastructure.

This development changes the fundament on which decision have to be made by the owners of the European Loran-C infrastructure. Appearing so soon after the May 2001 decision by the NELS Steering Committee it opens for a revision of the NELS policy to revitalise the co-

operation and bring it back in position to control the Loran-C upgrade and expansion activities we now are facing. As late as 9 September, I wrote that NELS is heading for discontinuation in 2005 since the prerequisite the NELS nations themselves pointed out to allow for further operation and development of the Loran-C infrastructure – a substantial increase in the use of the system – could not possible have been obtained by autumn 2004 by which time the NELS nation will have to decide whether to continue the co-operation or not. The Volpe report and the WTC/Pentagon incident have changed this reality and provided the NELS co-operation with a new opportunity.

The NELS nations should welcome this opportunity. Not only since continuing the development and expansion of the Loran-C infrastructure is the only way ahead, but also since they have been given the possibility to remain in control of the Loran-C infrastructure in Europe and hence, be able to use the position they have invested so much financial and political resources in obtaining. The NELS organisation still has the possibility to become (or remain) the key European organisation when it comes to operation of regional and possibly also global radionavigation systems.

Should they fail to seize this opportunity, the best way ahead would in my opinion be to have the Loran-C infrastructure included in the mainstream European radionavigation programmes (EGNOS and Galileo), alternatively to put it under NATO control as proposed by the ILA President, Mr. John Beukers. The NATO alternative is interesting in that the future for Loran-C in Europe and also elsewhere is a safety and security issue for which NATO has adopted the responsibility for the entire European continent.

The reasons for my recommendation to include the Loran-C infrastructure in the EGNOS and later also possibly the Galileo programmes are twofold. Firstly, keeping Loran-C isolated from these programmes has proved not to be very ideal – both with respect to creating a basis for a sound development of the system and also to allow a healthy mix of systems for Europe. Operating and developing such systems separated creates suspicion and hostility, which prevents the objectively best solutions. The other reason is that if all multi-modal regional systems are regarded as one entity this will allow part or full privatisation of this overall entity without putting the public interest at risk. Work with the Galileo PPP solution takes into consideration which part of the service must be allocated for public safety and security purposes. It would be natural then to care for the entire infrastructure and not only the space-based element.

Assuring public availability of critical services from a multi-modal, multi-system entity which includes Loran-C/Eurofix would not only protect public interest in a situation where the whole system or parts of it is privatised, as is considered when searching for a viable Galileo PPP solution, but it would also protect public interest in a sabotage/terrorist/war-like situation since Loran-C adds the robust redundancy to the mix as Loran-C system characteristics are very dissimilar to those of satellite systems.

A privatisation of a stand-alone Loran-C/Eurofix that would close the whole or key parts of the service is not recommendable since it would prevent a wide availability of receivers in a critical situation when satellite system services are not available. The whole point of arguing for a continued life for Loran-C is, as I see it, that the Loran-C service is widely and openly available with a wide availability of receivers in a situation where GPS for any reason is not available. Loran-C as a closed commercial service is from a public interest point of view simply not needed. Attempts by NELS to involve commercial partners in order to reduce

costs are still possible. One option is for one or several Loran-C owners to engage a company to take over the operation of the infrastructure under a contract regulating costs and service requirements. Such co-operation could later be expanded to also cover commercialisation of parts of the service allowing for protection of the interest of the owners who would still have full control of the infrastructure itself.

CONCLUSIONS

The Loran-C history in Europe is one with USA (USCG) and Norway in key roles. USA has abandoned Loran-C overseas but is now about to regain a strong interest in seeing Loran-C being continued and expanded at home and in other regions. Norway gave away control and initiative in Europe in 1998 and has yet to establish a new interest in the system. It appears now that the key to a revitalisation of the European Loran-C infrastructure assuring European and global public interest lies in Oslo. Norway has had a leading role in almost the entire Loran-C history in Europe and Loran-C has flourished under Norwegian leadership only. It is now time for Norway both to start protecting her interests and also taking her international responsibilities seriously.

Loran-C is very much needed in the western world. This has been the case in the past, gradually more as the need for positioning and time and frequency services has grown and also after the wonderful era of satellite navigation started. Not everyone has seen this, but now, it is becoming more widely apparent. The need for the service in the satellite navigation era is to add redundancy and robustness to the total infrastructure. Therefore, it is of vital importance that the system is under public control. A closed, separate Loran-C/Eurofix service would just be another commercial system like Starfix and Datatrak, systems that by nature of being closed commercial systems cannot play a public role in a critical time.

Let this be the postscript from the author who is leaving NELS at the end of this year. In my fight for Loran-C, I have been accused of many things, also of being biased. That must have been because I have seen the need for Loran-C all along and have worked hard to make others see the same. It is gratifying to know that I am leaving NELS at a time when the fight for understanding seems to be over. Now is the time for realisation. I wish all involved the best of luck in this work.