# INTELLISWITCH

## WP4: Metallurgical Characterization

## Degradation of rail steel in S&C´s

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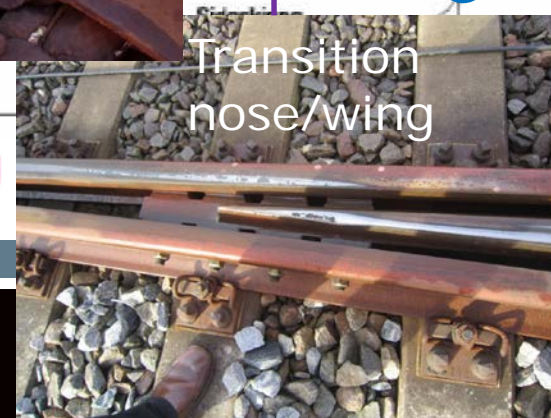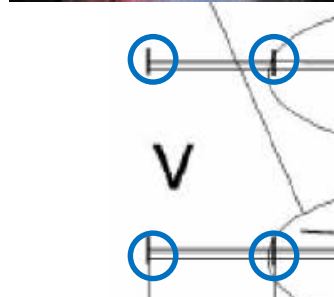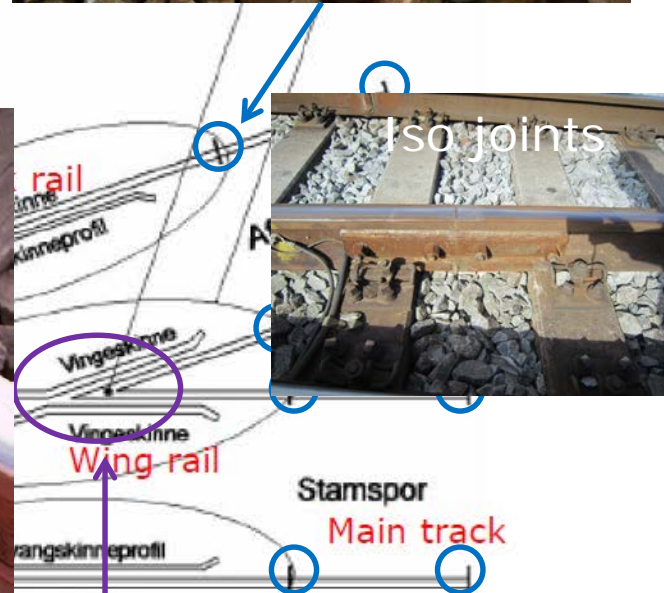Presented at Intelliswitch symposium, August 2017
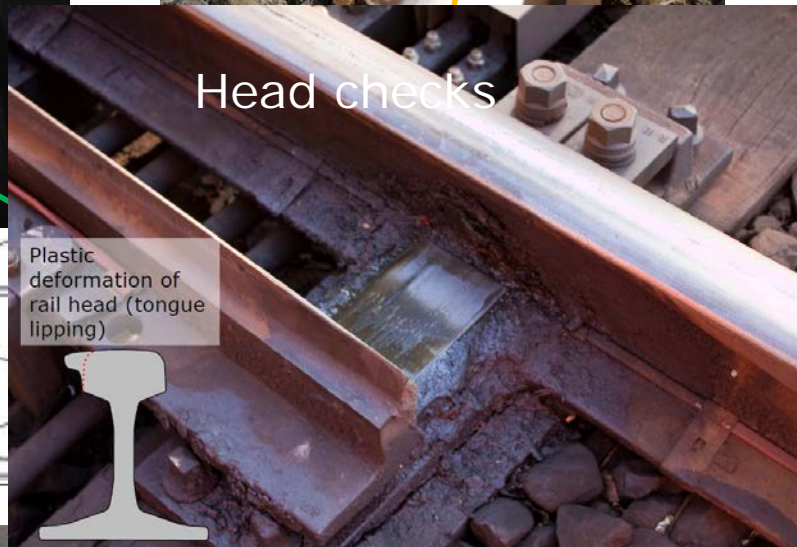
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# Content:

