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Introduction to major CCS-systems modernization procurement 2020-2024

An open information session for potential participants in major CCS-tender and related sub-tenders

25th February 2020

V. 2502-20D

AGENDA

10.00 - 11.00 Registration, coffee

11.00 - 11.15 MÄRT EHRENPREIS – Introduction of AS Eesti Raudtee and developing guidelines

11.15 - 11.45 JUKKA NIEMELÄ (WELADO OY) – Scope of works, schedule and requirements

11.45 - 12.00 JUSSI NIEMINEN (PROXION PLAN OY) – Technical solution overview

12.00 - 12.15 GEA VENDEL – Tender rules

12.15 - 12.45 Open discussions

Coffee break

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Introduction

Presented by:

Märt Ehrenpreis

Head of the Telecommunication and Signalling Systems Agency

Presentation rules

- Everything spoken today is informative and under no circumstances binding to contracting authority
- Contracting authority can not reveal any specific details (i.e. estimated value or any other information that would give any advantage to participants of information day for preparing the tender)
- Please make sure You have confirmed Your participation on information day with Your signature and check if Your e-mail address on registration sheet is correct
- All participants will get presentation via e-mail after the information session (within couple of days)
- Information session will be recorded

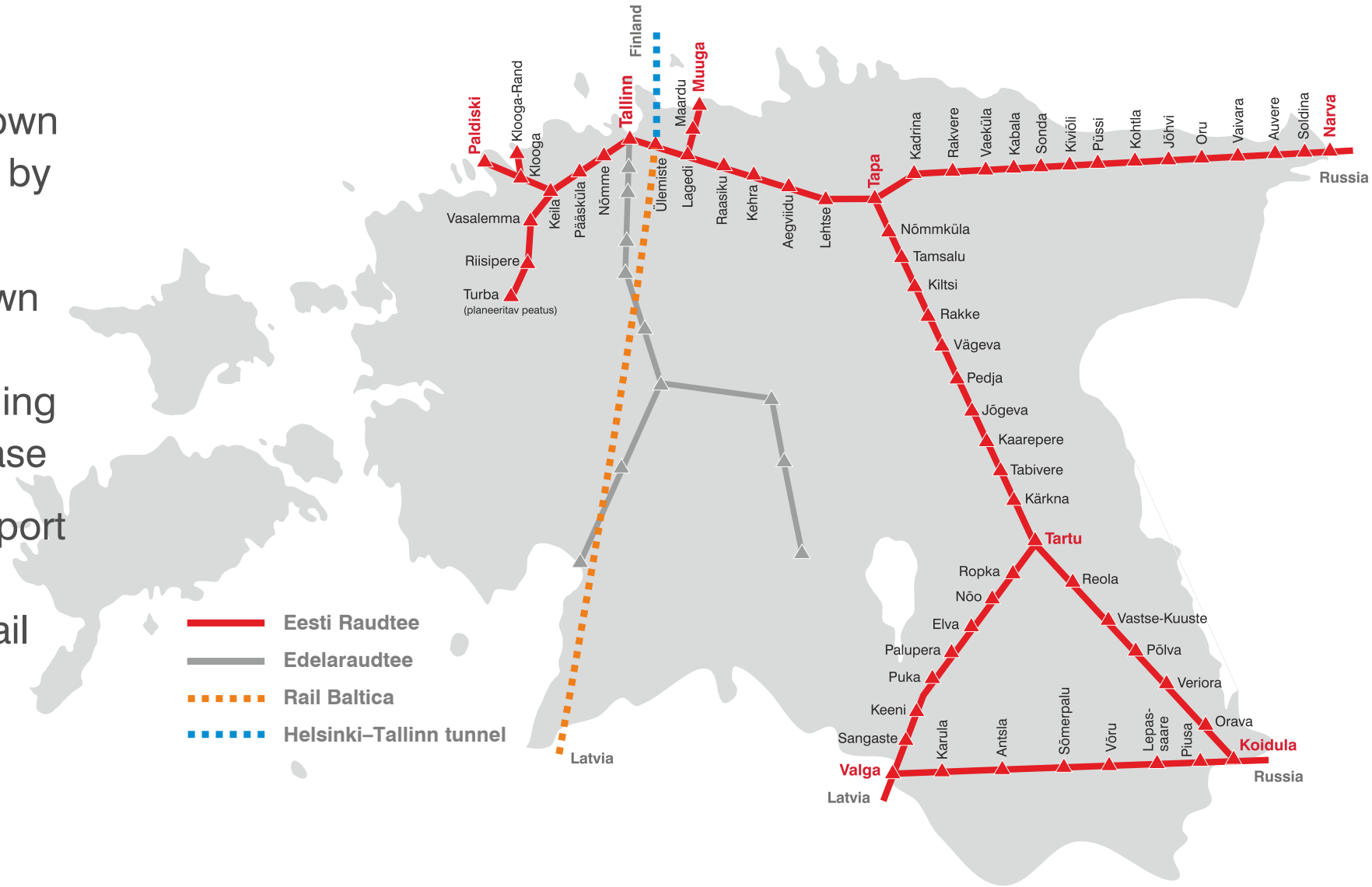
Estonian Railways

- Estonian Railways is a state-owned company, operating since 1870 and responsible for railway administration related tasks
- The company ensures smooth operation, management and maintenance of the railway infrastructure
- Furthermore, the Company:
  - responsible for efficient traffic supervision and safety of the railway
  - operates as the region's railway competence center

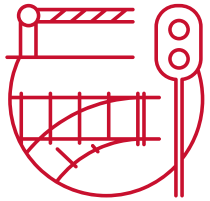
RESPONSIBLE BUSINESS INDEX GOLD LEVEL 2019

