

ECITL'11



Intermodal Operator SeaRail

SeaRail Oy – Berndt Ahlfors

SeaRail

Agenda

1. SeaRail Oy
2. Case objectives and Requirements
3. How the Intelligent Cargo is applied
4. Pilot application
5. Expected and “To-Be” benefits
6. Conclusions



SeaRail Oy

Intermodal transports: Railway (or truck) – Train ferry – Railway (or truck).
Owned by the state Railways in Finland and Sweden.

- Daily train ferry connection between Stockholm and Turku since 1989.
- A modern wagon fleet: covered, open and tank-wagons.
- The use of bogie changeable wagons (i.e. special wagons) allows for swift connection without reloading.
- Indoor reloading (between European and Finnish/Russian wagons or from wagon to lorry).
- Environmentally friendly transports.
- Facts about SeaRail: employees 36, turnover 21 million euro, transported volume half a million tons.
- Almost 25% distributed by truck. Increasing.

The logo for SeaRail, featuring the word "SeaRail" in a bold, blue, sans-serif font. The letter "S" is stylized with a white arrow pointing to the left, and the letter "R" has a white arrow pointing to the right.

Case objectives

- The core business for SeaRail is the effective utilisation of the wagon fleet, both long-term and case-by-case leased wagons.
- Today, the main logistics issue is the lack of information about wagon movements.
- For this reasons, the IC application in this pilot aims to collect exact real-time information about the wagons movements in order to perform selected IC functionalities.

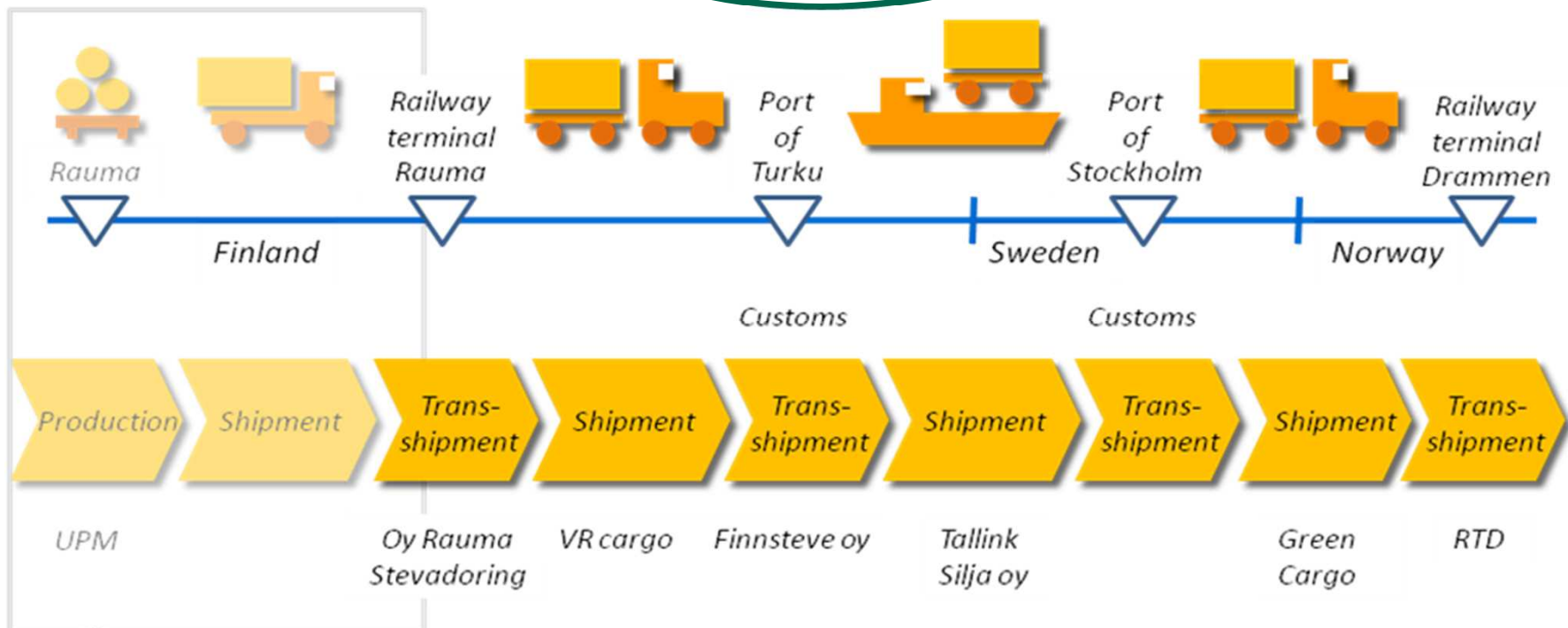


How the Intelligent Cargo is applied

- Wagon identification
- Automated wagon selection for the transport order
- Individual Transport parameters

