



SOLUTION WINTER AND SUMMER ROUTINE MAINTENANCE OF MOTOWAYS – AUSTRIA

Ministry of Transport, Praha, 20th October 2016

Mario Krmek

ASFINAG Holding



AGENDA

- **ASFINAG – Overview**
- **Operational Tasks – General Overview**
- **Winter Service**



AGENDA

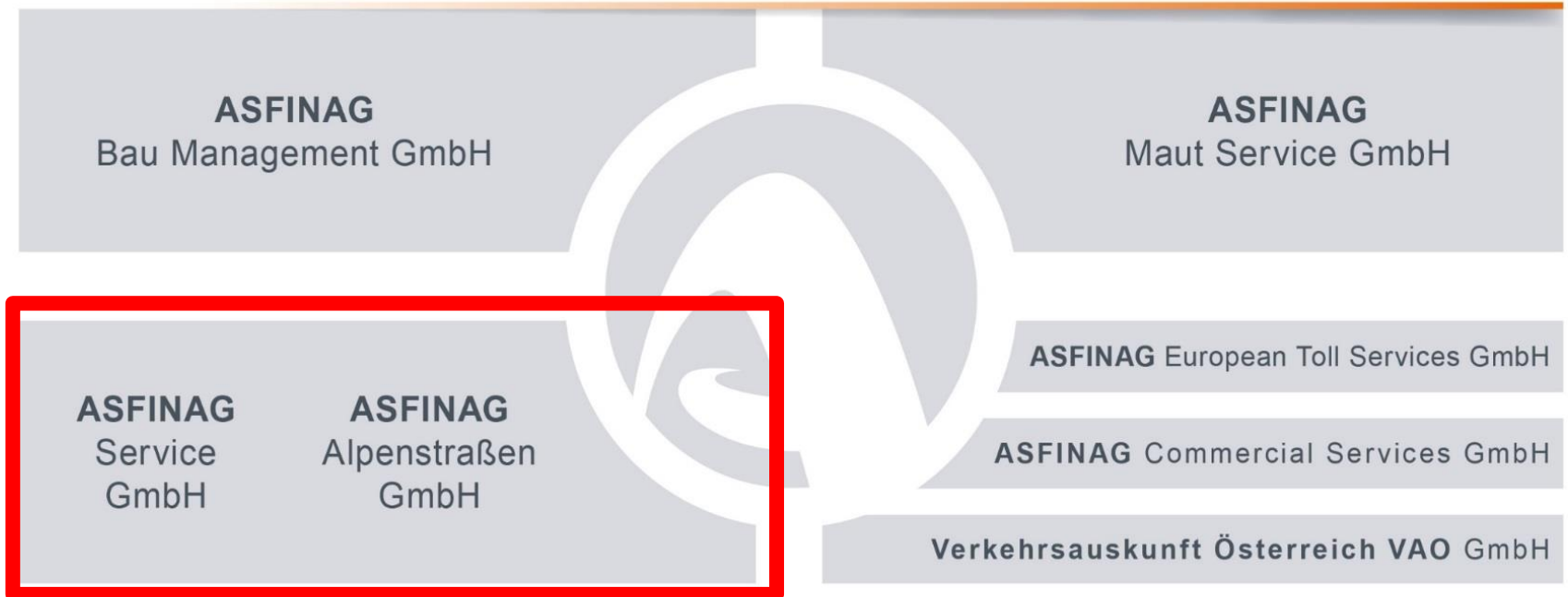
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ASFINAG

Company Structure



Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft



Shares are completely owned by the Republic of Austria.

ASFINAG

General Overview

- **Tasks:** Planning, construction, maintenance, operation, funding and tolling of motorways and expressways in Austria

- **Road network:** In operation: 2,199 km

- **Employees:** 2,742

- **Motorway operation and maintenance facilities:** 43

- **National traffic management center:** 1

- **Regional traffic management centres:** 9

- **Locations:** Wien, Graz, Innsbruck, Salzburg, Ansfelden, Zirl

- **Financing:** Vehicles < 3.5 t: toll stickers + special tolls
Trucks > 3.5 t: mileage-dependent toll

ASFINAG

Key Figures I

- Length of network: **2,199 km**
- Lane kilometres: **11,877 km**
- Tunnels: **164**
- Kilometres in tunnels: **383**
- Bridges: **5,192**
- Existing noise protection facilities: **1,327 km** (at the roadside and along central reservations)
- Total area of noise protection walls: **4.30 km²**

ASFINAG

Key Figures II

- Motorway operation and maintenance facilities: **43**
- Motorway service stations: **86**
- Rest areas: **48**
- **18,500 parking spaces for cars** and **6,855 for trucks**
- Parking areas: **110**

ASFINAG

Austrian Motorway and Expressway Network





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ASFINAG Service Companies

Strategy

Core Tasks

- Operation of the motorway and expressway network
- Maintenance of the existing infrastructure (roads, bridges, tunnels and other facilities and equipment)
- Traffic management and customer information

Strategic Goals

All activities are geared towards fulfilling ASFINAG's strategic goals:

- Increasing customer satisfaction
- Ensuring network availability
- Improving traffic safety
- Optimising performance standards and economic efficiency

ASFINAG Service Companies

Operational Tasks

- Operating 2,199 kilometres
- Cleaning rest areas and parking areas
- Snow clearance and gritting services provided 7 days / 24 hours
- “Ordering” refurbishment, upgrading and renewal works
- Cutting of grass, trees and shrubs
- Tunnel cleaning
- Reviewing and checking tunnel safety equipment and facilities
- Tunnel monitoring
- Section monitoring (→ ASFINAG Traffic Management Centre)
- Operation of traffic control systems
- Close cooperation with emergency services (police, Red Cross, etc.)