Railway infrastructures and IM’s in Estonia

- The rail networks shown on the map are used by public transport
- The rail network shown with dotted line is currently in the planning and construction phase
- In addition there are port and mining railways linked to the public rail network



Basic network and maintenance information



Points: **1195 pcs**

Signals: **2080 pcs**

Automatic block lines: **480 km**

Level crossings: **152 pcs**

Hot-Boxes: **29 pcs**

Network: **1219 km**

Mainlines: **795 km**

Electrified track: **130 km**

Platforms: **129 pcs**

Stations: **61 pcs**

Maximum speed: **120 km/h**

Employees ca: **700**

ISO 9001:2018

ISO 14001:2018

Development guidelines 2020 - 2028

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Modernization of railway CCS-systems and related subsystems 2019 - 2027

Stage 0 (2019 - 2020)
Preparation of technical concept and project documentation

Stage 1 (2020 - 2024)
Modernization of signalling system and creation of conditions for the deployment of ERTMS

Stage 2 (2021 - 2024)
Modernization of signalling system and creation of conditions for the deployment of ERTMS

FOUNDATION

Stage 3 (2025 - 2027)
Deployment of ERTMS (ETCS L1 FS / LS)

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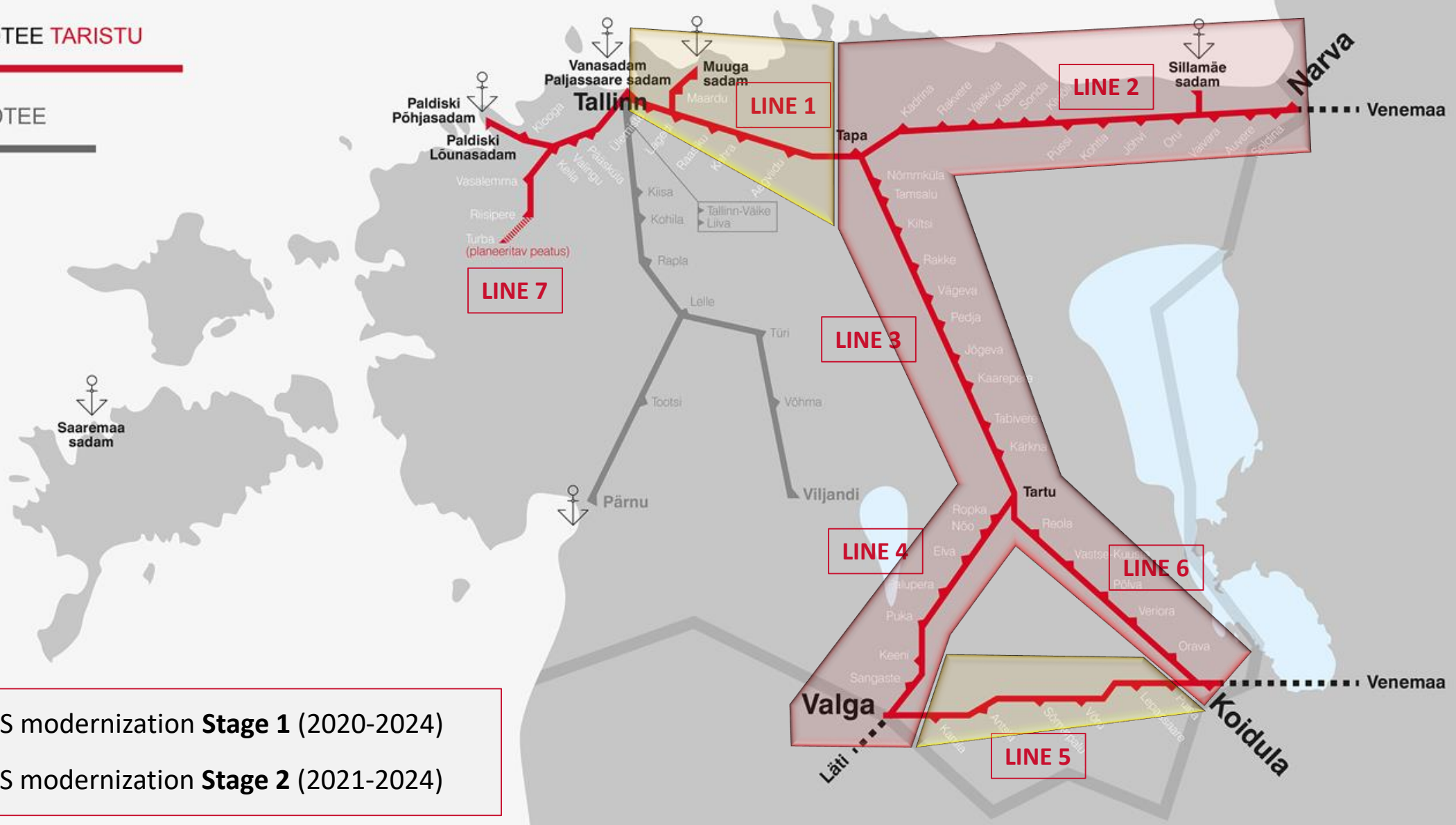
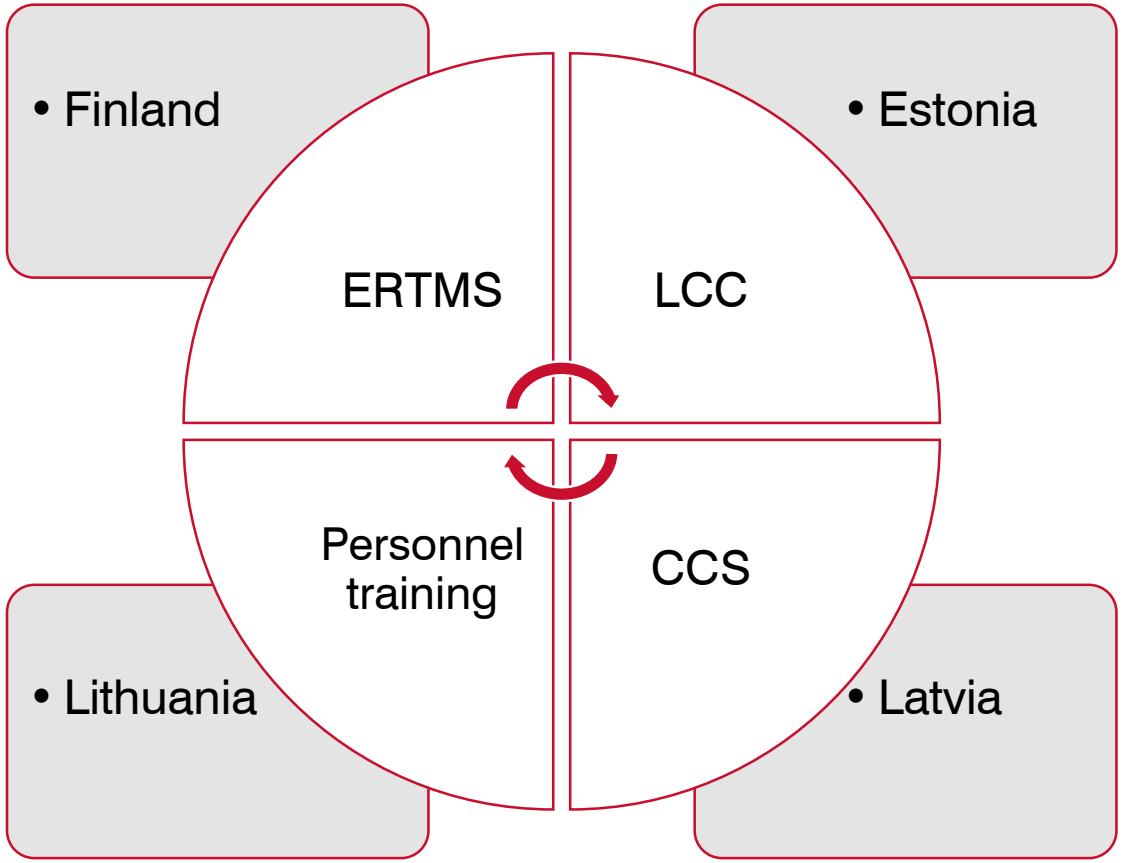
EDELARAUDTEE



