

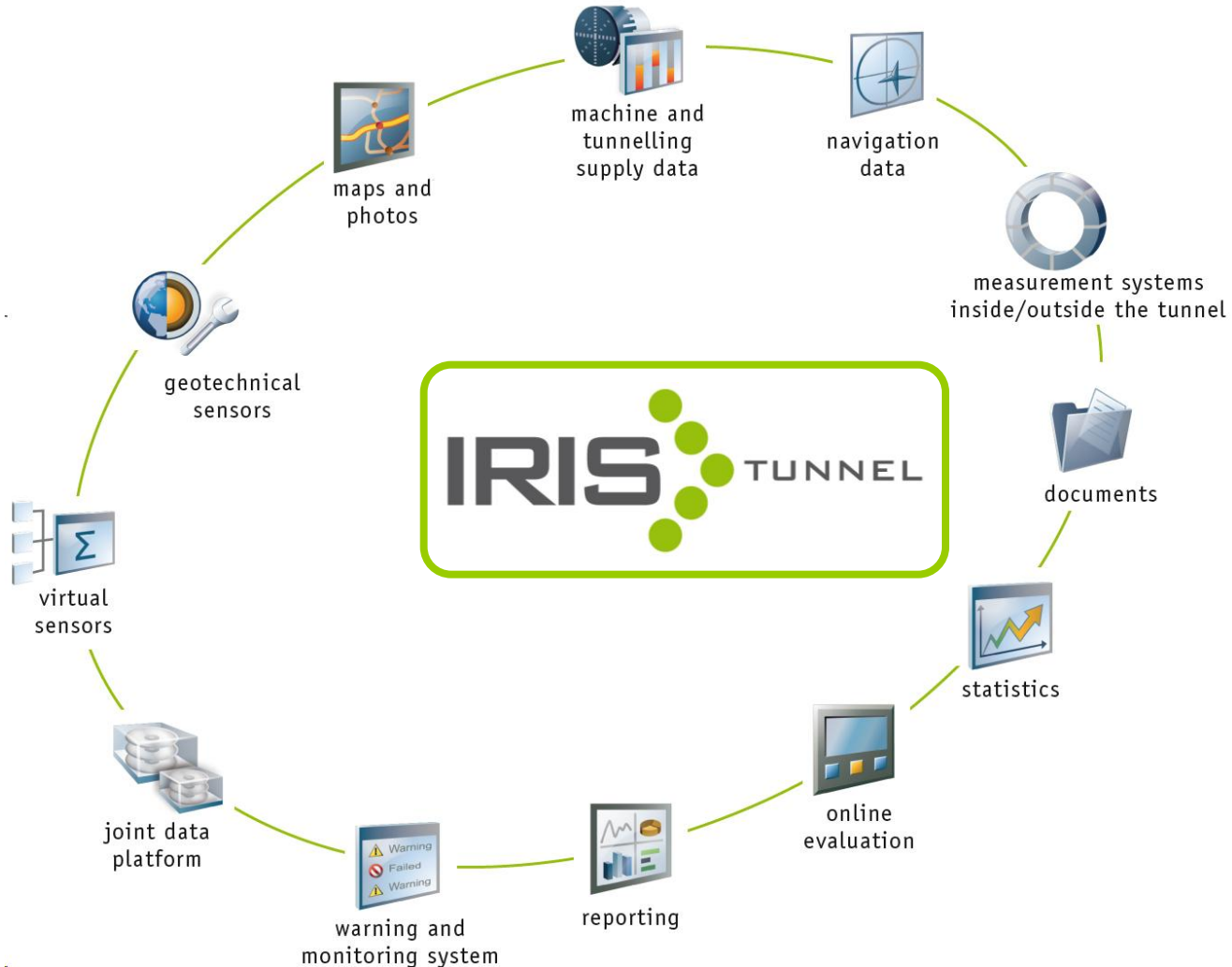
A photograph of a large tunnel interior, likely a water tunnel, with a person standing in a doorway on the right. The scene is dimly lit with a strong green tint. The tunnel walls are made of concrete and show signs of wear and construction. The floor is dark and reflective. The overall atmosphere is industrial and somewhat mysterious.

IRIS Infrastructure

Product Presentation

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Ed. Züblin AG

One integrated solution for data management, visualization and analysis





Integrated Risk Information System

- > Integration of risk and information management
- > Internet based

- > Risk assessment
- > Cost analysis

- > Data analysis
- > Data management
- > Communication
- > Transparency

- > Data platform
- > Life cycle management

- > IRIS is a 100% web application
- > Global access to local projects
 - central server / local internet browser
 - central data management and central support
 - no local installation, no local support
- > fast reaction time
 - reduced costs for operation and maintenance



→ Introduction

→ IRIS Tunnel program overview

→ Data input

→ Reporting

→ Visualization

→ Analysis

→ References

1 Log in

2 Data acquisition

a Process data (asynchronous import)

b Actual State data („real time“)

