



Report on the 2015 ERTMS Market Consultation

For external use

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1 Introduction - ERTMS market consultation

1.1 Aim and market consultation process

The ERTMS Programme organised a market consultation in a series of sessions over the period March-October 2015. The aim of the market consultation was to identify the market options and preferences for implementing ERTMS in the Netherlands, and also to obtain answers to the questions raised within the Programme. A series of information meetings was held for this purpose in March and April. A market consultation document was subsequently prepared which presents the objectives, ideas for the procurement and contracting strategy, the scope, time frame for the ERTMS programme and further aspects¹. This document also explains the questions on the topics the Programme wanted to submit to the market parties. The market consultation was announced on TenderNed on 12 June 2015. The market consultation document was appended to the announcement on TenderNed and was sent to all market parties who had registered for the kick-off meeting on 9 July 2015. During the kick-off meeting explanatory presentations were held on the content of the market consultation².

Based on the responses received, a number of market parties were invited for an in-depth meeting to further discuss selected topics in the market consultation document. Meetings were held with a total of twenty-two market parties, five of which were also invited to a technical meeting on the infrastructure.

1.2 Aim of this report

The aim of this report is twofold. First, the Programme has drawn up this report to share the results of the market consultation with the market. These results have intentionally been presented anonymously in broad outline to safeguard the confidentiality of the information provided by the market parties. Second, this report serves to share with all parties the information the Programme communicated to the market during the various meetings to ensure a level playing field.

1.3 Market consultation rules of play

The rules of play for ensuring confidentiality and a level playing field were shared with the market in the market consultation document. These rules of play are set out in Appendix 1 to this report.

¹ This document can be downloaded from www.ertms-nl.nl.

² These presentations are also available on www.ertms-nl.nl.

2 Results in broad outline

2.1 Procurement and contracting strategy

During the market consultation the discussion of the procurement and contracting strategy centred mainly on models, forms of collaboration, types of contracts, the financial value of the lots to be put out to tender, contract variants for rolling stock and infrastructures and the possible format of the tender(s). The Programme will include all the considerations communicated to the Programme when developing the procurement and contracting strategy. Background information and the questions relating to these topics are included in the market consultation document (Sections 5 and 6.1).

2.1.1 Procurement and contracting strategy models

It emerged from the market consultation that the majority of participating parties have a preference for integrated contracts, whereby the Design, Build and Maintain (DBM) components are contracted in their entirety. The underlying reasons communicated to the Programme include the following:

- Integrated contracting reduces the number of interfaces between the systems of the various market parties, which mitigates the associated risk;
- Integrated contracting enables maximum utilisation of the available knowledge and expertise of the market;
- Integrated contracting can bring more competitive aspects and thus lower the total costs and boost the realised result.

The following counter-arguments (and hence points to be addressed) were also communicated to the Programme:

- Successively putting out to tender and entering into separate contracts for the individual Design, Build and Maintain components (D+B+M) reduces vendor lock-in;
- Non-integrated contracting could offer more parties an opportunity to work on a contract, which would foster competition;
- Non-integrated contracting could prevent market parties from prior exclusion due to their inability to find a partner to form a consortium (only a handful of market parties are available for a number of competencies).

2.1.2 Forms of collaboration and types of contracts

Many market parties indicated that they were willing to collaborate closely with other parties in implementing ERTMS. Their views on the form of any such collaboration differ. Various suggestions were put forward such as creating Design and Build teams, creating an alliance model in which the client(s) would also participate, a collaboration agreement entailing a best efforts obligation or an obligation of result, or conversely abandoning the above forms of collaboration entirely. Most parties indicated their preference for an incentive scheme in the form of a bonus rather than a penalty.

2.1.3 Financial value of the lots to be put out to tender

All market parties were asked to state the minimum and maximum contract value they had in mind. This information clearly is confidential and is not discussed any further in this report.

2.1.4 Contract variants for rolling stock

Among the contract variants for rolling stock, a preference emerged for dividing the trains into train types (rather than owner or age, for instance) to minimise double engineering and the associated costs.

2.1.5 Contract variants for infrastructure

Among the contract variants for infrastructure a preference emerged for dividing the contracts into geographical areas (rather than merely a functional division). The preferences as well as the advantages and disadvantages of each contract variant were also identified and discussed.