- CCS modernization **Stage 1** (2020-2024)
- CCS modernization **Stage 2** (2021-2024)

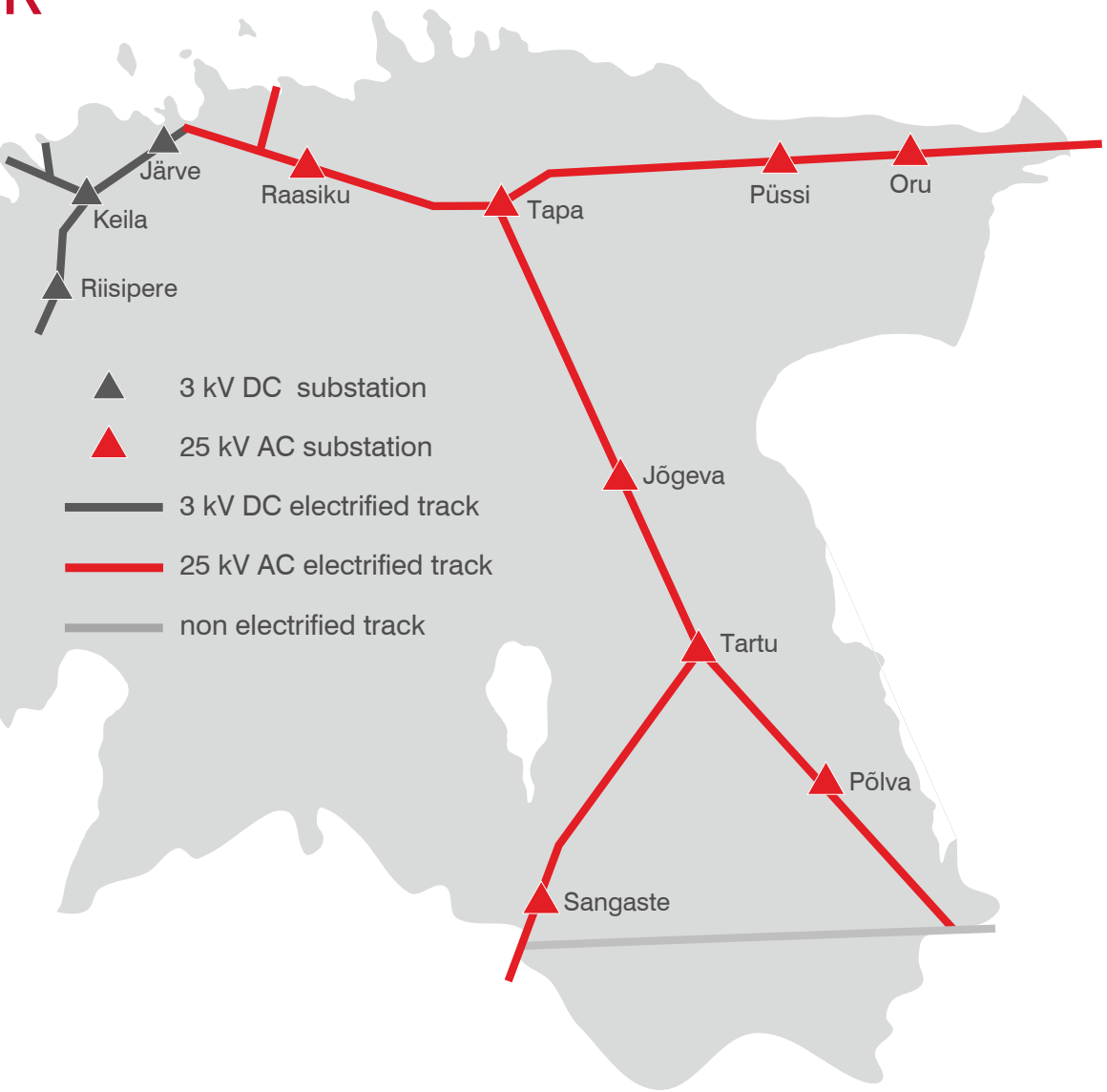
Cooperation between infrastructure managers in the technology sector on the 1520 ... 1524mm network