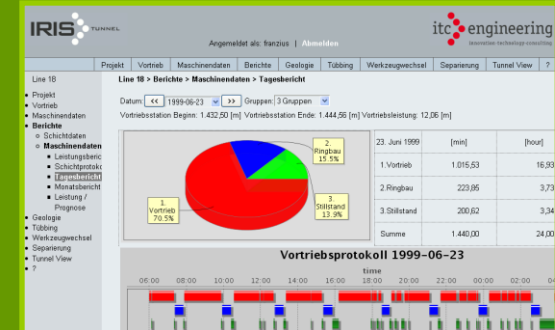
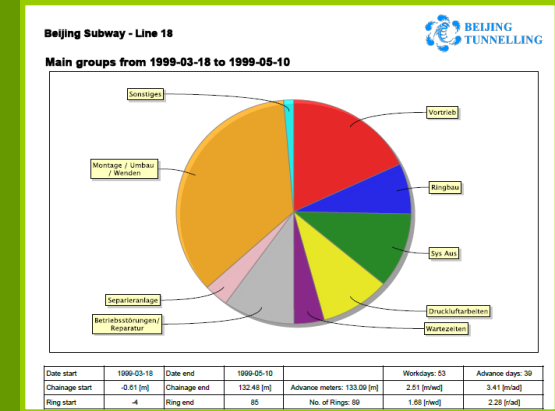
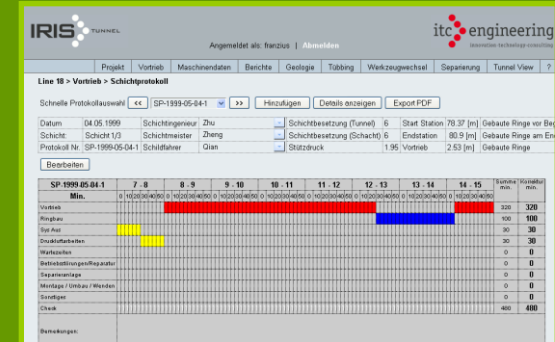
3 Reports

4 Analysis

a Standard modules

b Advanced modules

c Service modules



→ Introduction

→ IRIS Tunnel program overview

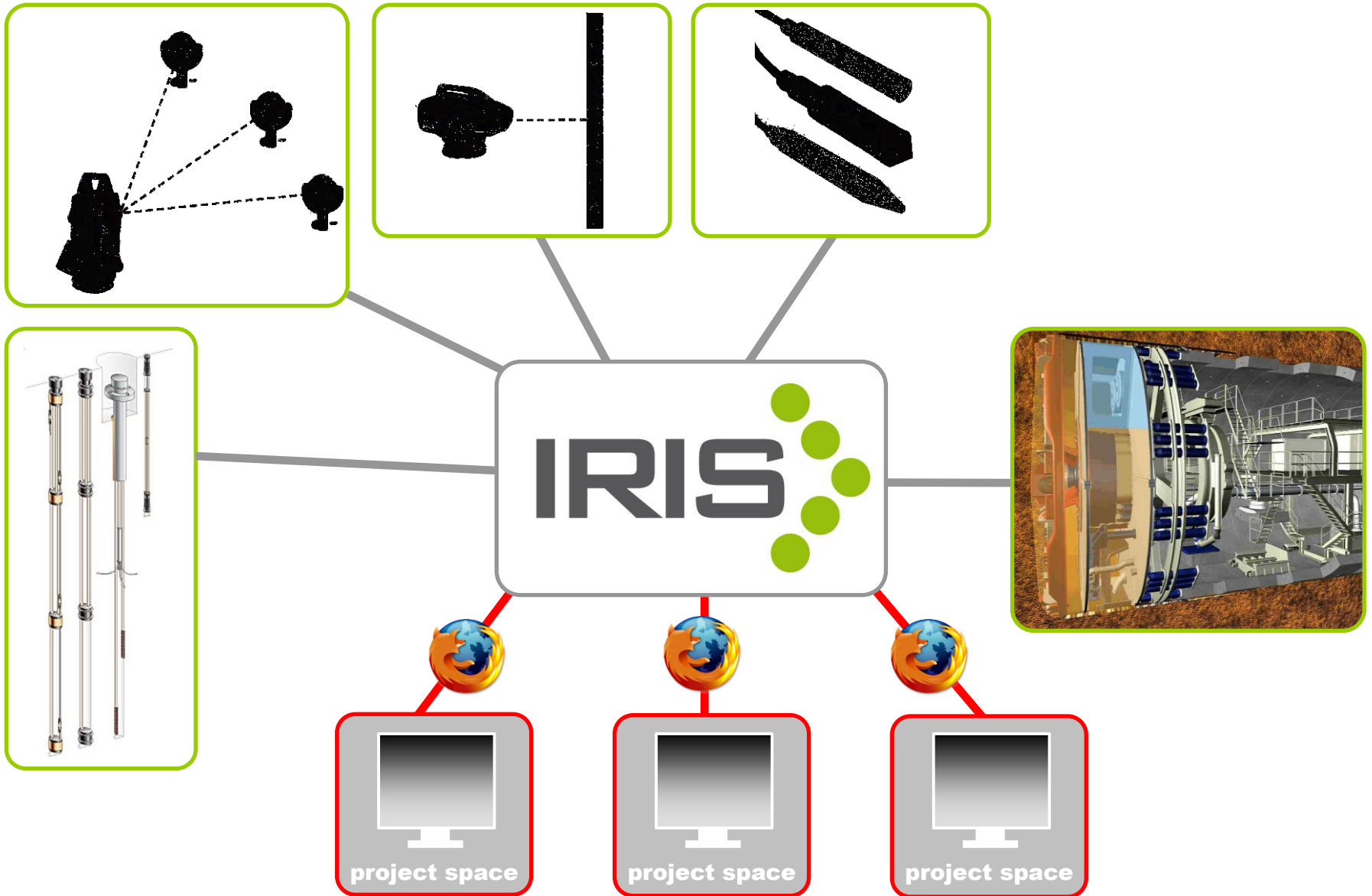
→ Data input

→ Reporting & Inventory lists

→ Visualization

→ Analysis

→ References



Advance

Ring installation

Stand still

- 301 Extension supply pipe
- 302 Extension water/air supply
- 303 Extension bentonite supply
- 304 Track works
- 305 High voltage works
- 306 Extension air ventilation