2.1.6 Dialogue during procurement procedures

The Programme asked the market parties about their experiences relating to the dialogue conducted during procurement procedures, including their experiences of non-railway projects. It emerged that the market parties much appreciate the opportunity to contribute their ideas and reflect on the Programme plans in advance of the tender, such as during this market consultation. They indicated that clearly communicating the performance requirements and the corresponding schedule in advance ultimately enables them to submit a more realistic and also more favourable bid. Various market parties stated that late adjustments to the performance requirement or specifications during a procurement procedure often are a costly affair.

A specific opportunity for creating a dialogue that was brought forward during the discussions is the competitive dialogue. During this procedure, the client selects a limited number of market parties on the basis of selection documents in order to reach a solution by means of dialogue. On the whole this format met with a favourable response from the market parties although they also presented the Programme with a number of counter-arguments.

During the discussions on the procurement and contracting strategy, the following points were raised, which the Programme would like to share with all market parties.

- In terms of financial planning, the Programme indicated that the financial flows relating to the implementation of ERTMS in the infrastructure are anticipated to commence in 2018 and that around one tenth of the total budget (€250 million a year) will be spent on an annual basis.
- Should an alliance model be selected, the Programme can imagine that incentives might be incorporated in a contract to ensure that the performance requirements in the area of safety, interoperability, speed, capacity and reliability are fulfilled.
- The Programme stated that elements of the Danish model may be adopted but that the model cannot/will not be replicated, one reason being that Denmark has implemented ERTMS across the entire country at once.
- The Programme indicated that Level 2-only implementation at the Amsterdam and Utrecht stations is still viewed as a considerable challenge for the market and is therefore further examining this issue.
- The Programme stressed the need for a backup plan for the implementation of ERTMS and for comprehensively testing the systems, partly due to the recommendations submitted by the House of Representatives of the States General following the parliamentary enquiry into the Fyra high-speed train.
- The Programme wishes to emphasise that the entire ERTMS life cycle forms an integral part of the Programme scope.

2.2 System integration

The discussions on system integration centred on the role and the fulfilment of that role by an independent party with responsibility for system integration. Background information and the questions relating to these topics are included in the market consultation document (Section 6.2).

2.2.1 Position and role in relation to the client

One of the choices that will need to be made concerns the position of the system integrator in relation to the Programme. The system integrator might be a party who oversees the whole system and makes adjustments as necessary (even down to the level of amending concluded contracts). On the other hand, system integration could be put out to tender as a separate task under an integrated contract. Linking the system integrator to the role of the client will ensure that the interests of the client and the system integrator do not diverge. On the other side of the coin, assigning system integration to a market party could ensure that ultimate responsibility is taken for guaranteeing that an effective, fully functioning overall system will be delivered.

If the system integrator is an independent party who is required to maintain oversight, a decision must be made on (1) the degree of control (process-oriented) and (2) the degree of technical responsibility.

In a number of discussions on system integration the possibility of working with common KPIs was discussed, which would enable parties to be called to account for their share in achieving the final result. The definitive KPIs may relate to services for passengers and the transport operator.

2.2.2 System integrator's tasks

During the discussions, the options for clearly setting out the allocation of tasks, powers and responsibilities were discussed. Ensuring that the system integrator's tasks and responsibilities are transparent to all other parties concerned is an important step in providing certainty that all parties are working towards the same goal and that successful system integration is achieved.

Several suggestions were made for the system integrator's tasks, including:

- Ensuring good train-track integration and that test facilities are available for this purpose.
- Ensuring the proper and continued interoperability of the old and new systems.
- Ensuring that the geographical spread will in fact result in well-integrated pieces of technology.
- Safeguarding transparency in the system integration process, paying attention to the different levels and aspects of system integration.
- Validating design decisions.
- Monitoring controlled new developments.
- Alerting parties in the event of contradictory specifications.
- Being wary of inflexibility arising from overspecification.

2.2.3 Mandate

The market parties stated that the tasks assigned to a system integrator must be in line with the mandate issued to the incumbent. The Programme cannot assign a party responsibility for delivering a fully functional overall system if that party is unable to intervene. Moreover the system integrator's role and mandate must be clear to the other parties involved.

During the discussions on system integration, the following points were raised, which the Programme would like to share with all market parties.
Since this Programme has 'major project' status, governance must also be addressed during the implementation and management phases.

2.3 Transport system

The discussions on the Transport system centred mainly on the specifications, RAMS performance and fall-back systems. Background information and the questions relating to these topics are included in the market consultation document (Section 6.3).