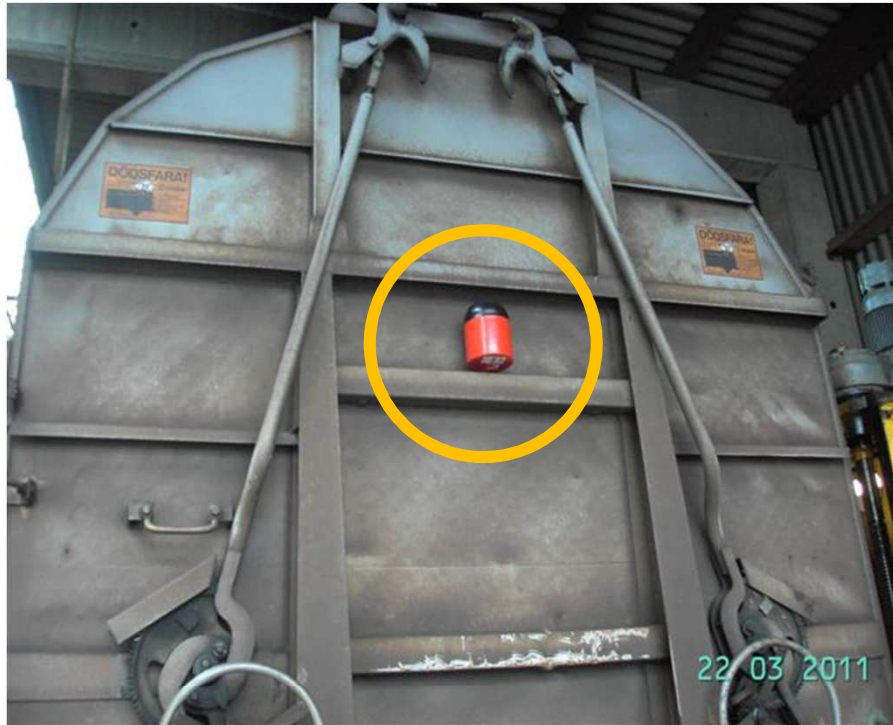
- G-force recording
- G-force notifications
- Wagon positioning
- ETA (Estimated Time of arrival)
- Wagon status updates (reserved/unreserved, loaded/unloaded)

- Calculation of KPI (Key Performance Indicators)



Pilot application

- Smart sensors



GPS & G-Shock

Axle counters



Pilot application

- User interface with pop-up alerts

The screenshot displays the SeaRail web application interface. The top navigation bar includes links for Mainpage, Tasks, Base registers, Alerts (), and End session Seairail. The main content area is titled "Wagons planning" and features a "Component map" section with a tree view containing items like Vaunukuormat, Vaunut, Virtuaalikuorma, Avoimet tilaukset, Avoimet tilausrivit, and Kartta. Below this is a form for "Open transport orders" with various input fields and a search button. A table below the form lists transport orders with columns for Ordernumber, Order sequence number, Order date, Distance (km), Condition typecode, Responsible user, Orderer's ordernumber, and Orderer's customer order. A "Transportorder lines" section is also visible at the bottom.