- Introduction
- IRIS Tunnel program overview
 - Data input
 - Reporting
 - Visualization
 - Analysis
- References

1 Import via IRIS, Field Bus, OPC, FTP

IRIS TUNNEL
Logged in as: franziu

Line 18 > Advance > Work shift report

Quick protocol choose: << SP-1999-05-07-2 >> [add] [show details] [export PDF]

Date	00/07/1999	Shift engineer	Chen	Pers.i.shift (tunnel)	6	Start chainage	103.91 [m]
Shift:	Schicht 2/2	Shift master	Zheng	Pers.i.shift (shaft)	5	End chainage	109.96 [m]
Report No.	SP-1999-05-07-2	Shift driver	Sun	Face pressure	2.2	Advance	6.05 [m]

[edit]

SP-1999-05-07-2	19 - 20		20 - 21		21 - 22		22 - 23		23 - 24		0 - 1		1 - 2																	
Min.	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50
Advance																														
Ring build																														
System out																														
Compressed air work																														
Waiting periods																														
Operational disturbances / reparation																														
Separating plant																														
Montage/ modification/ turn																														
Others																														

2 PDF export

Beijing Subway
Line 18
Daily report
May 9, 1999
CW: 1999-20

Chainage start	120.45 m	Rings built before start	77
Chainage end	132.45 m	Rings built at end	85
Chainage performance	12.03 m	Rings built	8

Tunnel length	888.00 m	Advance days	39	Workdays	46
Rate of Penetration	132.48 m	Rate of Penetration/ad	3.40 m/d	Rate of Penetration/wd	2.88 m/d
Tunnel length rest	755.52 m	Advance days rest (prediction)	222.4		

	Schicht 1/2		Schicht 2/2		Total		Percent
	[min]	[h]	[min]	[h]	[min]	[h]	
Advance	240	4.00	145	2.42	385	6.42	25.67 %
Ring build	295	4.92	150	2.50	445	7.42	29.67 %
System out	75	1.25	190	3.17	265	4.42	17.67 %
Compressed air work	110	1.83	15	0.25	125	2.08	8.33 %
Waiting periods	0	0.00	0	0.00	0	0.00	0.00 %
Operational disturbances / reparation	0	0.00	240	4.00	240	4.00	16.00 %
Separating plant	0	0.00	0	0.00	0	0.00	0.00 %
Montage/ modification/ turn	0	0.00	0	0.00	0	0.00	0.00 %
Others	0	0.00	40	0.67	40	0.67	2.67 %
Total	720	12.00	780	13.00	1500	25.00	100.00 %

Shift comments: Schicht 1/2 Shift, Schicht 2/2 Shift

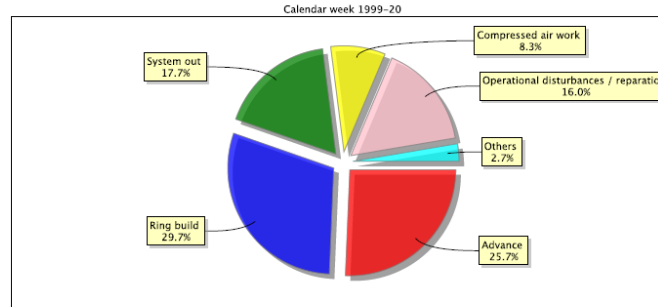
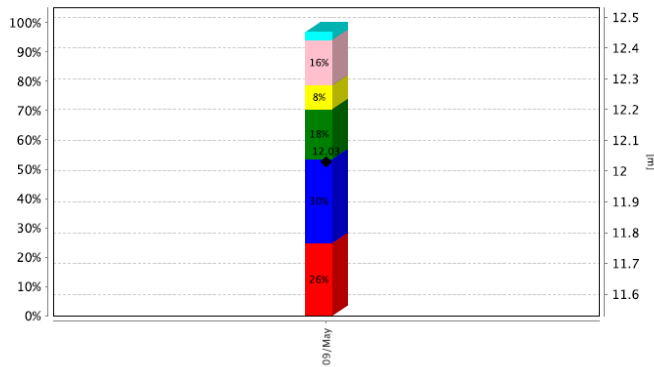
Daily comments:

System out	265 [min]	17.7%
Operational disturbances / reparation	240 [min]	16.0%
Others	40 [min]	2.7%
Compressed air work	125 [min]	8.3%
Advance	385 [min]	25.7%
Ring build	445 [min]	29.7%