2.3.1 Specification

The market parties warned the Programme of the risks associated with overspecification. To illustrate this, they stated that specifying the exact locations of the systems in the infrastructure would deprive the market parties of the opportunity to compete on the basis of their knowledge and expertise. During most of the discussions a clear preference emerged for functional specifications to the level of subsystem interfaces. Within these subsystems the supplier expects to be at liberty to offer the best solution. A number of market parties indicated that the Programme must ultimately provide specifications that are unrelated to existing brands, market parties and products. This should be based on currently available standards, while being alert to an abundance of country-specific customisation.

During the discussions the market parties requested that particular attention be paid to specifying user aspects. Against this background the importance of giving consideration to training courses, putting the system(s) into operational service, the design processes and the design rules were further discussed.

The good performance of the ERTMS system at the transport system level necessitates the assessment of the performance of the individual components combined. This means that transparent information on the performance of the subsystems must be made available and that the interaction between these subsystems should be monitored and analysed in a transparent manner.

2.3.2 RAMS performance

It emerged from the market consultation that it is difficult to obtain accurate RAMS performance figures from the market for several reasons. Discussions were also held with the market parties about responding to various challenges such as the following:

- Validated figures can only be obtained from practical ERTMS implementations, of which only a limited number are available. The available figures were achieved in specific external circumstances and therefore may not be applicable to other situations. The figures were not always determined in the same way and for that reason cannot automatically be compared because the architecture and the system requirements must be identical.
- The performance figures achieved do not show the maximum achievable performance, but are based on the budget and the requirements for that particular implementation.
- The RAM budgets allocated for the subsystems should be in accordance with the products available on the market or what can reasonably be developed. In order

to determine these budgets it is of vital importance to use the knowledge available in the market and to work together in formulating these requirements.

Many market parties acknowledge that the availability of GSM-R is a crucial link in the chain. This is reinforced on account of the fact that there is relatively limited practical experience available, or none at all of: a) the use of ERTMS on busy nodes b) GSM-R combined with Enhanced GPRS (EDGE) for ERTMS.

2.3.3 Possible fall-back systems

A number of suggestions for potential fall-back systems were put forward during the market consultation, including a pilot system, a system based on improved GPS or Galileo, a 'white light system', consisting of legacy systems, a range of Level -1 variants (potentially with switchable balises) and alternative network types such as LTE.

During the discussions on the transport system, the following points were raised, which the Programme would like to share with all market parties.

- While TMS is deemed to be extremely important by the Programme, it falls outside the scope of this Programme. In the years ahead specific projects relating to TMS systems may be combined with the ERTMS Programme, but there are no plans to do so at present.
- One option would be to use a separate set of test specifications for systems typically used in the Netherlands.
- The Programme has taken the use of open standards into account for monitoring systems.
- The Programme plans to use axle counters where there is a demand for train control combined with a need for higher capacity.
- The Programme stated that the maturity study will be updated to include the latest experiences with GSM-R and Level -2 only implementations on major nodes in Austria.

2.4 Rolling stock

The discussions on rolling stock centred mainly on conversion capacity and resources, site surveys and possible scenarios for STM-ATB. Background information and the questions relating to these topics are included in the market consultation document (Section 6.4).

2.4.1 Conversion capacity and resources

During the discussions the Programme was looking for suggestions for the conversion of trains, in which the intellectual property rights would be vested in specific systems. The discussions enabled the Programme to gain an understanding of the approach preferred by the various market parties. In addition a few suggestions were made for achieving the desired result.

Another problem area that was highlighted, in addition to railway workshops and staff, are the options for taking rolling stock out of the timetable. The market parties asked that clarity be provided on how long rolling stock would be available for conversion. On the topic of qualified staff for carrying out conversion, most market parties generally stated that this would not pose any major problems. However, opinions differ considerably on workshop capacity. Various scenarios were discussed such as designing dedicated conversion workshops and using the existing workshops of various market parties.

To optimise engineering work, a lot divided into train type series has the strongest preference.

2.4.2 Site surveys

It emerged from the market consultation that site surveys of the rolling stock would be desirable in order to draw up a tender for conversion to ERTMS. Engineering documentation alone would be inadequate because not all 3D details can be seen and the documentation is not always current. According to various market parties, by conducting a site survey (in other words turning train types inside out before the call for tenders), the Programme may receive more competitive bids because the risks will have been more accurately assessed and factored in. The estimated duration of a site survey is around one day for each train type.

2.4.3 STM-ATB

Various scenarios were discussed with the market parties relating to STM-ATB issues (the fact that there are only two suppliers who can deliver at present). Based partly on the suggestions received by the Programme and the preferences expressed by the market parties, the Programme will continue to develop an appropriate strategy.