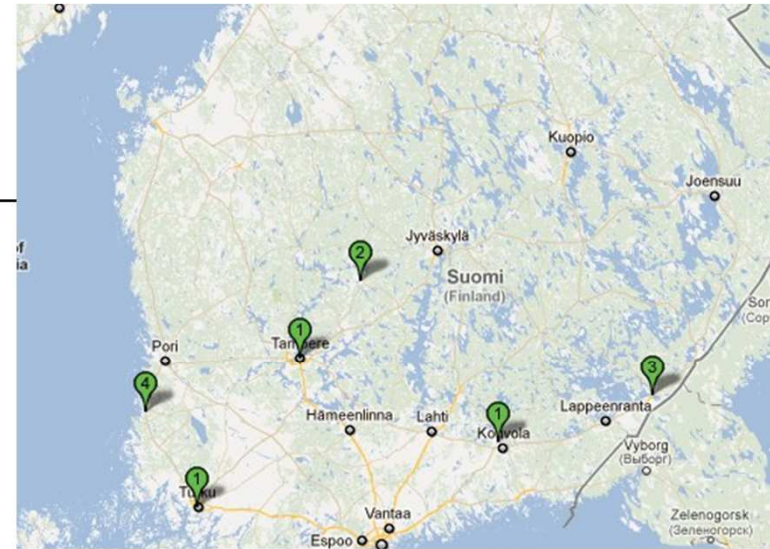
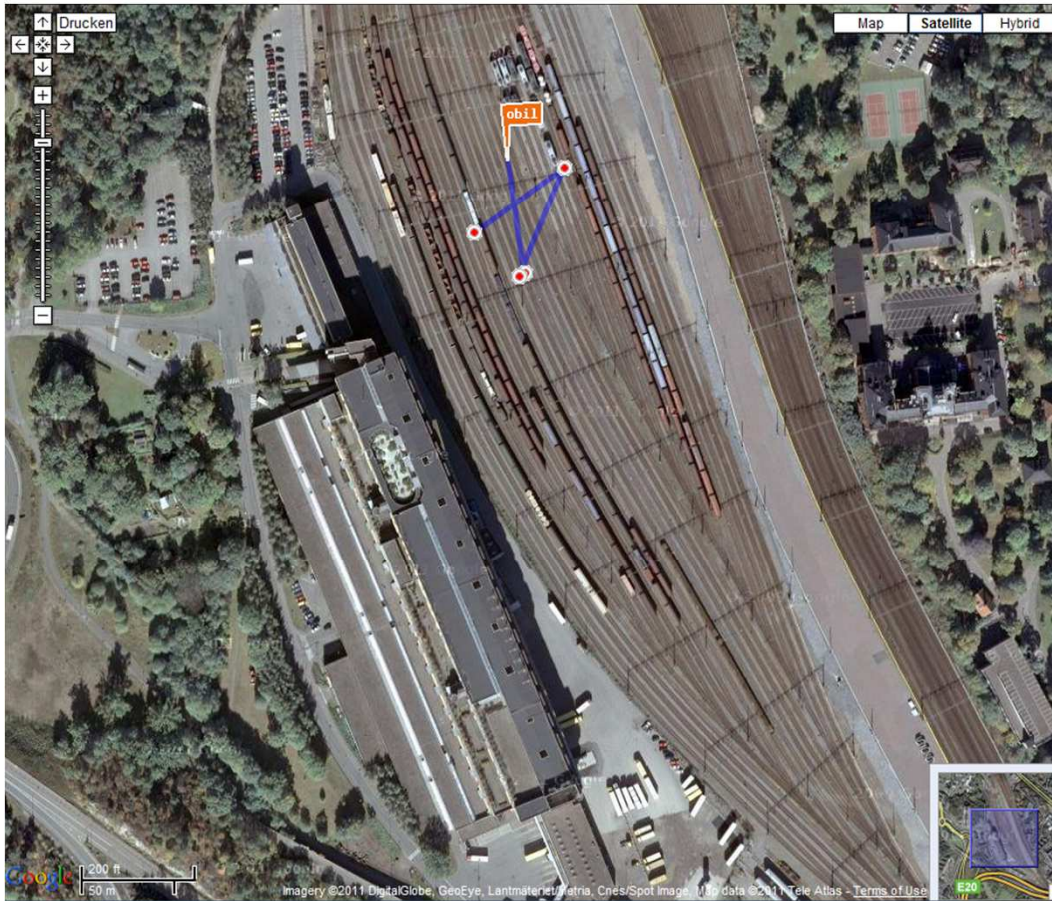
A pop-up alert window is overlaid on the bottom right of the interface. It has a pink header with an exclamation mark icon and the word "Alerts". The alert contains four messages, each preceded by a red warning triangle icon:

- ⚠ Wagon W1234 temperature is too low 26.10.2010
- ⚠ Wagon W-ABC humidity is too high 26.10.2010
- ⚠ Wagon W99AA max. G-force count is exceeded 26.10.2010
- ⚠ Wagon WEERR-1 battery level is too low 26.10.2010

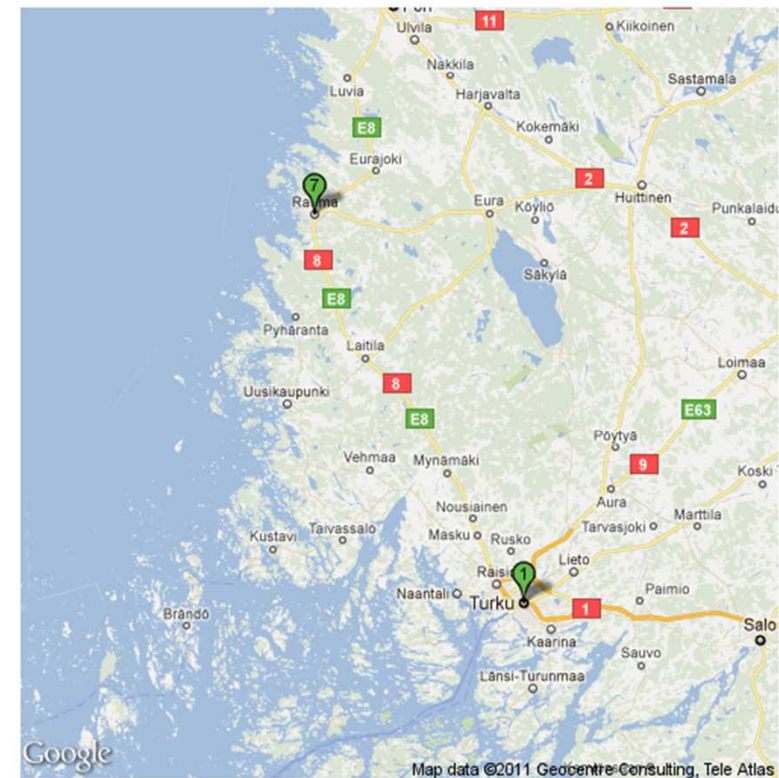
The browser's taskbar at the bottom shows the Internet Explorer logo, the text "Internet", and a 100% zoom level.