- The harmonization of Finnish and Baltic region CCS-systems and related subsystems is under consideration
- Depending on the development and financing of the ERTMS systems introduction, it is also possible to implement a more advanced ERTMS system (ERTMS L2 or L3) on 1520…1524mm network



Electrification of the rail network 2020 - 2028

- Line voltage: 25 kV AC
  (West from Tallinn 3 kV DC)
- Power supply for
  substations: 110 kV network
- Design speed of the
  electrified line: 160 km/h
- Stations: 47 pcs



CCS – system tender 2020 Scope of Works, Schedule and Requirements

Presented by:

Jukka Niemelä

Area Manager & Business Director, The Baltics – Welado Oy

www.welado.fi

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Why do we need this procurement?

- Most of the signalling systems are old relay systems which no longer meets today's requirements (will be dismantled during CCS project)
- Safety needs improvement
- Reliability, Availability and Maintainability need improvement
- Capacity needs improvement
- LCC needs improvement
- ALSN is not standardized by EC/ERA
  - ERTMS/ETCS is a system that is widely used in Europe, the introduction of which is funded at European level
  - ALSN expertise and equipment availability is not guaranteed
- EU directives and TSIs
- Preparation for future needs

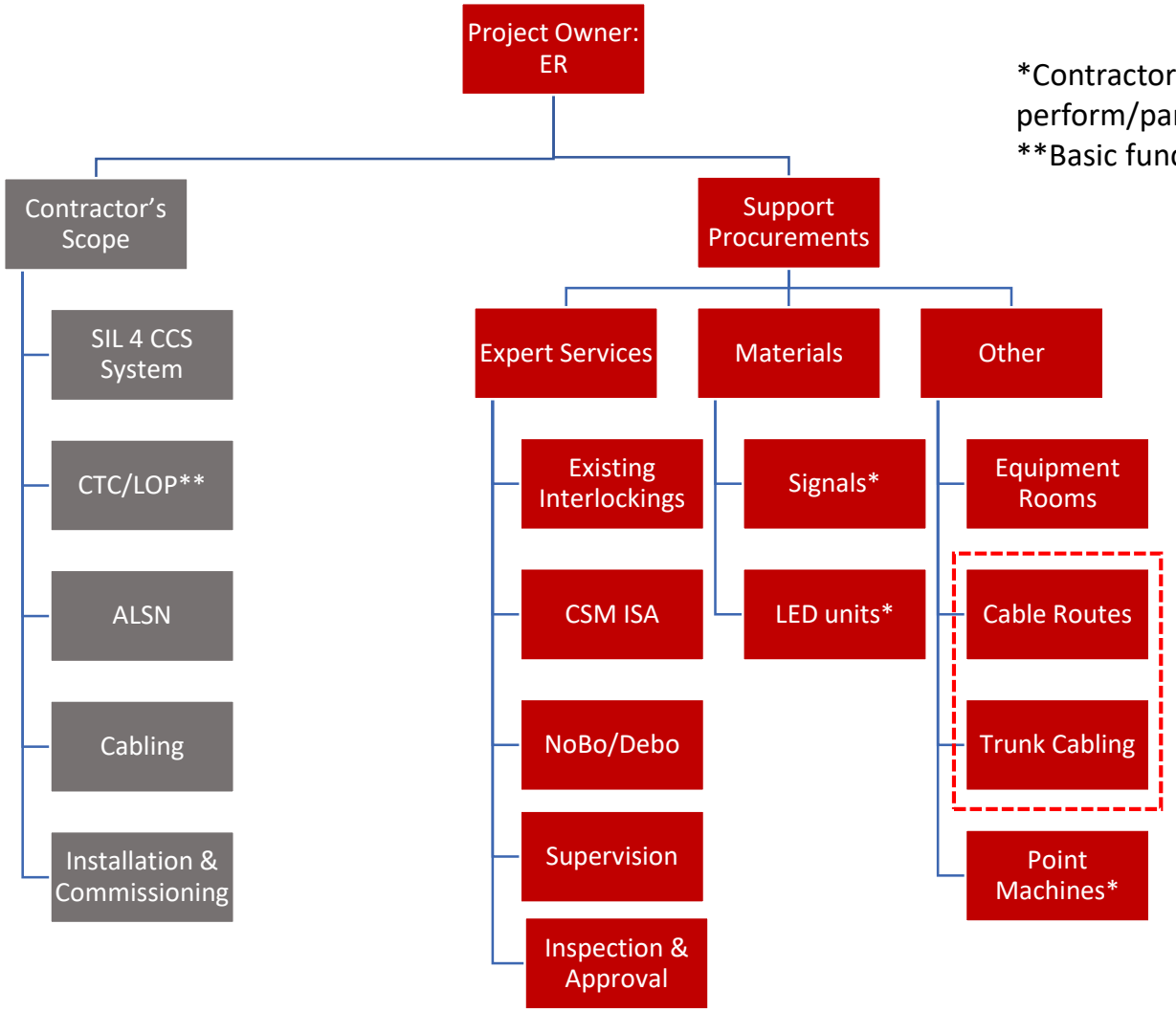
Main Guidelines

- CCS system functionality = current basic functionality
  - Signals
  - Train routes
  - Locking tables etc.
  - Necessary improvements for future needs
- System safety level = SIL4