During the discussions on rolling stock, the following points were raised, which the Programme would like to share with all market parties.

- As an indication, the Programme stated that a period of three to six years is being considered for the conversion of all the rolling stock to ERTMS.
- The Programme has placed a strong emphasis on ensuring a level playing field in respect of market parties with prior knowledge of rolling stock, thereby enabling all market parties a fair opportunity to submit a bid.
- The Programme confirms that there are significant differences between trains, even within a series. The Programme is currently collating all the available knowledge on rolling stock.
- During the discussions the Programme confirmed that the residual capacity of rolling stock both at NS and the other rail operators forms a constraint in planning the conversion.
- As an indication, the Programme stated it is looking at around 35 units of rail maintenance rolling stock that will need to undergo conversion. The Programme is examining whether the ERTMS programme could supply an existing STM product for a prospective tender for rolling stock and, if so, whether the ERTMS programme should develop external a new STM to supply for this purpose, thereby ensuring that this component of the on-board configuration would be available to all potential tendering parties. Efforts to achieve the desired level playing field for the nationwide roll-out programme are already underway. This includes the development of an STM-ATB EG. Possibilities for ATB NG are also being looked at, given that the STM-ATB EG is not suited for this purpose.

2.5 Infrastructure

During the market consultation discussions on the ERTMS infrastructure, the following topics were considered:

- Using Commercial-off-the-Shelf (COTS) Programmable Logic Controllers (PLCs) as object controllers for decentralised safety components.

- Definition and size of RBC areas and RBC-RBC handovers.
- Exchanging ERTMS configuration data between the infrastructure controller and the supplier.
- Centralisation of RBC and IXL systems and the network architecture.

The findings arising from the market consultation on these topics are discussed in the following paragraphs. Background information and the questions relating to these topics are included in the market consultation document (Section 6.5).

2.5.1 Using COTS PLCs as object controllers for decentralised safety elements

The advantages and disadvantages of using PLCs as object controllers for decentralised safety components were discussed with the market parties. The market parties raised a number of points for consideration by the Programme relating to the direction presented. One of the points raised by the market parties is the system integration (and therefore the system integration risk) of equipment, with which the suppliers are 'unfamiliar'. It would be more realistic to work towards a set of defined, open interfaces between the building blocks (vendor-specific system components). In this context, the market parties referred mostly to EULYNX. However, the market parties drew attention to the long production lead times and the expectation that the results of EULYNX would be available too late.

2.5.2 Definition and size of RBC areas and RBC-RBC handovers

Several infrastructural layout configurations in the Netherlands were discussed with the market parties and the associated problems. The most appropriate definition of the topology of an RBC area (small versus large) generally appears to be determined by two conflicting parameters:

- *Small* RBC areas introduce many RBC handovers with all the associated problems (see issues in the market consultation presentation). Moreover RBC handovers carry a number of risks, for which no proven solutions are available to date. Based on this fact, an RBC area should be defined as widely as possible.
- The disadvantage of *large* RBC areas is that implementing configuration changes in the infrastructure could affect the traffic flow. This could have a significant impact on 24/7 railway junctions such as Utrecht. After all, train services in the whole area will need to be suspended even for a minor change on a small section of track. The smaller the RBC area, the smaller the impact of the interruption.

2.5.3 Exchanging ERTMS configuration data between the infrastructure controller and the supplier

The market parties were consulted on the possibility of exchanging ERTMS configuration data in the manner proposed in the market consultation document, which generally met with a favourable response.

2.5.4 Centralisation of RBC and IXL systems and the network architecture.

The possibility of installing the central RBC-IXL systems in data centres, the possibility of remote monitoring and remote management and the requirements that this would impose on the required networks were discussed with the market parties.

During the discussions on infrastructure, the following points were raised, which the Programme would like to share with all market parties:

- The Programme believes that it is a risk that when an RBC is taken out of service to modify a railway line, unavailability will occur on all railway lines under the RBC's responsibility.
- Generally speaking, primary authority for the implementation and management of GSM-R-related matters lies with ProRail, and not with the ERTMS Programme. However, both parties coordinate effectively with each other on GSM-R-related matters.

During the additional infrastructure discussions, the Betuwe route connection and the Utrecht-Den Bosch corridor were discussed. The Programme provided the following information for the purpose of these discussions:

The Betuwe route and the Utrecht-Den Bosch corridors were discussed in the context of RBC-RBC HO. We are examining aspects such as the relationship between the RBC areas and the corridors (e.g. the corridor crossing the Betuwe route and Utrecht-Den Bosch at Meteren). One point to be considered is that these corridors are controlled by different Traffic Control Centres (VPT systems).

