

**International Loran Association
155th Board of Directors Meeting**

May 6, 2011, by Teleconference: 1400 hours, British Summer Time
(3:00 PM in Western Europe, 6:00 AM US Pacific time and 10:00 PM in Korea/Japan)

Participating: Sally Basker, Zach Conover, Charles Curry, Sunny Gug, Erik Johannessen, David Last, Bob Lilley, Sherman Lo, Gerard Offermans, Paul Williams, Durk van Willigen,

Not Participating: Langhorne Bond, Chris Bartone, John Beukers, Tamotsu Ikeda, Jacques Manchard, Charles Schue

1. Welcome & Introductions including meeting protocol and identification of Any Other Business. Charles Curry asked that Observations about Anthorn be added.

2. Approval of Minutes: The minutes from the November 30, 2010 (London) meeting were APPROVED without objection.

3. Matters arising: Action items from previous meetings were related to suggestions and plans for meeting(s) to be held in 2011. It was agreed to discuss meetings when we reach points 6 and 7 of today's agenda.

4. Status report on Operations Center: (See attached input paper from Ellen and Bob Lilley). Bob Lilley's Skype connection was badly broken, so much of the meeting continued without his direct participation. Sally read the Operations Center input paper, and it was ACCEPTED without objection.

5. Status report on 2020 strategy: Sally Basker gave a brief update, including information received from Charles Schue. During the first quarter of 2010, a number of people worked to get the strategy group moving. Concern developed as time passed without communication with Langhorne Bond. Just prior to this meeting, Charles Schue reported that he received a request from Mr. Bond that another person take over the group's chairmanship. Chuck informed Sally Basker that he was not volunteering for the chairmanship, but that he would remain on the committee. He suggested that the group could likely proceed and make progress without a designated chair.

President Basker recommended that the 2020 Strategy Committee consisting of Charles Schue, David Last, Sunny Gug and Jim Doherty should proceed without a designated chairperson, and this was APPROVED by the Board without objection.

Zach Conover suggested that a timeline be established for the strategy group to report to the Board. Sally Basker suggested a three-month period for this report. David Last recalled that Charles Schue had previously offered to organize a teleconference from Ursanav in the Washington area, and that such a meeting would still be useful – the suggested time frame is similar to the original objective.

Sally Basker suggested that the committee meet to confirm the three-month delivery goal. This was APPROVED without objection.

6. Status report on ENC conference: David Last reminded the group that at our last Board meeting, we suggested playing a part in the European Navigation Conference (ENC) which the Royal Institute of Navigation (RIN) is organizing in late November to early December this year. This discussion was separate from consideration of whether we would meet in Korea or not.

Professor Last went to the RIN to assess their acceptance of our participation, and received a positive response. David is now on the organizing committee for the ENC-2011, and he described to the 154th ILA Board meeting that we have a good relationship with the RIN, and no financial involvement in either direction. ILA would publicize the event among our members and would assist in reviewing papers if RIN wishes, and that RIN would offer to ILA members their preferential membership rate for the meeting.

This proposal is positively received and will likely be approved at the next RIN organizing committee meeting, shortly. David Broughton is chairing the event, and said he sees no problems. We should be able to assume the RIN/ILA collaboration will go ahead.

Assuming approval, ILA has been asked to distribute information to our members – in particular the date for close of paper submission; the Operations Center is to send out a note to this effect, and encouraging member attendance at ENC 2011.

Gerard Offermans asked if separate Loran sessions were possible. David Last responded that he had not asked for a separate track, and in fact that we may not want to separate, so that we get as much publicity exposure as possible at the meeting. A separate Loran session will happen if there are enough papers. Paul Williams said that Trinity House will submit three Loran papers.

David last also emphasized that this is not the annual ILA convention, but rather a supplemental opportunity for Loran presentations and discussions. Charles Curry expressed his support for combinations and cooperation among conferences. Several other participants agreed with his comment.

7. Status report on Korea conferences: (A message received by the ILA on April 11 from Sunny Gug was presented to the Board by Sally Basker:

[To the] ILA board

This point is very important for Korea to operate the Loran chain with Japan, that has [a] plan to decommission Loran by 2013. Korea has established a special TFT (Task Force Team) whether the Loran will continue or won't. eLoran would be a good option for continuing and setting up an independent chain in Korea.

So, a special seminar for Loran and migrating to eLoran will be held on 14th July 2011.

And I had discussion for holding 2011 ILA annual Convention and technical symposium with KINPR (Korean Institute of Navigation and Port Research). KINPR took satisfaction in [being the] host of the 2011 ILA Convention in Korea. The venue date would be 24th - 26th November 2011 in Busan, Korea.

