

ROLE OF INNOVATIVE TECHNOLOGIES

Coenraad Esveld

Session Moderator

ROLE of INNOVATION

- Cost reduction;
- Remain competitive with other modes of transportation;

Innovations are mainly in the following fields:

- Customers;
- Signaling;
- Power Supply;
- Rolling Stock;
- Infrastructure.

PRESENT INFRASTRUCTURE FOCUS

- Sustainability;
- Materials;
- Measurement and Control;
- Reduction of maintenance cost via Decision Support Systems;
- Life Cycle Cost and Asset Management;
- Wheel Rail Interface



EXAMPLE of TRACK INNOVATION



New standards for weld geometry

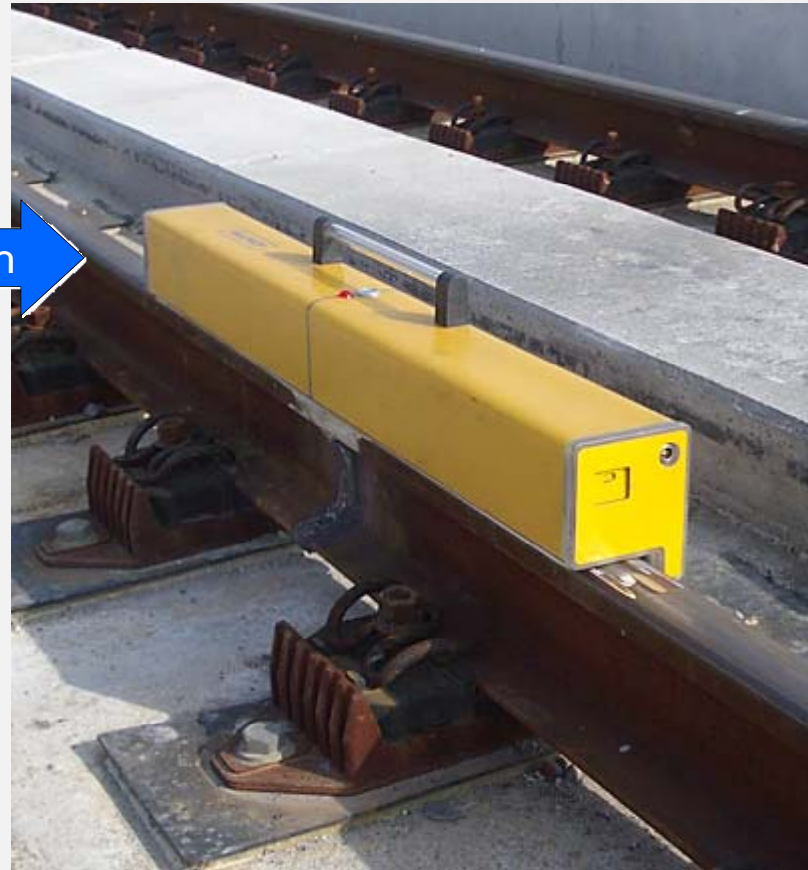
WELD STANDARDS BASED ON FORCE

$$F_{dyn} = Constant * v^2 * Inclination$$



Inclination: High-Speed < 1.0 mrad
Conventional < 1.8 mrad

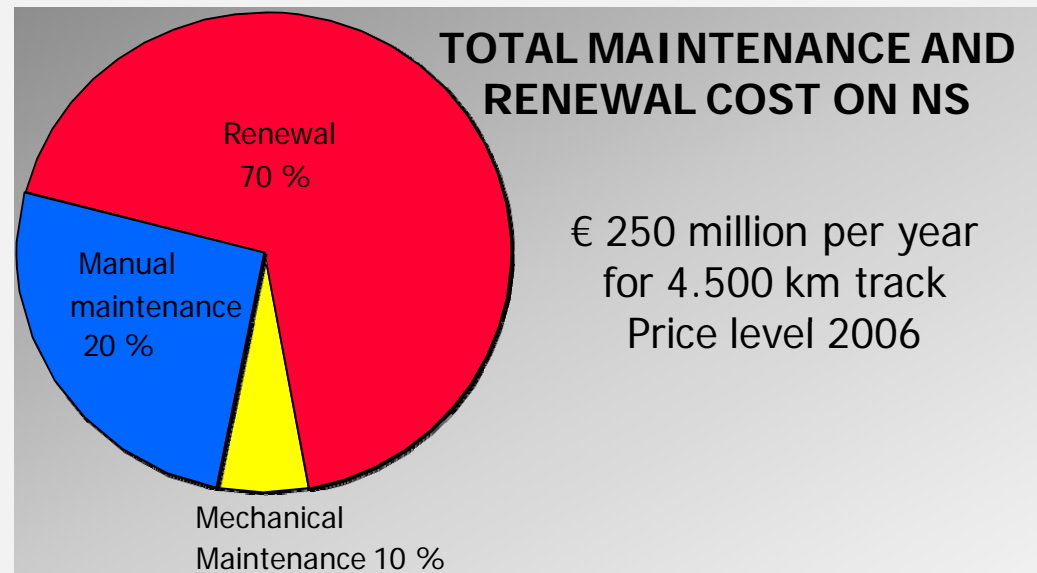
PRACTICAL IMPLEMENTATION



EXPECTED COST SAVINGS

Due to impact load reduction at welds:

- 10 – 20 % of annual maintenance budget;
- ProRail budget in The Netherlands:
~ € 250 mio for 4,500 single track;
- Savings: € 25 – 50 mio total,
or € 5 – 10,000
per km single track.



FORCE-BASED ASSESSMENT OF WELD GEOMETRY

Paper Title: Force-based Assessment of Weld Geometry



7th World Congress on Railway Research

June 4-8, 2006

Montréal, Canada

Best Paper Award
for Infrastructure
Winners

C. Esveld, M. Steenbergen

“Congratulations on your outstanding paper and contribution to the advancement of Railway Technology”



Roy Allen,
Chairman, Organizing Committee

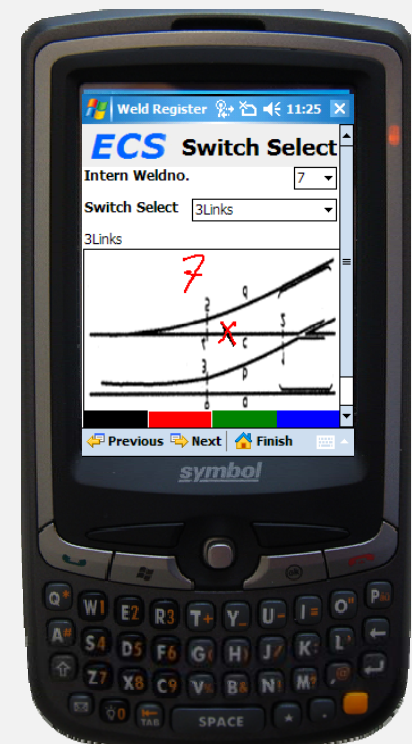
Semih Kalay
Chairman, Executive Committee

WELD REGISTER

- Weld info via Pocket PC;
- GPS coordinates, projection on Google Maps;
- Wireless data transmission via GPRS;
- Data stored in Access database;
- Selections per project, welder,;
- Generation of commissioning document for payment of contractor.

SERVER

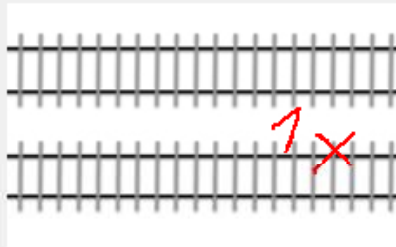
GSM/GPRS



ECS Weld Register Welding Company: ECS

Weld Info

ID	17
Unit ID	Coenraad
RP	RP4300
Time	16-8-2008 10:52:00
Project	WB
Welder	John Johnson
Service Code	abc
Track/Switch	ffffg
Track From	den B
Track To	Amd
Between KM	35
and KM	36
Switch Select	1Rechtstand



D:\ECS_Weld\SwitchBMP\17_1Rechtstand.bmp

Weld Input

Internal Weld No	1
Rail	UIC 54
Material	260-260 (900 MPa)
Situation	New-New
Joint	TW Narrow (SmwF)
Climate	Overcast
Rail L or R	L
Kilometer/Switch	123
Conformal	Y

Work Info

Level/Align/Tamp	None
Weld Tamped	Y
Vibration	N
Old Rails	N
CWR	Stretching
T_Rail Actual	29
T_Rail Neutral	25
Closure Weld	N
Fastenings Fixed	Y
WeldType	Other

File Info

D:\ECS_Weld\WeldXML\RP17_RP418420080614125150.xml

V 140 QIV 0.94 QIH 0.76



D:\ECS_Weld\CameraBMP\17_IMAGE_058.jpg

Remarks:

Waardenburg level crossing

Name: C. E

Signature:

D:\ECS_Weld\SignatureBMP\17_Signature.bmp

GPS File 51°49'46.05" N 5°15'34.16" E

GOOGLE MAPS

51.829458, 5.259489

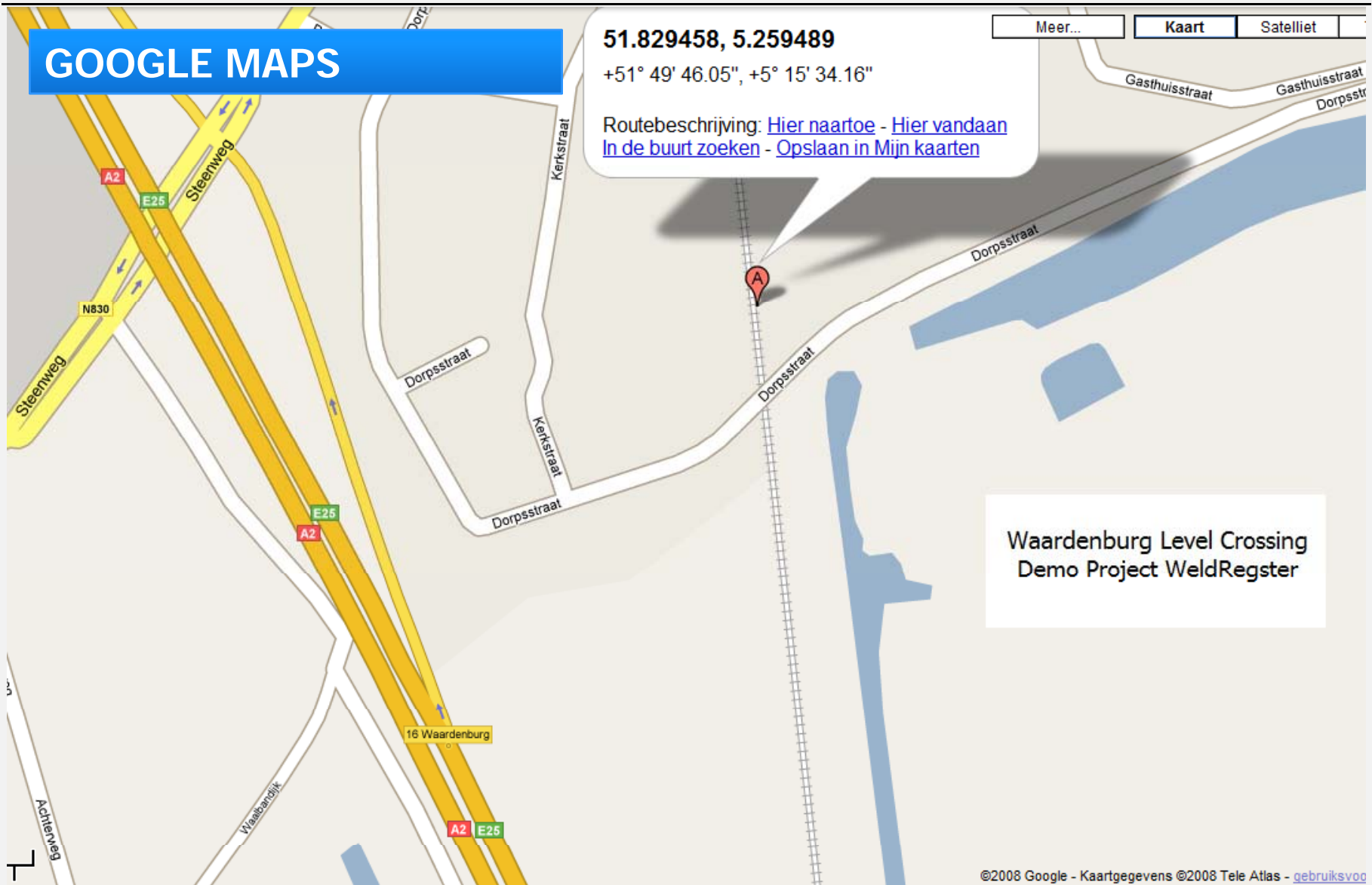
+51° 49' 46.05", +5° 15' 34.16"

Routebeschrijving: [Hier naartoe](#) - [Hier vandaan](#)
[In de buurt zoeken](#) - [Opslaan in Mijn kaarten](#)

Meer...

Kaart

Satelliet



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SESSION 17 October 2008, 14:00 – 15:50

- **Mr Mitsuo HIGASHI** Director, International Department EJRC (Japan)
IC Card's Customer-Oriented Technology
- **Mr Satoshi KOBAYASHI** Senior Engineer, Technical Research & Development Department WJRC (Japan)
Customer-Oriented Technologies in Providing Traffic Information
- **Mr Brian BOCK**, Senior advisor of UIC (previously Group General Manager of Queensland Rail in Australia)
Emerging Technologies for Sensing and Managing the Assets
- **Mr Robert D. PARISI**, General Manager of GE transportation
Emerging Technology for Locomotive Emissions