- CCS Contractor delivers the system
- ER is responsible for support procurements & civil works
- Maintenance and spare parts unification
- Close co-operation with TTCMS and other projects is a requirement
- Connectivity to TTCMS on server layer is a target (TTCMS/CCS interfacing)

Project and Technical Interfaces

- Track electrification project
- FOC project
- Level crossing systems project
- Rail Baltica project (Muuga, Ülemiste)
- CCS systems from other vendors
- Timetabling, Traffic Control and Management System (TTCMS)
- CCS subsystems
- Projects on ER’s responsibility

Scope of Works



*Contractor will install and perform/participate FAT/SIT/SAT tests
**Basic functionalities due to TTCMS project

Turnkey delivery with electrification, heating & cooling

All excavation works:
- Signal foundations
- Cabinet foundations

Point machine installation by ER, electrical installation by Contractor-B

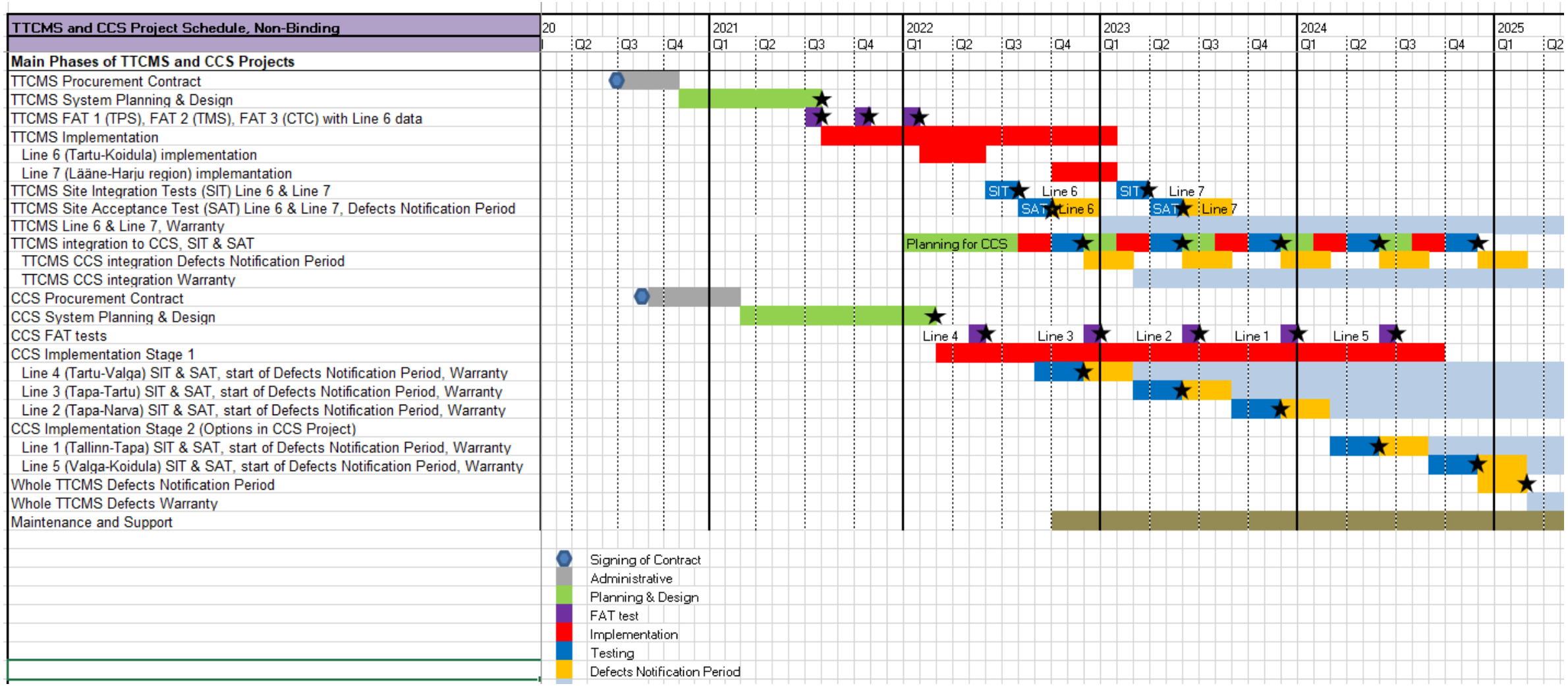
Procurement Scope of CCS

- A SIL 4 level CCS system on a Line-basis, including indoor and outdoor equipment with cabinets
- ALSN and track circuits/axle counters
- All installation and commissioning, including ER’s railway specific materials
- Cabling in ready-made cable routes on stations
- A CTC/LOP for train dispatchers
- Participation in FAT testing, conducting of SIT testing and participating in SAT testing
- Training for dispatchers and maintenance

Schedule Guidelines

- CCS RFT in Q2, contracts in Q3…Q4
  - FAT1 in 12 months from signing (Line 4)
  - SAT in 24 months from signing (Line 4)
- Support procurements Q2…Q3