As a concrete example we have questions relating to whether an RBC-RBC handover is possible for this corridor crossing on the 'curves' (tracks EE1/2, FF1 / 2 and CC1/2, DD1/2 as shown on the OBE 5 diagram provided and the 11 drawings). What problems would there be for RBC-RBC handovers at these locations? This relates not only to RBCs from the same supplier but also to RBCs from different suppliers. Please note it is possible to start up trains at these locations. Furthermore the flank protection and the emergency stop functionality used (CES) is an important factor, see also issue K for question 5.1.2. Another question is what measures are available for RBC-RBC handovers to mitigate the risk of a delay in a CES or SMA as a result of the train connection time?

3 Further process

3.1 Planning - Plan preparation phase for the ERTMS programme

During the market consultation the market parties asked how the Fyra enquiry would affect the planning of the ERTMS programme. The Programme would like to refer to the cover letter to the third ERTMS progress report, in which the state secretary for Infrastructure and the Environment provides further information on this matter³.

'As discussed during the General Consultation of 17 June 2015, the planning and the plan preparation phase have been revised. This is due to the delay in appointing staff in the start-up phase and to ensure the requisite sequentiality between the Fyra enquiry and the ERTMS procurement and contracting strategy. In view of the period of time between the presentation of the results of the enquiry and the government's response, and the incorporation of the conclusions and lessons learned into the strategy, the strategy is anticipated to be submitted to the House of Representatives of the States General in the second quarter of 2016. Considering that it is of vital importance to carefully factor in all aspects of the strategy into the project decisions and taking account of the occurrence of potential risks, it follows that the project decisions will be deferred by four to six months.'

In the 'Response to the questions on the third ERTMS progress report and the dual signalling pilot' of 14 January 2016, the state secretary for Infrastructure and the Environment provided the following information⁴:

'In the third progress report on the ERTMS programme the House of Representatives of the States General was informed of the importance of carefully considering the recommendations by the Parliamentary Committee on the Fyra enquiry and incorporating these when developing and implementing the Programme. It was indicated at that time that this would have consequences for the planning. The government's position on the enquiry is expected to be announced in spring 2016, but it has become quite clear that a number of substantive recommendations may be relevant to the ERTMS programme. A concrete example is the recommendation to establish a comprehensive, integral testing company which, for the time being, had been planned only in a limited form and size. I believe it is essential that the Programme takes sufficient time to follow up on the recommendations and the government's response.'

³ <https://www.rijksoverheid.nl/documenten/rapporten/2015/10/01/derde-voortgangsrapportage-programma-ertms>

⁴ <https://www.rijksoverheid.nl/documenten/kamerstukken/2016/01/14/beantwoording-vragen-over-derde-voortgangsrapportage-ertms-en-de-pilot-dual-signalling>

Appendix 1: Rules of play

The following conditions set by the ERTMS Programme apply to this market consultation:

- The market consultation expressly forms no part of any procurement procedure that may be conducted.
- It should be stressed that no rights may be derived from the information provided for the purpose of the market consultation.
- Participation does not give participants a privileged position in any procurement procedure that may be conducted, nor will participation lead to exclusion from such a procedure.
- The nature of the market consultation is without obligation and no rights may be derived from the insights arising from the market consultation.
- The target audience of this market consultation is limited to private sector market parties who may be engaged as tenderers and/or subcontractors during the preparatory phase / implementation phase of the ERTMS Programme. The parties excluded from this market consultation are public sector parties, interest groups, private individuals, the press and knowledge institutions.
- All the information handed out during the market consultation by the Programme and the participants' list will be **published**;
- The Programme will draw up a report of plenary meetings, which will be **published**.
- The Programme will draw up a meeting report for every individual market consultation meeting. All the important points, solutions and the information provided to the market will be recorded in this report. This report will **not be published** and will be treated as confidential.
- The Programme will draw up a **comprehensive report summarising the main points** for every individual market consultation meeting, which will be **published** (anonymised excluding confidential business information).
- The language of communication for the market consultation is English, but it may change to Dutch if desired
- All communication relating to the market consultation and reply forms should be sent to this e-mail address: marktconsultaties@ERTMS-nl.nl.
- Participation in the market consultation is on a voluntary basis; no allowance will be granted for participation, nor will an allowance be provided for the costs arising from participation.