

**HSL-ZUID  
NETHERLANDS**

**ALSTOM STRUKTON VOLKER  
TUC-RAIL ABN-AMRO HSBC**



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FROM:  
DATE:

R.O. van Manen  
October 20, 1999

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YOUR REFERENCE:	
OUR REFERENCE:	4957-98220
SUBJECT:	Statement on signalling technology

Dear Mr. Voorhoeve,

Referring to the 4<sup>th</sup> Consultation Meeting on 16 September 1999, we herewith send you an outstanding action from our Consortium concerning the signalling technology.

An electronic copy of this document will be sent to you very soon.

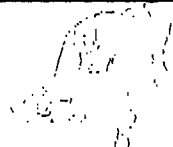
Yours faithfully,

R.O. van Manen

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Author:	ASNL/JA	Date:	991020	

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## STATEMENT

## ON SIGNALLING TECHNOLOGY

## FOR HSL-ZUID


Datum van verslag:	
Exploitant:	
Afdeling:	
Aan:	
Kopie:	

**FOURTH CONSULTATION MEETING ON 16-SEPT-1999**

Statement signalling technology related to HSL/U199903017 dated 14.10.99

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Date : 19-Oct-99

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## 1. General

The ALSTOM/STRUKTON/VOLKER-STEVIN Consortium is fully willing to provide an ERTMS LEVEL 2 signalling system for the HSL-Zuid Project.

The ERTMS LEVEL 2 system is under development at this time, and the forecasted date for certification of this technology is compatible with the construction schedule of the Project. Therefore the Consortium's intent is to provide HSL-Zuid with an ERTMS LEVEL 2 signalling system.

The real time needed to get the certification of the ERTMS LEVEL 2 may differ from the forecasted one, due to extra delays in the adoption of the specifications or unforeseen work to obtain the certification. It is therefore prudent to envisage a fall back solution which could be implemented in case the ERTMS LEVEL 2 is not ready in due time.

The approach of the ALSTOM/STRUKTON/VOLKER-STEVIN Consortium is as follows:

## 2. ERTMS LEVEL 2 Certification Process

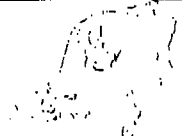
As stated in BEV21 development contract:

1. The system will be developed following the ERTMS April 98 baseline.
2. The parts of this baseline that are affected by the ERTMS UNISIG Class 1 specification will be changed in order to make the system UNISIG Class 1 compliant. These changes will be submitted by ALSTOM by means of change requests and will be made without impact on the cost and planning as agreed in the contract.
3. If the UNISIG Class 1 specification does not form a stable basis for the design by 15/11/99, ALSTOM will implement those items that are stabilised and will make proposals for implementation for those items that are not yet stabilised.
4. For items not firmly specified in the ERTMS April 98 baseline ALSTOM will make proposals for implementation.
5. During the Requirement Elicitation phase, the present clause will therefore be exploded in requirements resulting from
  - the April 98 baseline (as per §1 above),
  - items stabilised in Class 1 (as per §2 above),
  - items not yet stabilised in Class 1 (as per §3 above),
  - items not yet firmly specified in the April 98 baseline (as per §4 above).

The revised requirement data base produced accordingly will be submitted to NS-RIB approval. It will constitute the basis for traceability of the design.

Nowadays, the Class 1 specification is under revision. The development of the BEV21-ERTMS LEVEL 2 is running and will be fully tested (including acceptance tests by RIB) and associated with a safety case for **may 2002**. At that time, the certification process will not yet be completed.

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The certification process is still unclear and no notified body has been nominated yet. To compensate the present absence of such a notified body, ALSTOM will nominate a independent safety assessor to demonstrate that the proposed system is a safe signalling system which satisfies the needs of railway networks. Regarding interoperability, TSI (Technical Standard for Interoperability) will follow Class 1 specification, at an undefined date. The BEV21-ERTMS LEVEL 2 system, which will comply with the Dutch requirements and be ready in may 2002 is therefore not totally guaranteed to be interoperable.

### 3. HSL-Zuid Project Schedule

The HSL-Zuid line is to be opened in mid 2005. According to the master schedule and looking backwards in time, the following steps need to be completed before the opening of the line:

- 3 months Homologation and Operation Staff training,
- 3 months HSL System tests and Acceptance,
- 3 months Subsystem tests and verifications,
- 1 year Installation,
- 6 months prior to start of installation: start of component production,

so that the start of the production needs to take place two and a quarter years before start of revenue operation.

Before the start of construction, some study work is needed, including general and detailed design. Some of this work is technology related and therefore dependant of the selected signalling system, i.e. ERTMS LEVEL 2 or fall back. The estimation of this duration is:

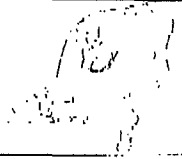
- 3 months technology dependant design

The choice of the signalling technology for the startup of the operation needs finally to occur two and a half years before the start of revenue service, and the selected technology needs to have a safety case to be certified at the date of the choice, i.e. end of 2002.

### 4. Fall Back Technology

If the ERTMS LEVEL 2 signalling (programmed for may 2002) is not available at the above mentioned date of choice (end of 2002), a fall back signalling system needs to be put in place.

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ALSTOM/STRUKTON/VOLKER-STEVIN proposes to select as this fall back technology the TBL2 actually in the certification process for the Belgian High Speed Lines. The first section where TBL2 will be used is the part of the south line between Lembeek and Brussels, the system is already installed and the Thalys rolling stock equipped.

As soon as the system is certified the high speed trains will be able to run at 220 km/h on this section of line instead of 160 km/h to-day.

The TBL2 system will also be used without further certification needed on the belgian East HSL from Brussels to Liège, which is due to open in 2002 with a maximum train speed of 300 km/h.

### 5. Upgrade from TBL2 to ERTMS

In order to cope with all the needs of TBL2 and ERTMS LEVEL 2, provisions will be made during the early stage of the design to manage the interface with other subsystems (power supply needs, civil works, etc...).

At the end of 2002, if the selection is made to install the TBL2 signalling system at startup of the HSL-Zuid line, an upgrade plan to the ERTMS LEVEL 2 needs to be prepared. The outline of such a plan will be included in the offer and will include:

- ✓ Civil work requirements for the future installation of the ERTMS LEVEL 2,
- ✓ Specific cabling (design and installation),
- ✓ Interface between T km/h.BL2 and ERTMS LEVEL 2 equipment,
- ✓ Time schedule for the implementation of the ERTMS LEVEL 2,

The migration from TBL2 to ERTMS LEVEL 2 is mainly an upgrade of the capabilities of the trackside processing center and the addition of the GSM-R network. No heavy works (no cabling, no digging) are requested along the track; eurobalises only (without cabling) have to be inserted between the rails.

Note: Thalys trainsets are already equipped with the on-board TBL2 system, but they would require additional equipment in order to be able to run under the control of ERTMS LEVEL 2.

### 6. Perspective of ERTMS LEVEL 3

ERTMS LEVEL 3 is an all-radio based signalling system which is not in use anywhere at this time. Development and certification of this system is not compatible with the dates of HSL Zuid. Therefore, ERTMS LEVEL 3 being available at the time of renewal of signalling equipment will possibly be used as an upgrade at that period. ERTMS LEVEL 3 is not

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considered in this document which deals only with the construction period and subsequent upgrade to ERTMS LEVEL 2 if applicable.

### 7. Time Schedule

The time schedule presented at the Second Consultation Meeting on 16-July-99 is appended here as a reminder of the presentation on signalling. The HSL-Zuid deadlines are shown compared to the availability (after certification period) of the different signalling systems.