Schedule Guidelines



Main Applicable Standards

- EVS-EN 50126 (The Specification and Demonstration of Reliability, Availability, Maintainability and Safety)

- EVS-EN 50128 (Communications, signaling and processing systems – Software for railway control and protection systems)

- EVS-EN 50129 (Communication, signaling and processing systems. Safety related electronic systems for signaling)

Stage 1 – Modernization of CCS System and Preparation for ERTMS/ETCS

- **Tenderers' minimum requirements are:**
  - A proven concept of SIL 4 CCS system delivery with references
  - A system model available for the next 15 years
  - Product lifecycle 25 years
- **The number of Contractors for Lines 4, 3, and 2 not yet decided**
  - Preliminary suggestion: 3+1, 4+5 and 2 (spare parts, maintenance, interfaces)
  - Funding of Lines 1 and 5 open, will be options in the Contract(s)
- **Tender evaluation will be based on price and quality, main emphasis on:**
  - Reference project(s)
  - Project organization & key persons
  - Lifecycle Control Management Plan
  - Project schedule and project plan
- **Deadline for tenders in 8/2020, published at the latest 6/2020**
- **Contract signing latest 11/2020**

Requirements and Initial Data

- **As a minimum, ER will provide the Tenderers with the following documentation:**
  - EVIR (Eesti Vabariik Interlocking Requirements); technical specification with annexes such as single and double line drawings, locking tables, indications and commands, description of the signalling system, description of ALSN etc.
    - The Contractor has the duty to suggest any improvements to the requirements during the project
  - Project target schedule
    - The Contractor has the duty to deliver a detailed project schedule and project plan for evaluation as a part of Tender documentation
  - List of standards and applicable laws etc.
- **System must operate with**
  - SIL 4 LED light units available on the market
  - Current and other point machines available on the market

What Next?

- **RFI will be sent to participants**
  - Open interface for TTCMS system direction and LED signaling
  - Point machines
  - Interlocking to interlocking (between different system vendors)
  - Train detection options with track circuits and axle counters
    - ALSN train protection before ETCS technology enters
    - ALSN system integrated with axel counters
    - ALSN system without isolating joints and drossel transformators

- **A workspace will be created for sharing contact information for co-operation purposes**
  - The Voluntary Networking Platform (VNP) will be created
  - You can place company references on the platform and indicate what kind of partner is needed or what is offered for the CCS project itself

CCS – system tender 2020 Technical solution overview

Presented by:

Jussi Nieminen

Project Manager, Proxion Plan Oy

www.proxion.fi

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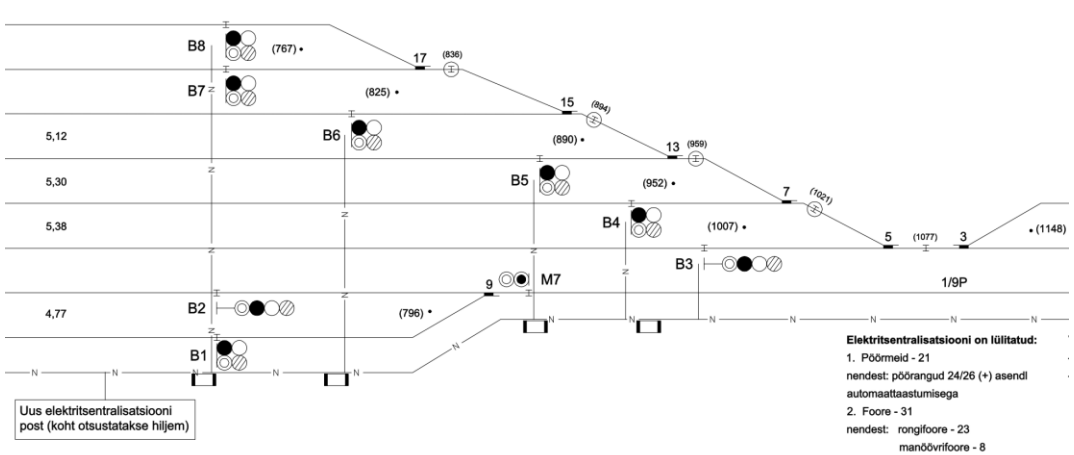
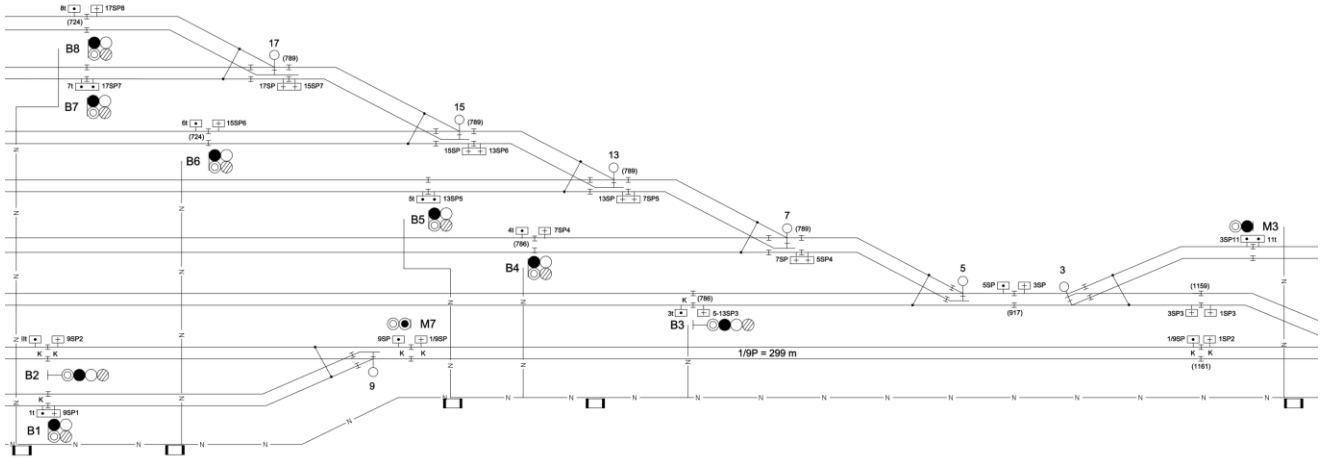
General