– Degradation of steel components in S&C´s
– Maintenance
– Noise

# Switches & Crossings, S&C

Parts of a turnout

Head checks

HC 06

Corrugation

Thermite welds

Head checks

Plastic deformation of rail head (tongue lipping)

Iso joints

Squats

Mellemparti
Closure panel

Transition nose/wing

Wing rail

Stamspor
Main track

# Head checks

# Squat causing heavy impact in track

# Squats in stock rail

# Defect in weld

# Corrugation

# Isolation joint

Plastic deformation of rail head (tongue lipping)

# Degradated transition zone nose/wing

# Transition zone nose/wing

# Transition from nose to wing

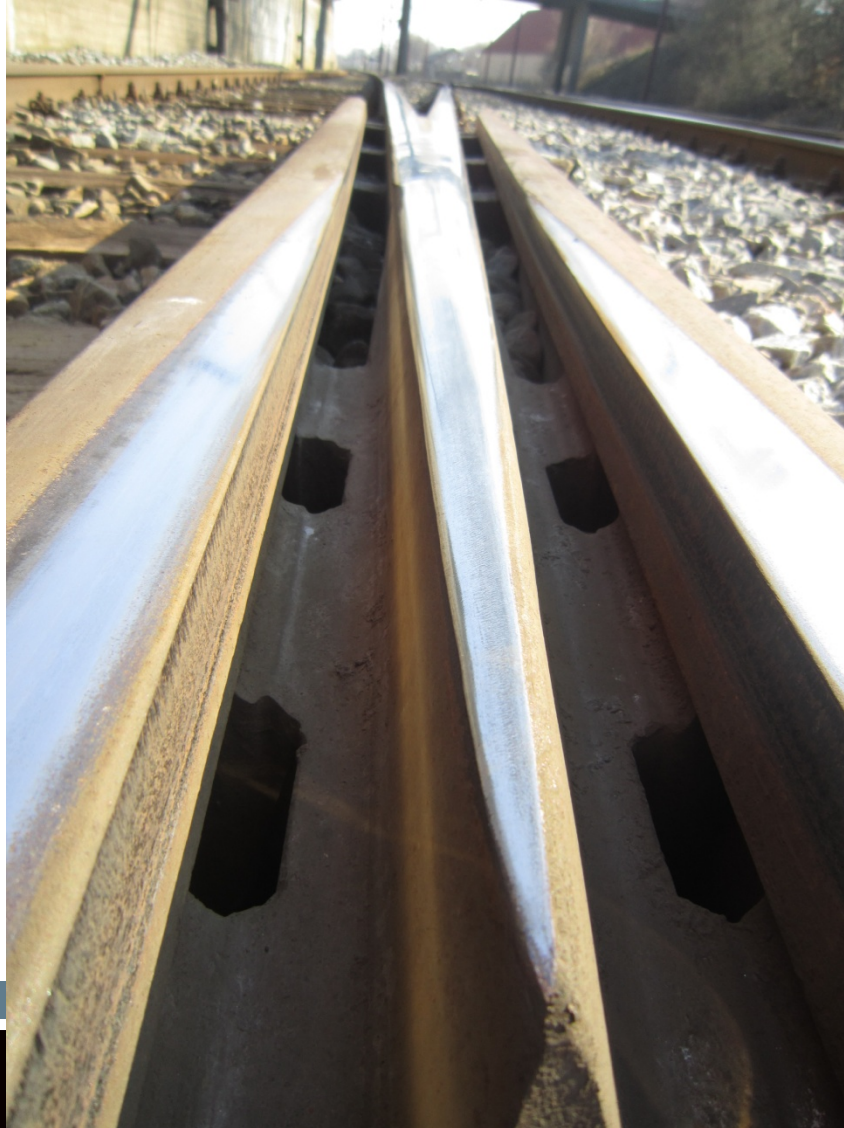**High Impact Forces**

# Deformations in nose of crossing

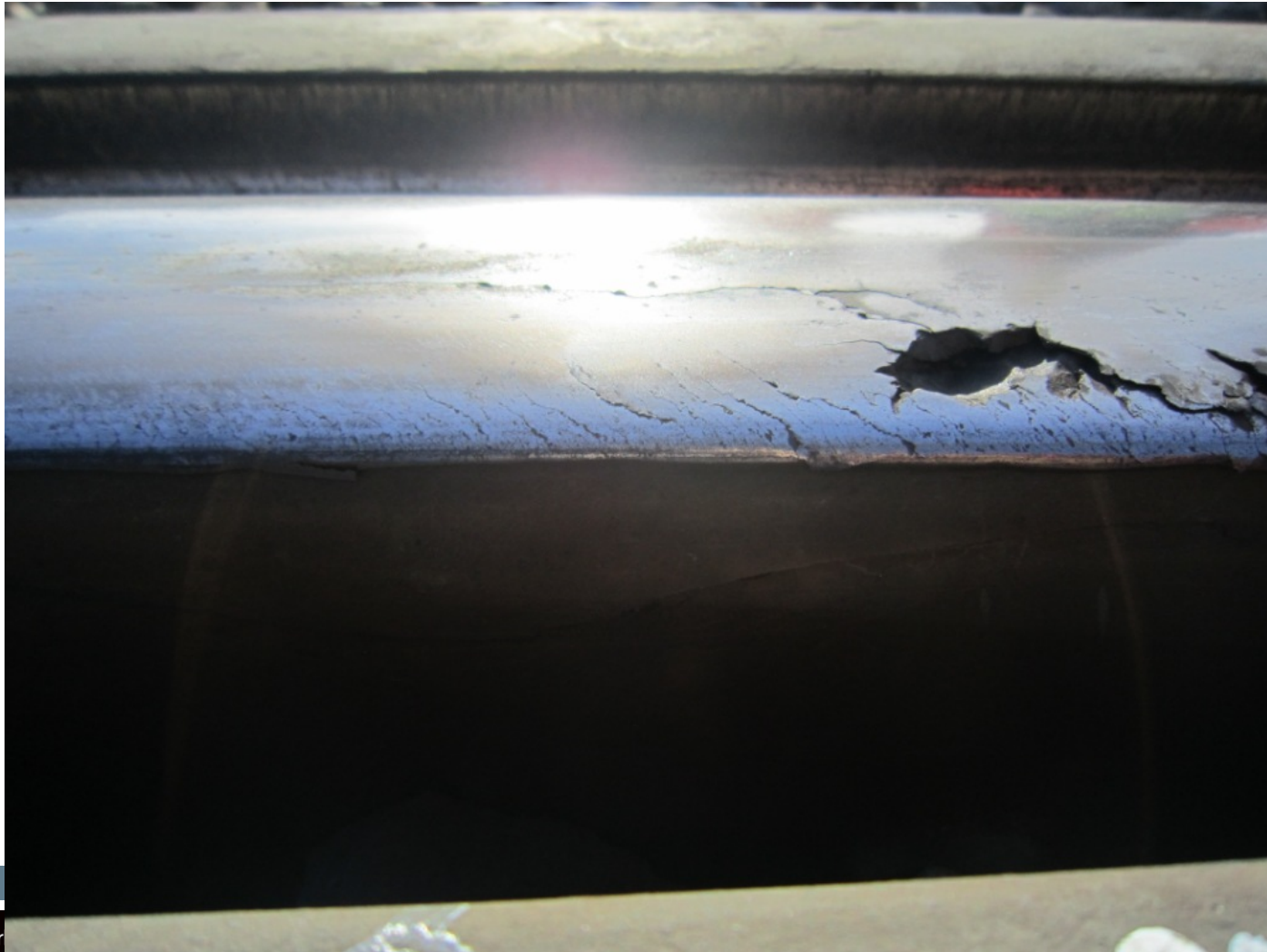Worn crossing, which needs a supplemental welding