I am looking for you kind answer for it and make details for the Convention.
Many thanks and Best Regards
Seung Gi GUG

Sally Basker asked the Board whether everyone is happy with Sunny going ahead and organizing the convention in Korea.

Gerard Offermans commented that the proposed date is rather close to the ENC.

David Last responded that this is also an ENC concern – it would be difficult to attend both meetings. He asked about flexibility in the schedule for the (November) Busan meeting?

Charles Curry said he would not be able to justify Korea travel due to ENC in London. Durk van Willigen expressed the same concern.

Sherman Lo asked, “When will Korea make a decision? How would a negative decision affect the attendance and the utility of the conference (either the ENC or the Korean one)?”

Erik Johannessen commented that Korea is running their system presently, and it is not clear that a “decision” is imminent. Also, he has not received any formal communication from Japan about shutdown. This remains uncertain.

David Last asked that Prof. Gug comment on how important the *July* meeting in Korea is. Could it be more important than the November meeting? An alternative to the November meeting would be to support the case for eLoran in July! Sunny Gug responded that the November meeting is more important. July meeting is for the government to make their case for eLoran, and the November meeting would be better for ILA participation.

Sally Basker said that Sunny Gug should be talking to GLAs if not already, if he wants support and papers for the July meeting. It was suggested that Prof. Gug talk to Paul Williams – business cases also. Paul Williams confirmed that the GLAs business case has been sent to Korea.

Paul Williams also commented that a meeting of the ILA in the Far East would encourage FERNS members (Russia, China, et. al.) to attend. The ENC schedule is a concern, however. Is there an opportunity to turn the 14th of July meeting into an eLoran convention, supporting the Korean government, enabling visibility as to what is happening throughout the world of eLoran.

Prof. Gug responded that this week Korea held a domestic seminar and checked results from the jamming event in North Korea. Problems with timing infrastructure were noted. The Korean government convened the July 14th meeting so information can be obtained on Japan’s intent and that of other countries also. Japan’s meeting will be held in October, so the July seminar in Korea is not the full seminar – just organized for the high points of eLoran. The 24-26 November Busan meeting is more important since it occurs after the (Japan) FERNS session in October. So the ILA convention might be in November or later?

Sally Basker summarized by saying we should not focus on the July date, since the November meeting is a more important one. Will the conference in South Korea attract South Korea and China and Japan? Sunny Gug responded that it would.

Prof Gug also delivered regrets from Japan’s Tamotsu Ikeda, who is sorry not to attend today. The news is that Japan is hesitating on termination of the system, in part waiting for resolution in the US. If Japan does terminate Loran, Korea may install an independent chain for Korea only. It was reported that China and Russia also will keep their systems operating. Sally Basker responded that this is excellent news!

In a poll of the attendees, there was a diversity of comment regarding which meeting(s) might be attended. Assuming dates stay as discussed earlier, various members said they intended to participate in both meetings, some members said they would attend only one, and at least two US members reported no sponsorship or support for travel and presentation.

Further discussion resulted in a decision to investigate alternate dates for the November Busan meeting given the close proximity to the London ENC meeting. An e-mail poll of Board members will be conducted by the Secretary, with results shared with the Board. A similar poll may later be conducted with the entire membership.

Sally Basker asked about administrative issues. Bob Lilley spoke for the Operations Center that issues generally center around financial arrangements – none for this meeting. The Center also participates in the

publicity distribution to the ILA membership. The remainder of direct Operations Center involvement is related to registration.

It was reported that for the Busan meeting, Sunny Gug will be Technical Chair, and the members of the Korean Institute of Navigation can handle registration. Prof. Gug agreed to prepare a short paper for the Board, summarizing the meeting details and how it will be organized.

8. Regional Report Europe: David Last reported on policy and business-plan items. UK GLAs were required to prepare full business case, considering the financial aspects of eLoran, comparing with other alternative scenarios, as a backup or complement to GNSS. A large amount of work submitted in September, 2010 – to determine whether eLoran in UK and Ireland would continue and whether the UK station in Ireland would continue. The business case was very positive with respect to eLoran, but a long delay within the UK resulted. It became clear that eLoran has a significant role to play in other modes of transport and applications. The maritime community took several months to investigate whether other modes should be paying their fair share.

Now there are other contributors to eLoran, and the Anthorn station and the program has a one-year continuation. This includes moving to initial operational capability for maritime use in six ports by 2013 and full capability by the start of e-Navigation in 2018. The business case considers the period from now to 2025.

The business case has been confidential until now. It is now incorporated into an IMO document which came out last week. The executive summary is now in the public domain. Copies are to be sent to Board members for distribution. The full report has financial information and is still confidential, accessible by governments. The US requested it. European governments, plus Japan and Korea also received copies.