- Technical Specification has been created
  - 23 annexes from single line diagrams to a list of standards and CTC system description
- Signalling system design on two levels: system description as a single-line diagram and a more detailed track circuit design as a double-line diagram



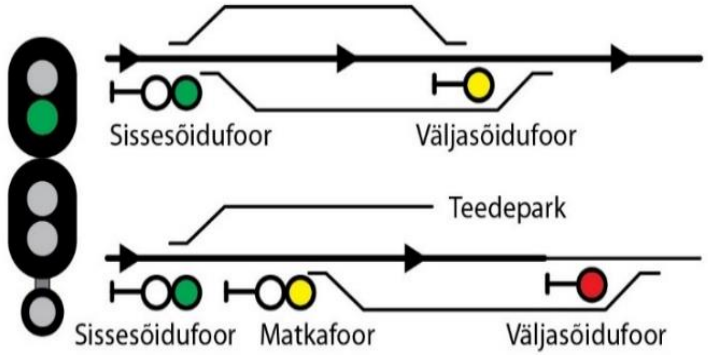


Technical solution overview

- Overlap of 60 metres have been introduced where possible
- Vacancy detection in the signalling system is designed with track circuits
  - Connections to ALSN
  - To ensure broken rail detection where necessary
  - A decision-making process is ongoing, regarding open-track sections between stations: innovative solution - axle counters system with independent ALSN-coding
- The most of the rail network has been designed with automatic line block system to ensure the safety, usability and capacity demands on each line (exception are Line 5 and 6)
- Signalling system solutions are designed to be as flexible as possible to leave room for the interlocking supplier to offer their expertise and find the best solutions for the equipment itself

Estonian interlocking requirements - EVIR

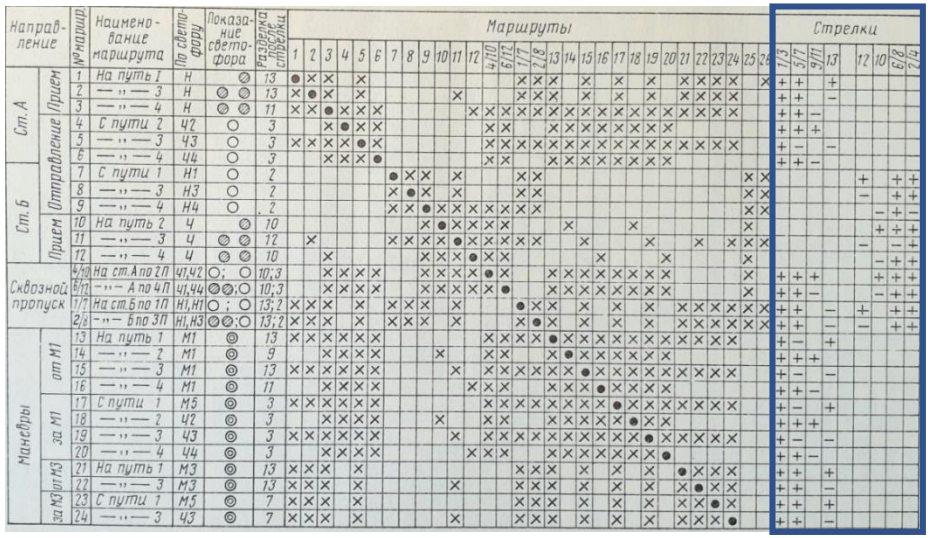
- Interlocking requirements for Estonia have been created
- EVIR consists of over 900 requirements along with the necessary commands, icons, HMI properties and system properties
- EVIR has been created as functional blocks for the best possible integrity so that different functionalities (as for example overlaps) can be separated if necessary



Signalling system design

- Signalling system design is based on the idea of improving the safety (for example the lengths of the overlaps) while keeping the level of service as high as possible
- Estonian signalling system with Estonian signals are to be used in the future also
- Locking tables have been created with ProVisu to ensure machine-readability