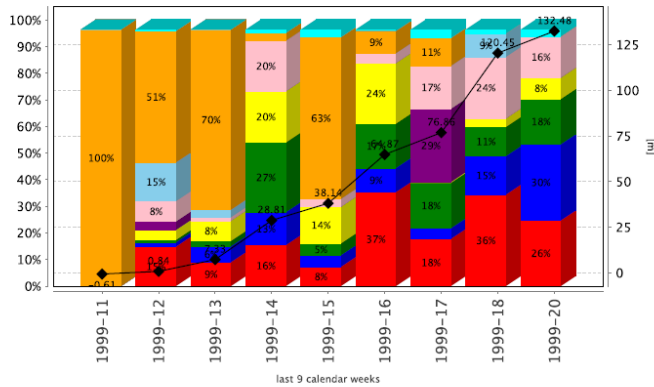
IRIS TUNNEL
created at: 2010Nov02 16:51

4 Standard weekly report

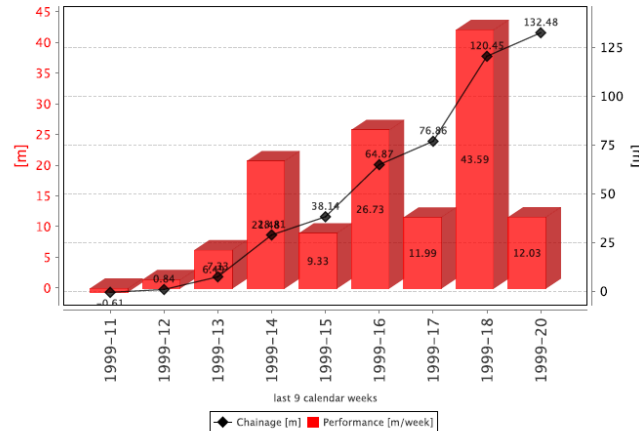
Beijing Subway - Line 18



◆ Performance ■ Advance ■ Ring build ■ System out ■ Compressed air work ■ Waiting periods
 ■ Operational disturbances / reparation ■ Separating plant ■ Montage/ modification/ turn ■ Others



◆ Chainage ■ Advance ■ Ring build ■ System out ■ Compressed air work ■ Waiting periods
 ■ Operational disturbances / reparation ■ Separating plant ■ Montage/ modification/ turn ■ Others



Weekly report CW 1999-20 from May 9, 1999 to May 9, 1999

© 2015 Nov-02 18:57

1 Data selection in IRIS

Datentyp Average Max Process Advance

Grenzen: Station

von: -9.0 [m] bis: 696.903 [m]

Min./Max.: von: -9.0 [m] bis: 696.903 [m]

Diagramm:

Vorlage: alle Vorlage

test1 (li)

Achse

Y-Achse 1 Y-Achse 2 Y-Achse 3 Y-Achse 4

- Arbeitsdruck Schneidrad [bar]
- Dichtmasse Schildschwanz Druck hinten H3.1 [bar]
- Dichtmasse Schildschwanz Druck hinten H3.2 [bar]
- Dichtmasse Schildschwanz Druck hinten H3.3 [bar]
- Dichtmasse Schildschwanz Druck hinten H3.4 [bar]
- Dichtmasse Schildschwanz Druck hinten H3.5 [bar]
- Dichtmasse Schildschwanz Druck hinten H3.6 [bar]
- Dichtmasse Schildschwanz Druck vorne V1.1 [bar]
- Dichtmasse Schildschwanz Druck vorne V1.2 [bar]
- Dichtmasse Schildschwanz Druck vorne V1.3 [bar]
- Dichtmasse Schildschwanz Druck vorne V1.4 [bar]
- Dichtmasse Schildschwanz Druck vorne V1.5 [bar]
- Dichtmasse Schildschwanz Druck vorne V1.6 [bar]
- Drehmoment Schneidrad [MNm]
- Drehzahl Schneidrad [1/min]**