Paul Williams reported that the GLAs will continue eLoran work unless/until told to stop. Technical work includes rolling out IOC for eLoran by 2013. Political efforts continue within Europe, gathering support. There is direct involvement with the European eLoran Forum. A Moscow meeting in November considered the need to synchronize the northern Norway chain with the northern Chayka chain. Russia is very keen on Loran and eLoran, but Norway has no policy to move to eLoran. The decision-makers need information and support on just what eLoran is. They seem keen to learn, and Trinity House is hosting next week a group of core engineers from the Norwegian Ministry of Fisheries and Coastal Affairs and from Norwegian Defense Ministry. The meeting will include transition to eLoran, review of UK results, and a visit to Anthorn.

Norwegians are interested in keeping Loran-C alive, for the Northeast Passage, and in linking up with Russia.

The French are carrying out a differential Loran trial, considering two-way satellite communication links. A French technical meeting is scheduled for June in Paris (a repeat of the meeting that was held in 2009), similar to technical meetings that were held during the NELS era. Paul Williams hopes to learn more about the differential trials, and details on station synchronization.

Charles Curry referenced the Chronos GAARDIAN project and mentioned the Royal Academy of Engineering report by Martyn Thomas, "Global Navigation Space Systems: Reliance and Vulnerabilities." (A link to this report was sent to the Board by the Secretary on March 31. For reference, the link is www.raeng.org.uk/news/publications/list/reports/RAoE_Global_Navigation_Systems_Report.pdf, and the full text of the accompanying e-mail is attached to these minutes. -ed)

Recommendation C9, under "Increasing Resilience" in the Executive Summary: "...The provision of a widely- available PNT service as alternative to GNSS is an essential part of the national infrastructure. It

should be cost-effective to incorporate in civil GNSS receivers, and free to use. Ideally it should provide additional benefits such as availability inside buildings and in GNSS blind spots. We are encouraged by progress with eLoran in this context.”

Charles Curry also commented that Chronos’ SENTINEL project for emergency and security services has detected high interest in eLoran. There appears to be strong support from within the UK Home Office to fund UK Loran. However now may not be the best time to announce new technology funding, given layoffs of police, etc. The current one-year eLoran extension in the UK is fairly low key.

9. Regional report Far East: Prof. Gug reported that China and Russia are very positive, Korea will continue if Japan pulls out, and Japan is looking to see how the US resolves the current Loran shutdown. Japan has closed one station in Minami Prefecture. There is a plan to terminate the system in December 2013, but there are still discussions ongoing.

On 3 May there was a domestic seminar in Korea on countermeasures for GNSS jamming, with some 200 participants from the public sector, maritime and aviation also. The UK Business Case was described as very useful. eLoran was described as a good option as a jamming countermeasure.

In IALA’s April meeting, committees made use of the UK Business Case and took account of the eLoran option.

10. Any Other Business:

Sally Basker asked Erik Johannessen about any US developments. Erik had no comment at this time.

Charles Curry asked, “What is the resilience specification for EUROFIX from Anthorn?” Paul Williams responded that the problem was with the UTC message on EUROFIX, not the EUROFIX transmission itself. The GLAs have a service-level agreement with Babcock (former VT Communications) for availability of the navigation signal, but there is no requirement which places performance numbers on EUROFIX. Paul Williams said the UTC problem is “in hand” and will be corrected. He asked the group to remember that Anthorn is a prototype, but that eventually *all* components of eLoran will be specified.

In response to a question on UTC, Paul Williams replied that the UTC message is on Anthorn, Sylt and also Lessay (7499) at present.

It was noted that Anthorn is off air right now for two days of planned maintenance. Accuracy is running about 50 meters without Anthorn – a clear indication of the value of the station.

Charles Curry reported progress on correcting phase hits that can occur when a station goes off-air for whatever reason. Indicates that new developments are still going on in Loran!

David Last remarked that publicity and awareness are needed. The UK has had a prototype eLoran operating for 1-1/2 years. It is real, not just a recommended system – operational, live differential Loran. Durk van Willigen agreed. The system needs visibility. Many people think Loran is in the past.

Sherman Lo made a request: To help answer an inquiry from Changdon Kee of S. Korea, Sherman needs some official documents reasons for the US shutdown. If anyone has access to letters or documents from the Coast Guard or others, please send a copy to Sherman.

Adjournment: The meeting was adjourned at 1530 hours BST.