Nr.	Tüüp	Matka nimetus	Rongifoor	Sihtkoha element	Suund	Matka pöörangud ja asendid (+/-)	Külgkaitse element	Rongifoori näit	Hoiatusfoori näit
1	RL	A2-Kivíõli	A2	Kivíõli	Kohtla → Kivíõli	2(-)	4(-)	Proceed, Expect Proceed / Proceed, Expect Stop	-
2	RL	A3-Kivíõli	A3	Kivíõli	Kohtla → Kivíõli	8(-), 6(-), 4(+), 2(+)	A2, A4, A5, M4	Proceed, Expect Proceed / Proceed, Expect Stop	-
3	RL	A4-Kivíõli	A4	Kivíõli	Kohtla → Kivíõli	8(+), 6(-), 4(+), 2(+)	A2, A3, A5, M4	Proceed, Expect Proceed / Proceed, Expect Stop	-
4	RL	A5-Kivíõli	A5	Kivíõli	Kohtla → Kivíõli	6(+), 4(+), 2(+)	A2, A3, A4, M4	Proceed, Expect Proceed / Proceed, Expect Stop	-
5	RM	A-A2	A	A2	Kohtla → Kivíõli	1(+)	3(+)	Proceed, Expect Proceed / Proceed, Expect Stop	-
6	RM	A-A3	A	A3	Kohtla → Kivíõli	1(-), 3(-), 5(+), 7(+)	19(-), B4, B2, B5	Proceed with limited speed, Expect Stop / Proceed with limited speed, Expect Proceed or Expect Proceed with limited speed	-
7	RM	A-A4	A	A4	Kohtla → Kivíõli	1(-), 3(-), 5(+), 7(-)	19(-), B2, B5, B3	Proceed with limited speed, Expect Stop / Proceed with limited speed, Expect Proceed or Expect Proceed with limited speed	-
8	RM	A-A5	A	A5	Kohtla → Kivíõli	1(-), 3(-), 5(-)	19(-), B4, B2, B3	Proceed with limited speed, Expect Stop / Proceed with limited speed, Expect Proceed or Expect Proceed with limited speed	-
9	RL	B2-Kohtla	B2	Kohtla	Kivíõli → Kohtla	1(+)	3(+)	Proceed, Expect Proceed / Proceed, Expect Stop	-
10	RL	B3-Kohtla	B3	Kohtla	Kivíõli → Kohtla	7(+), 5(+), 3(-), 1(-)	19(-), B4, B2, B5	Proceed, Expect Proceed / Proceed, Expect Stop	-
11	RL	B4-Kohtla	B4	Kohtla	Kivíõli → Kohtla	7(-), 5(+), 3(-), 1(-)	19(-), B2, B3, B5	Proceed, Expect Proceed / Proceed, Expect Stop	-
12	RL	B5-Kohtla	B5	Kohtla	Kivíõli → Kohtla	5(-), 3(-), 1(-)	19(-), B4, B2, B3	Proceed, Expect Proceed / Proceed, Expect Stop	-
13	RM	B-B2	B	B2	Kivíõli → Kohtla	2(-)	4(-)	Proceed, Expect Proceed / Proceed, Expect Stop	-
14	RM	B-B3	B	B3	Kivíõli → Kohtla	2(+), 4(+), 6(-), 8(-)	A2, A4, A5, M4	Proceed with limited speed, Expect Stop / Proceed with limited speed, Expect Proceed or Expect Proceed with limited speed	-
15	RM	B-B4	B	B4	Kivíõli → Kohtla	2(+), 4(+), 6(-), 8(+)	A2, A3, A5, M4	Proceed with limited speed, Expect Stop / Proceed with limited speed, Expect Proceed or Expect Proceed with limited speed	-
16	RM	B-B5	B	B5	Kivíõli → Kohtla	2(+), 4(+), 6(+)	A2, A3, A4, M4	Proceed with limited speed, Expect Stop / Proceed with limited speed, Expect Proceed or Expect Proceed with limited speed	-
17	MM	A2-BP	A2	BP	-	2(-)	-	Shunting Proceed	-



ERTMS/ETCS Level 1 (LS/FS)

- Preparing for ERTMS/ETCS level 1 by moving forward to modern SIL4 level microprosessor interlocking
- Implementation methods will be discussed later in the project
- Breaks in train traffic will have to be kept to a minimum
  - ALSN in use as long as ETCS is implemented and the rolling stock is equipped with the necessary ETCS-equipment

Public Procurement process

Presented by:

Gea Vendel

Manager of Procurement Department

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Useful links for participating in railway tenders

- Estonian Public procurement register:
  https://riigihanked.riik.ee/rhr-web/#/
- (will be duplicated in the EU Tenders Electronic Daily – Supplement to the Official Journal):
  https://ted.europa.eu/TED/browse/browseByMap.do
- Estonian Railways Ltd website (news about important tenders):
  http://www.evr.ee/et/arikliendile#hanked-ja-muugikuulutused
- Estonian Technical Regulatory Authority:
  https://www.ttja.ee/en
- Recognition of foreign professional qualifications in Estonia:
  https://www.eesti.ee/en/work-and-labor-relations/working-bases/recognition-of-foreign-professional-qualifications-in-estonia/

Tender rules – submitting the tenders

- Public procurement shall be announced via Public Procurement Registry - https://riigihanked.riik.ee/.

- Please register yourself to the registry, attached to the procurement. There are video-tutorials on how to use the registry. For further technical assistance, please turn to procurement registry support (register@riigihanked.riik.ee ; phone +372 611 3693, +372 611 3703 (on business days 9:00–12:00 ja 13:00–15:00).

- If you have questions about the tender documents, please send them **only** through procurement registry (not by any e-mail or phone).
  Notifications about Q&A given will go to the e-mail addresses of registered participants of the tender. However, all Q&A will become public after an answer has been given.

- After the deadline of submitting tenders has passed, contracting authority will open tenders electronically. The evaluated values (prices) of the tenders shall become visible to all participants of the tender.

Tender rules – reviewing the tenders & reaching the contract

- After opening the tenders, the procurement committee shall analyse each submitted tender to make sure they comply with all requirements.
- If needed, specifying/clarifying questions (about already submitted data) may be asked from a tenderer. NB! If any required substantial data/documents is missing from the tender, then it cannot be submitted later, after the tender deadline.
- After all tenders have been analyzed, the decision shall be formed by the committee and proposed to the Management of Estonian Railways Ltd. After the Management's decision, participants shall be notified of the results of the tender.
- Then, there is a standstill period of 14 days. Also, concluding a contract in this value must be approved by the Supervisory Board of Estonian Railways Ltd. Therefore, concluding the contract will probably be approximately in 2-3 months after publishing the results.

Open discussion

THANK YOU !

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