Diagrammtyp: Liniendiagramm

Farbe Achse: blue

Feste Dimension: 15.0

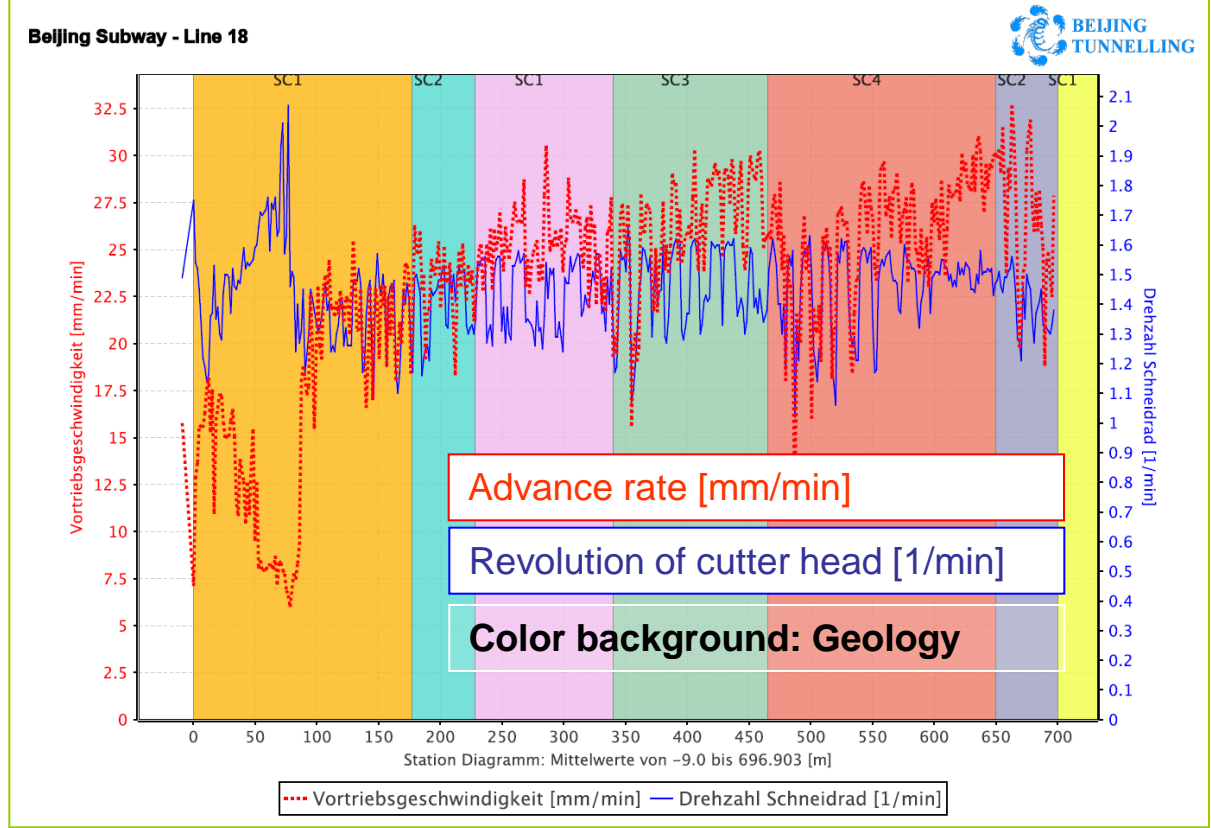
Wert anzeigen: Schriftgröße 9

Y-Achse Grenzen: automatisch

Obergrenze: 0.0

Untergrenze: 0.0

2 Export of diagram (PDF)




- > Risk assessment of environment
- > Decision management

- Introduction


- IRIS Tunnel program overview
 - Data input
 - Reporting & Inventory lists
 - Visualization
 - Analysis

- References

> Map viewer



Angemeldet als: franzius | [Abmelden](#)




Projekt
Vortrieb
Maschinendaten
Berichte
Geologie
Tübbing
Werkzeugwechsel
Separierung
Tunnel View
?


Line 18

- Projekt
- Vortrieb
- Maschinendaten
- Berichte
- Geologie
- Tübbing
- Werkzeugwechsel
- Separierung
- **Tunnel View**
 - **Google Maps Viewer**
 - SLS Viewer
 - SLS Einstellung
- ?

Line 18 > Tunnel View > Google Maps Viewer



Satellite Hybrid Map Terrain



> Guidance system (GS viewer)

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Project
Advance
Machine data
Reports
Geology
Segmental lining
Tool changes
Separation
Tunnel View
?

Line 18

- Project
- Advance
- Machine data
- Reports
- Geology
- Segmental lining
- Tool changes
- Separation
- **Tunnel View**
 - Google Maps Viewer
 - **GS Viewer**
 - GS setup
- ?

Line 18 > Tunnel View > GS Viewer

Deviations [m]	Rear	Front	Schneidrad [m]	Advance
Horizontal	-15	-5	Chainage	691
Vertical	-3	4	Tunnelmeter	691
Horizontal tendency [rad] <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">front 0</div> </div>			Cylinder extension <div style="height: 100px; border: 1px solid #ccc;"></div>	
Roll [rad] -1	Vertical tendency [rad] <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">rear 1.7</div> </div>		Reload Modus: <input type="text" value="forward"/> Dauer[Min.]: <input type="text" value="1"/> <input type="button" value="Start"/> <input type="button" value="Stop"/>	
Pitch [rad] 36			Auswahl: Chainage[m]: <input type="text" value="0.0"/> <input type="button" value="Go to ..."/> Advance: <input type="text" value="0"/> <input type="button" value="Go to ..."/>	
Measuring time Your local time: Jun 24, 1999 2:00:32 AM Buildsite time: Jun 24, 1999 2:00:32 AM			Navigation: <input type="button" value="<<"/> <input type="button" value="<"/> Jun 24, 1999 <input type="button" value=">"/> <input type="button" value=">>"/>	

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> Interactive Tunnel Viewer (ITV)

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Project
Advance
Machine data
Reports
Geology

Line 18

- Project
- Advance
- Machine data
- Reports
- Geology
- Segmental lining
- Tool changes
- Separation
- **Tunnel View**
 - **Interactive SVG Viewer**
 - Google Maps Viewer
 - GS Viewer
 - GS setup
- ?

Line 18 > Tunnel View > Interactive SVG Viewer

ITV - Interactive Tunnel Viewer

Koordinaten: X-Achse: 2,1129 km, Y-Achse: 3845,0

Legende:

PORFIDO_CUAR...	BRECHA_CLOR...	BRECHA_BIOTI...
GLACIAR_DE_HI...	PORFIDO_RIOD...	BRECHA_TURM...
COLUVIO	SOBRE_CARGA...	GLACIAR_ROCA
CUARZOMONZO...	ANDESITA	ZONA MINERALZ...
Tunnel	FALLAS	