International Loran Association
155th Board of Directors Teleconference -- May 6, 2011
ACTION ITEMS

- Sally Basker suggested that the [ILA 2020 strategy] Committee meet [without a designated chair] to confirm the three-month delivery goal [for a report to the Board]. This was APPROVED without objection.
- Assuming approval [for collaboration with RIN at the ENC 2011 meeting], ILA has been asked to distribute information to our members – in particular the date for close of paper submission; the Operations Center is to send out a note to this effect, and encouraging member attendance at ENC 2011.
- ... discussion resulted in a decision to investigate alternate dates for the November Busan meeting given the close proximity to the London ENC meeting. An e-mail poll of Board members will be conducted by the Secretary, with results shared with the Board. A similar poll may later be conducted with the entire membership.
- Sunny Gug agreed to prepare a short paper for the Board, summarizing the [24-26 November Busan] meeting details and how it will be organized.
- The GLAs business case [document] has been confidential until now. It is now incorporated into an IMO document which came out last week. The executive summary is now in the public domain. Copies are to be sent to Board members for distribution.
[Completed 6-4-2011]

ILA Operations Center Input Paper, 155th Board of Directors Meeting

On 6 May 2011, at 02:48, ILA Operations wrote:

The ILA Operations Center continues to support the Association:

Coordinating the Membership Renewal for 2011

Initiating coordination and support for the 2011 ILA election

Responding to or referring inquirers - phone, e-mail - for members and the public

Distributing Loran-related news to Board and membership

Maintaining and reporting day-to-day ILA revenue and expenses

Maintaining ILA computer hardware, software, files

Maintaining ILA assets in storage -- convention materials, proceedings,

Collaborating on ILA web site updates

Supporting Loran Lines with materials to editors and electronic distribution to members

Drafting abbreviated 2010 "proceedings" for the London meeting (Sorry for delay!)

Standing ready to support Board decisions on 2011 meetings or collaborations

No near-term decisions on operational subjects are needed.

Thank you.

**Text of e-mail received March 31, 2011, from the editor of *ATC Reform News*,
a publication of US-based The Reason Foundation**

From: "Bob Poole" <bobp@reason.org>

Subject: new issue of ATC Reform News

In this Issue: ...deleted text...

Concerns Over GPS Vulnerability Escalating

Two more recent events have increased people's awareness of the vulnerability of GPS and other satellite based position-navigation-timing systems, generally referred to as GNSS (global navigation satellite systems). One was warnings from many scientists that upcoming solar storms could short-circuit electric power grids and disrupt GNSS signals. The other was the Federal Communications Commission's premature approval of a plan by broadband communications company Lightsquare to install up to 40,000 terrestrial base stations operating on L-band frequencies adjacent to the L1 band used by GPS (both civil and military). Both the FAA and the Defense Department raised objections, and avionics firm Garmin presented test data showing "disastrous interference" with GPS receivers from a simulated Lightsquare base station. In response, the FCC has required the company to work with the GPS community to assess the interference problem. The working group submitted their test protocol to the FCC on Feb. 25, but both DOT and DOD expressed concerns in a letter to the FCC dated March 25.

As these concerns were being raised, the **Royal Academy of Engineering in London released a report early this month called "Global Navigation Space Systems: Reliance and Vulnerabilities."** Like previous reports from various expert bodies in this country, it documented the growing worldwide use of GNSS, not only in transportation but in agriculture, finance (electronic time-stamping of documents), and numerous other fields. (www.raeng.org.uk/news/publications/list/reports/RAoE_Global_Navigation_Systems_Report.pdf) All GNSS applications are vulnerable not only to failure but to disruption and interference, both from nature (e.g., solar flares) and from human causes, both inadvertent interference and deliberate jamming.

This report underscores two points which are often not appreciated by the aviation community:

1. GNSS vulnerability affects a vast portion of economic activity, not just aviation or transportation;
2. GNSS vulnerability is a global, not just an American, problem.

Consequently, back-up system(s) must be across-the-board (not aviation-specific) and global in nature.

Like most previous assessments that meet the above criteria, the Royal Academy identifies eLORAN as the best available option as the back-up system. That was also the conclusion of those taking part in the Global Navigation Satellite Systems (GNSS) Interference, Detection, and Monitoring Conference in London earlier this month. As the researchers pointed out, eLORAN is a modernized version of the long-range navigation system put in place in the 1950s, primarily for oceanic navigation. It operates in a completely different frequency band (100 kilohertz), compared with GPS at 1.5 gigahertz. Jamming eLORAN is possible, but requires a huge and conspicuous source of power. And while eLORAN is not as effective for GPS, it can serve as an adequate backup. In addition, its cost is quite modest.

As I have reported here several times before, eLORAN was selected two years ago by an interagency study team as the U.S. backup for GPS. But that decision was overturned by the Obama Administration early in its term, for reasons that have never been explained. If the Administration knows of some heretofore unknown defect in eLORAN that makes it unsuitable as the GPS backup, it should make that information public, before Europe and the rest of the world move forward. And it has an obligation to propose an alternative that is both suitable for all applications (not just aviation or transportation) and usable worldwide. – end –