# Degradation of nose of crossing
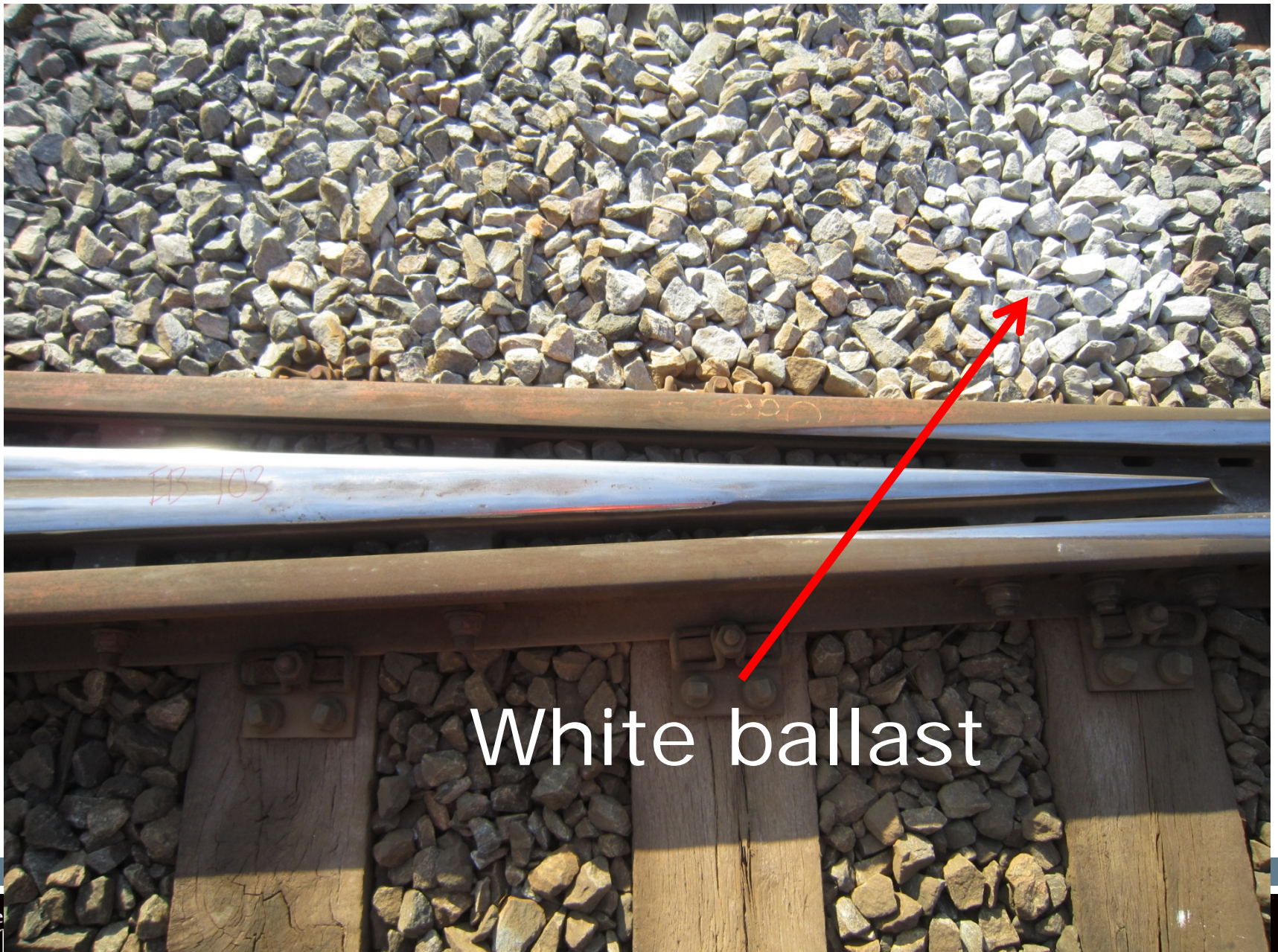
# Deformations and cracks in nose of crossing

# Squat like cracks in nose of crossing

White ballast

# Noise complaints because of bad geometry

# Maintenance of steel components in crossings:

- – Manual preventive grinding
- – Grinding train
- – Planning train
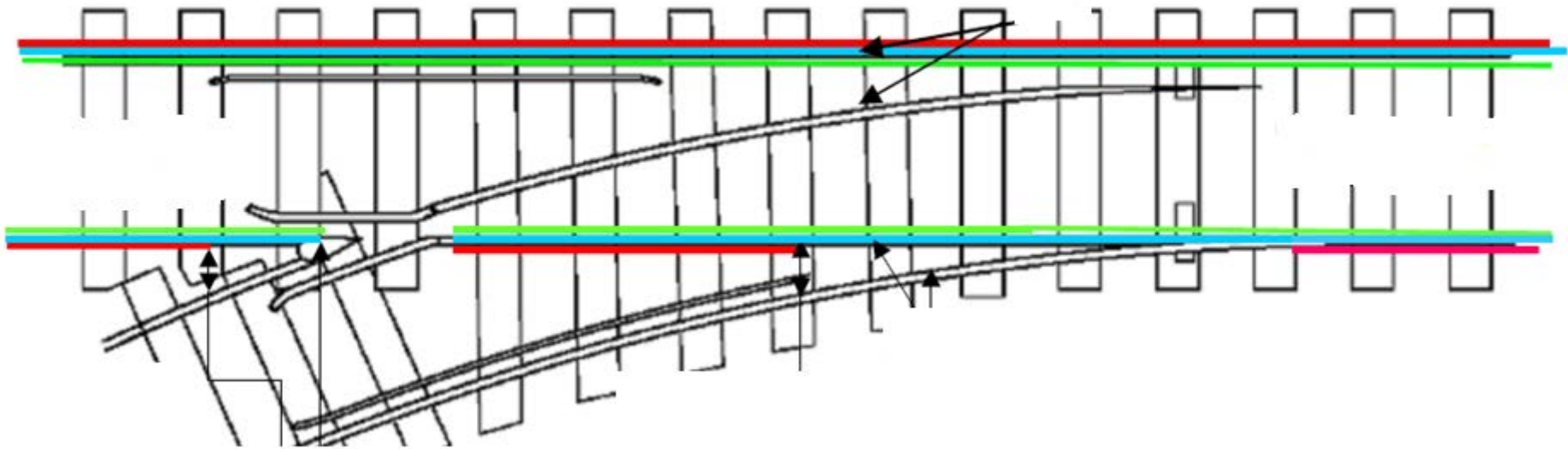- – Manual repair welding
- – Exchange of components

# Manual preventive grinding of lipping steel:

# Automatic grinding with train:

# Automatic planning of S&C:

Supplemental welding on crossing

# Heavy degradated nose of crossing – to be exchanged!

# Noise measuring close to wheel

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# High noise from track ….

# means often that something is wrong!

# Correlations between degradated steel components (eg. S&C´s) and noise.



- Alle måledata bliver lagt ind i Banedanmarks database, IRISSYS
- Da IRISSYS indeholder en mængde oplysninger om sporet og dets komponenter, kan måledata samkøres med alle disse øvrige oplysninger og give ny og vigtig viden om sporet og dets tilstand og udvikling

# Noise measurements in Banedanmark

Correlations between degradated steel components (eg. in S&C´s) and noise.

To detect degradation in an early stage to optimize maintenance activities – e.g. milling.

*Any experiences with use of noise measurements?*

HANK YOU
FOR YOUR ATTENTION

# NDT at transition zone nose/wing

- Visual test including photos
- Profile measurements with laser scanner "Calibri")
- Hardness measurements ("Eqoutip" )
- Penetrant test of small cracks