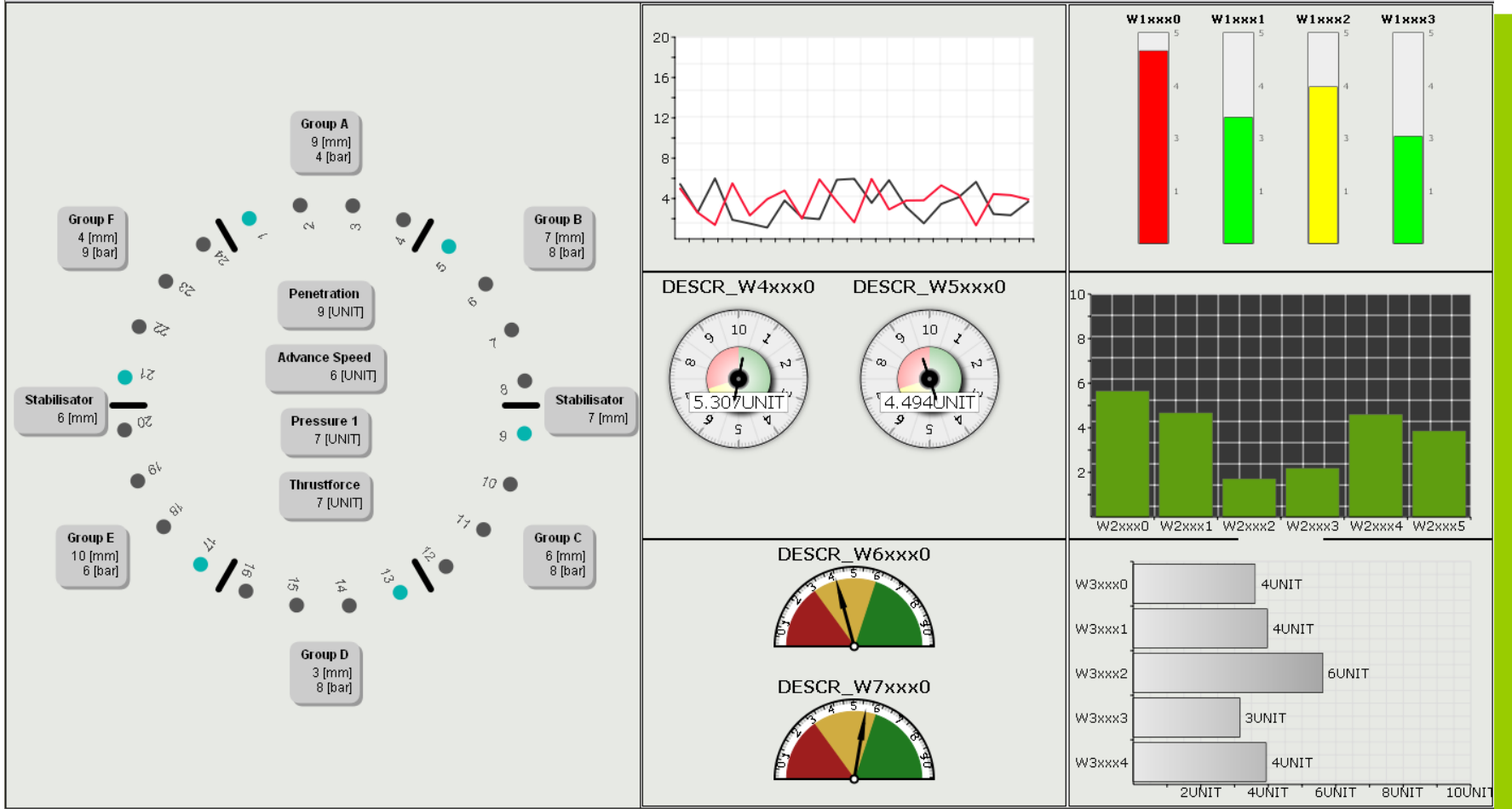
Ansichten:

- Geo
- Skala
- Strukturen
- Schnittpunkte

Tunnel 1

Geotechnical Long Section

> Online TBM Data Viewer



- Introduction

- IRIS Tunnel program overview
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 - Analysis

- References

Standard modul

G Environment

Advanced modules

1 Cutter wear > Site data / prognosis tools

2 Segment Management > Site data / damage records

3 Consumable record > Electricity, Water, Mortar etc.

4 Target-Performance analysis > Jack forces, advance etc.

5 Slurry plant > Mass balance, bentonite volume

6 Settlement > Surface Settlement Evaluation

Service module

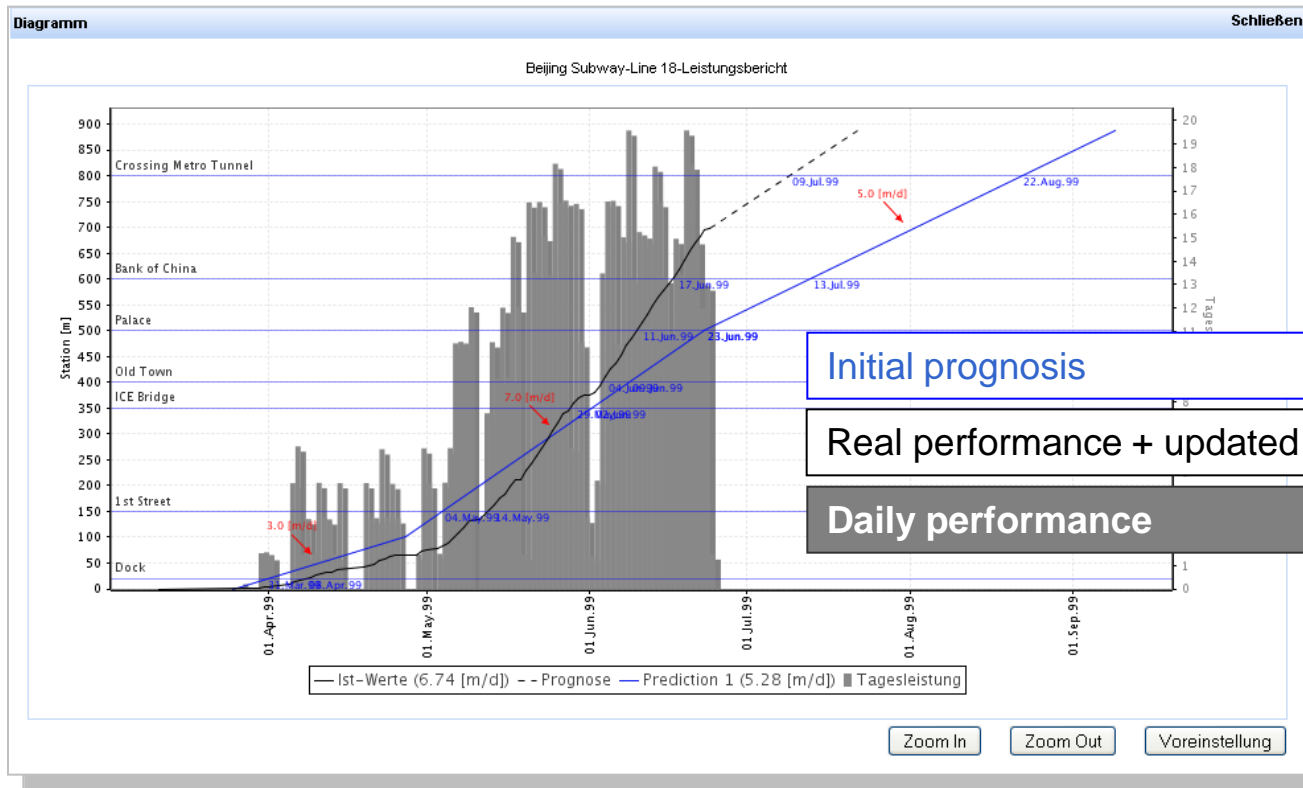
1 Data Interpretation > State and Process analysis