Pilot application

- Wagon follow-up



Available wagons on 2011-10-03 10:54:00



Pilot application

- Sample of measurements of KPI calculations

OrderNo	Depart	Arrival	LoadDate	Dept.Date	NavMaster	ST	Dest	ETA	NavMaster	TT	Diff.	Remark
3228458	FI RAUMA		28.02.2011	02.03.2011		0	NO DRAMMEN	09.03.2011				No measurements
3228865	FI RAUMA	24.03.2011 03:59:14	26.03.2011	28.03.2011	28.03.2011 23:58:57	4,83	NO DRAMMEN	01.04.2011	01.04.2011 09:59:14	3,42	0	
3229094	SE VALLVIK	07.04.2011 11:59:13	07.04.2011	11.04.2011	11.04.2011 06:58:44	3,79	FI PENIZEVICHI	15.04.2011	15.04.2011 09:59:13	4,13	0	PENIZEVICHI = TURKU ?
3229285	FI RAUMA	16.04.2011 03:59:14	18.04.2011	20.04.2011	20.04.2011 16:58:42	4,54	NO DRAMMEN	27.04.2011	27.04.2011 09:58:48	6,71	0	
3229451	SE UDDEVALLA	29.04.2011 08:59:15	02.05.2011	03.05.2011	03.05.2011 14:58:41	4,25	FI TURKU	05.05.2011	06.05.2011 07:59:12	2,71	1	
3229605	FI RAUMA	11.05.2011 03:58:45	09.05.2011	11.05.2011	11.05.2011 18:03:43	0,59	NO DRAMMEN	18.05.2011	18.05.2011 09:59:26	6,66	0	At loading date, wagon was in Turku
3230032	SE MÖNSTERÄS	16.06.2011 10:58:45		17.06.2011	17.06.2011 09:58:44	0,96	FI MÄNTTÄ	21.06.2011	22.06.2011 11:03:44	5,05	1	missing
3230215	FI RAUMA	01.07.2011 04:59:14	02.07.2011	04.07.2011	04.07.2011 14:59:14	3,42	NO DRAMMEN	08.07.2011	15.07.2011 13:03:44	10,92	7	<- caused by? 4 days Hallsberg, Tissaren & 1 day Oslo
3230445	SE MÖNSTERÄS	22.07.2011 11:59:13	25.07.2011	25.07.2011	25.07.2011 10:58:45	2,96	FI MÄNTTÄ	28.07.2011	29.07.2011 12:59:12	4,08	1	
3230553	FI SORSASALO	02.08.2011 18:59:13	05.08.2011	05.08.2011	05.08.2011 13:59:15	2,79	SE UDDEVALLA	16.08.2010	10.08.2011 08:58:56	4,79	-6	Paid trip with cargo but too soon => additional waiting time
3230634	SE UDDEVALLA	10.08.2011 08:58:56		17.08.2011	17.08.2011 14:58:50	7,25	FI TURKU	19.08.2011	18.08.2011 19:59:13	1,21	-1	missing
3230733	FI RAUMA	24.08.2011 03:59:14	23.08.2011	25.08.2011	26.08.2011 17:58:54	2,58	NO DRAMMEN	31.08.2011	30.08.2011 11:59:14	3,75	-1	Loading date before arrival
3230956	SE UDDEVALLA	07.09.2011 08:59:14	12.09.2011	13.09.2011	13.09.2011 14:59:12	6,25	FI TURKU	15.09.2011	14.09.2011 19:59:15	1,21	-1	new
3231071	FI TURKU	14.09.2011 19:59:15	21.09.2011	21.09.2011	21.09.2011 18:59:14	6,96	DK HOLMEGAARD	28.05.2010	26.09.2011 03:58:41	4,37	-2	new, destination Holmegaard = Ringsted ?
3231152	DK RINGSTED	26.09.2011 03:58:41		28.09.2011	28.09.2011 18:59:14	2,63	FI TURKU	04.10.2011	03.10.2011 19:59:13	5,04	-1	new
			193	80		59%						
	From	24-03-2011	(total days)	days empty	utilisation	rate						
	Until	03-10-2011										

59% utilisation



Benefits of the IC implementation (values/KPIs)

Performance Indicator	As-Is Value	To- Be value	Expected improvement
Average notification time in case of status change	Max 600 minutes Min 60 minutes	Max 30 minutes Min 5 minutes	Max: 95% Min: 91%
Average time spent for wagon selection	Min: 15 minutes Max: 20 minutes	Min: 1 minutes Max: 5 minutes	Min: 93% Max: 75%
Transport duration	One week	5-6 days	20%
ETA reliability	Not available	Available and above 90%	Better insight
Wagon usage rate	Based on Financial calculation (90-100%)	Based on actual load (57-59%)	Better insight



Conclusions

- The motivation for this project was new innovation after years in a world of ignorance and a lot of job.
- All parties involved in the transportation have now opportunity to get information about the transport in exact real-time.
- At this moment there is no possibilities to identify an individual paper reel or other cargo items.
- Future research
 - The challenge with this project is how to get every wagon in Europe installed with intelligent units?
 - At least every new wagon should be outfitted with these intelligent unit as a part of the wagon-body.
 - A common standard for the communication and hardware should also be agreed on.



Thank you for listening!



Requirements

- **The lack of information about wagon movements**
 - Currently:
 - Wagon movements can be followed only by third parties systems
 - No sensors in the wagons or system for alerts and notifications
 - Critical issues:
 - The available information is old and unreliable
 - The information is based on queries to various monitoring systems in various organizations
 - The information is unnecessary in normal circumstances, when no deviations occur
- **More effective usage of wagon fleet**
 - Currently:
 - Transport managers do not have operational wagon fleet management system
 - Manual system with risk of human errors
 - Critical issues:
 - Suitable wagon selection to transport need is a key issue for effective usage of the fleet
 - Efficient operative management of the transportation requires reliable up-to-date status information



Benefits of the IC implementation