2 Interaction-Analyse > Recommendations / Decisions

Modules: **G** + **4**

> Prognosis

- Comparison with Performance-Data
- Update of prognosis with TBM-advance



Modules: **G** + **6**

Stützdruck

335.4
Stützdruck Firste

Verpressdruck

349.5
Verpressdruck Firste

Grenzwert Verpressdruck

349.5
Grenzwert Verp. Firste

SubsidenceView

Sector 1 Sector 2 Sector 3 Sector 4

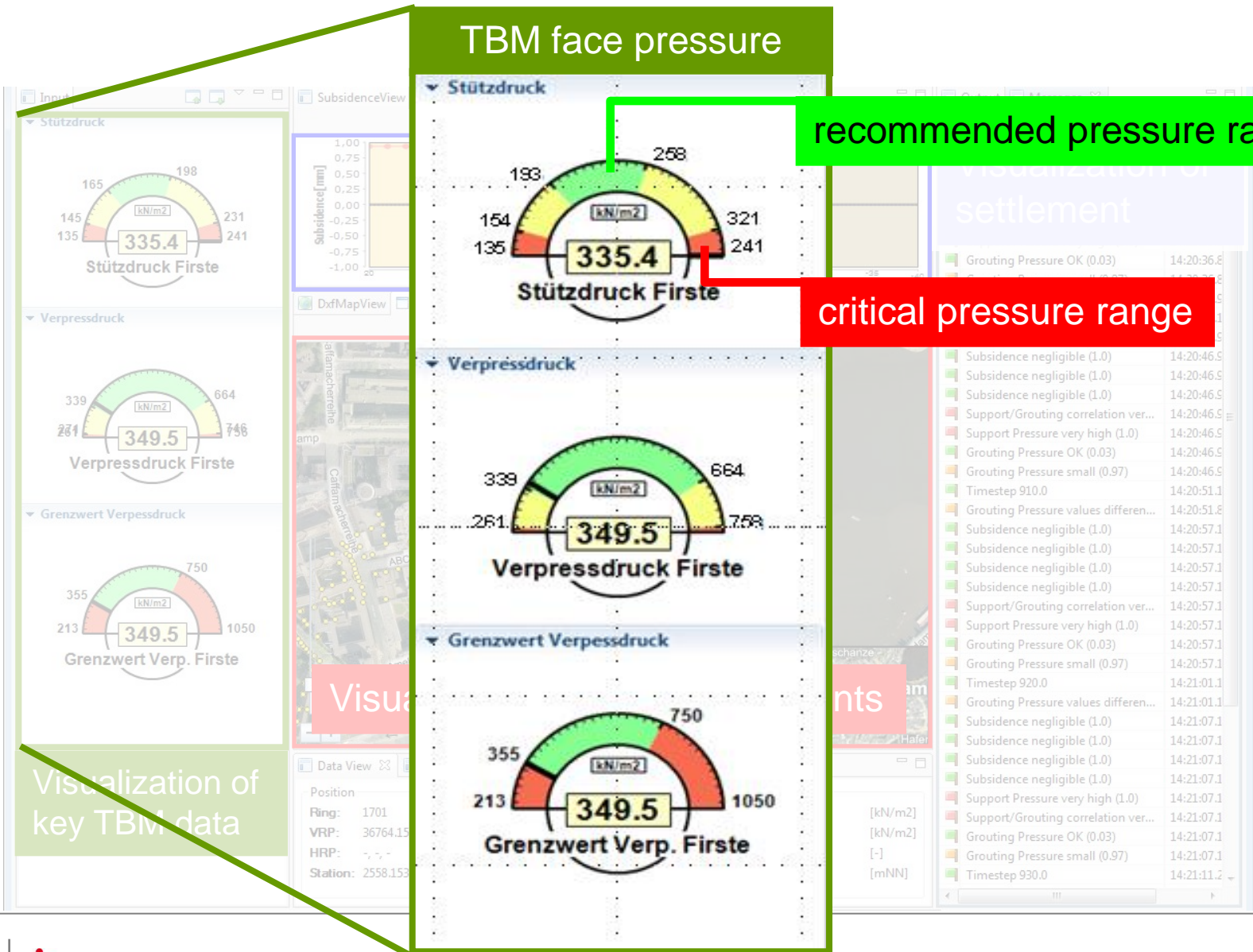
Visualization of settlement points

Output Messages

S. Message	Time
Grouting Pressure OK (0.03)	14:20:36.8
Grouting Pressure small (0.97)	14:20:36.8
Timestep 900.0	14:20:40.0
Grouting Pressure values differen...	14:20:41.1
Subsidence negligible (1.0)	14:20:46.9
Subsidence negligible (1.0)	14:20:46.9
Subsidence negligible (1.0)	14:20:46.9
Subsidence negligible (1.0)	14:20:46.9
Support/Grouting correlation ver...	14:20:46.9
Support Pressure very high (1.0)	14:20:46.9
Grouting Pressure OK (0.03)	14:20:46.9
Grouting Pressure small (0.97)	14:20:46.9
Timestep 910.0	14:20:51.1
Grouting Pressure values differen...	14:20:51.8
Subsidence negligible (1.0)	14:20:57.1
Subsidence negligible (1.0)	14:20:57.1
Subsidence negligible (1.0)	14:20:57.1
Subsidence negligible (1.0)	14:20:57.1
Support/Grouting correlation ver...	14:20:57.1
Support Pressure very high (1.0)	14:20:57.1
Grouting Pressure OK (0.03)	14:20:57.1
Grouting Pressure small (0.97)	14:20:57.1
Timestep 920.0	14:21:01.1
Grouting Pressure values differen...	14:21:01.1
Subsidence negligible (1.0)	14:21:07.1
Subsidence negligible (1.0)	14:21:07.1
Subsidence negligible (1.0)	14:21:07.1
Subsidence negligible (1.0)	14:21:07.1
Support Pressure very high (1.0)	14:21:07.1
Support/Grouting correlation ver...	14:21:07.1
Grouting Pressure OK (0.03)	14:21:07.1
Grouting Pressure small (0.97)	14:21:07.1
Timestep 930.0	14:21:11.2

Visualization of key TBM data

Position	SPS Daten
Ring: 1701	Verpressdruck Firste: 349.5 [kN/m²]
VRP: 36764.152, 65615.156, 0.0	Stützdruck Firste: 335.4 [kN/m²]
HRP: -, -, -	Status: k.A. [-]
Station: 2558.153	GW-Level: -1.06 [mNN]



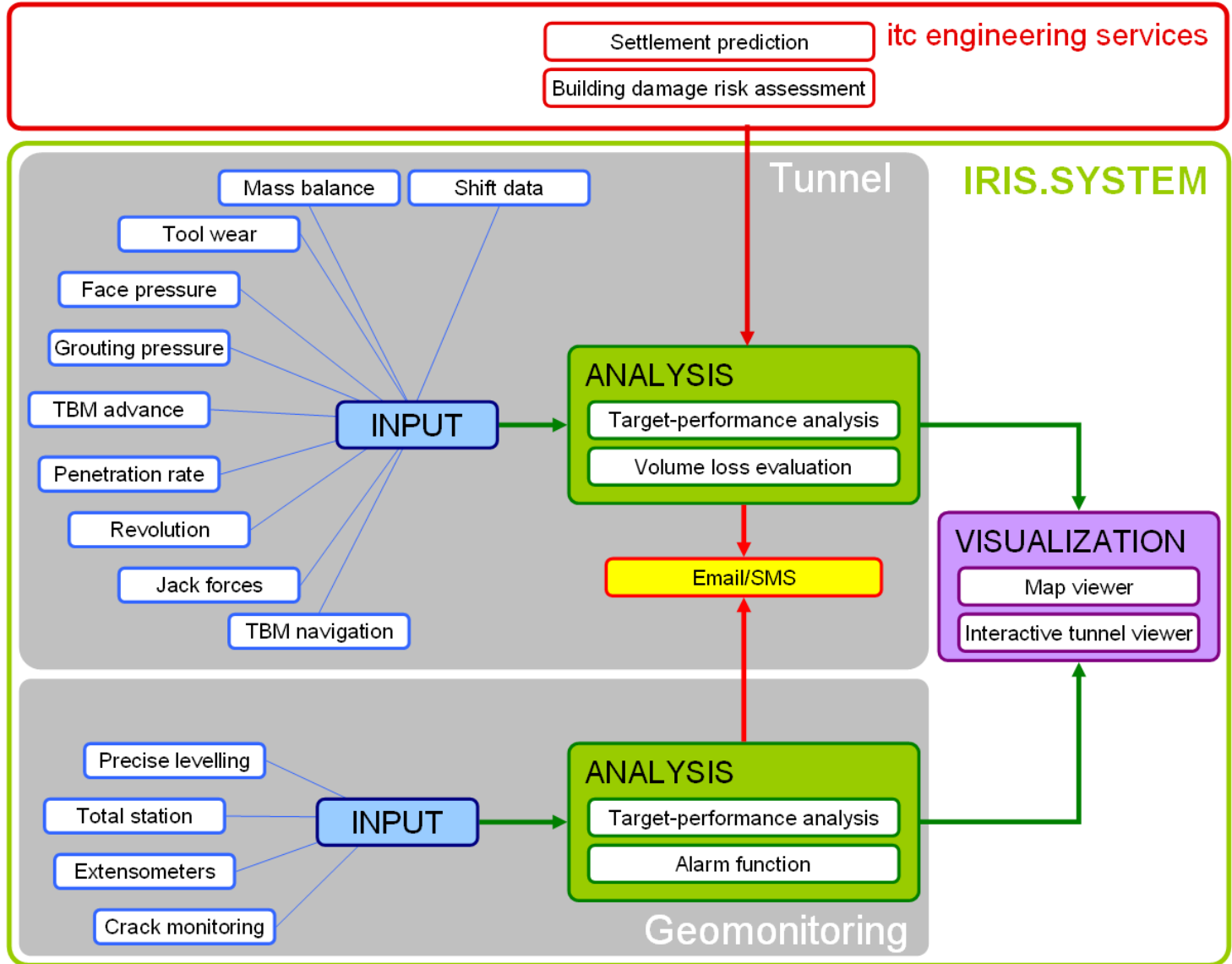


TBM control

- face pressure
- tail grouting
- cutter head revolution
- volume control
- etc.

Real time monitoring

- geotechnical monitoring
- building monitoring
- geo-environmental monitoring
- ground improvement records
- etc.



Thank you