ASFINAG

Operation and Maintenance/Monitoring Centres



ASFINAG MOTORWAY MAINTENANCE, MONITORING CENTRES

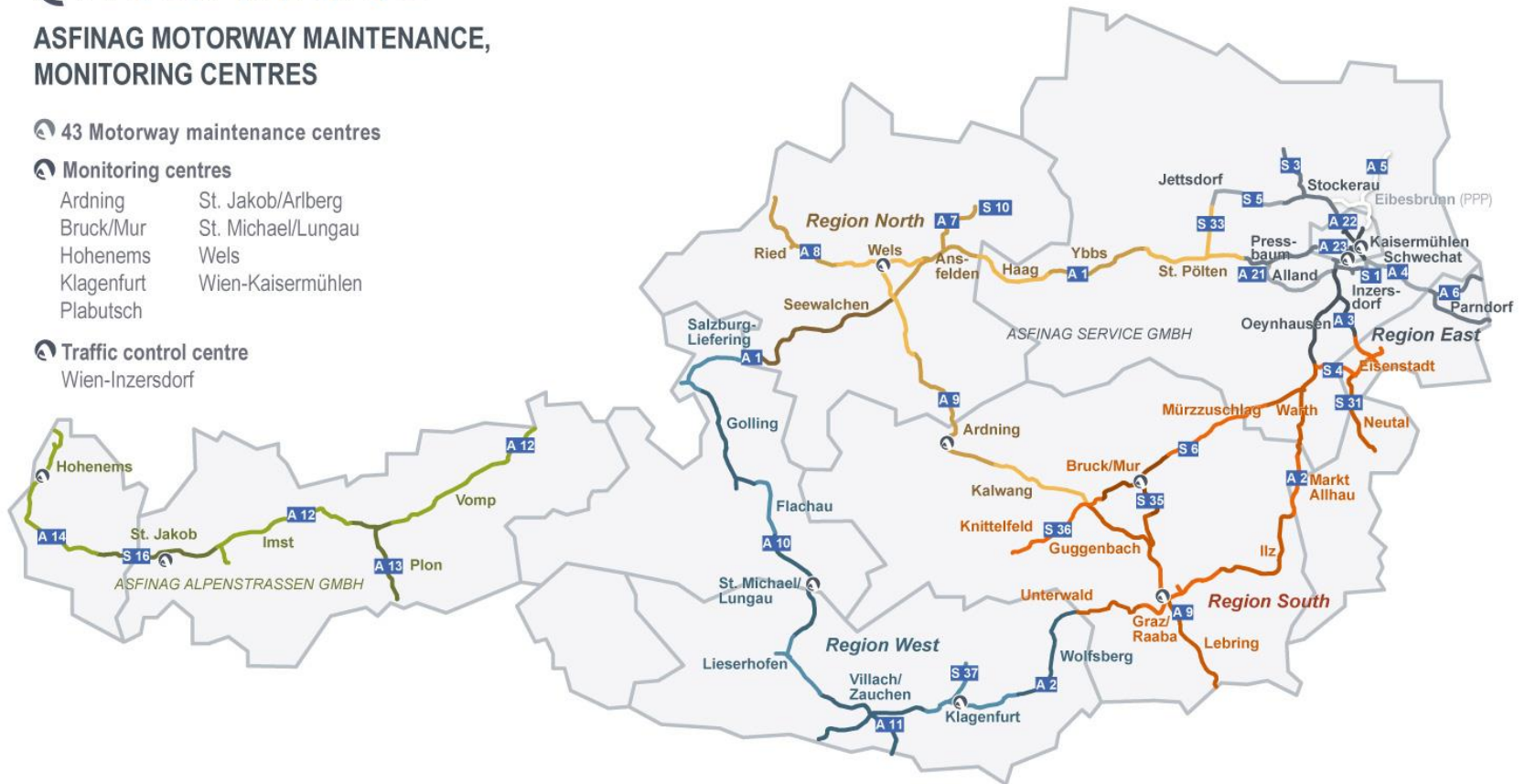
43 Motorway maintenance centres

Monitoring centres

- Ardning
- Bruck/Mur
- Hohenems
- Klagenfurt
- Plabutsch
- St. Jakob/Arlberg
- St. Michael/Lungau
- Wels
- Wien-Kaisermühlen

Traffic control centre

- Wien-Inzersdorf



ASFINAG Service Companies

Key Figures I

Staff (ASG and SG)

- Appr. 1,300 employees

Fleet

- 406 Trucks/Unimogs
- 403 Small trucks
- 443 Cars
- 63 Special vehicles



ASFINAG Service Companies

Key Figures II (2015)

- **Total costs** **EUR 115.5 million**
 - thereof personnel expenses **EUR 74.1 million**
 - thereof material used for gritting and snow clearance (salt, brine, etc.) **EUR 5.8 million**
 - thereof energy costs **EUR 1.1 million**
-
- **Salt consumption 2015** **approx. 62,300 tons**

ASFINAG Service Companies

Tasks - Road and Tunnel Cleaning

- Roads, tunnels, drain systems (road surface, drainage, waste water and gully systems, walls, ceilings, etc.) are cleaned at regular intervals
- Special equipment is used to clean tunnels
- All tunnel cleaning activities are coordinated to minimise traffic disruption
- Closing times are optimised by streamlining resources



ASFINAG Service Companies

Tasks - Care and Maintenance of Green Areas

- Cutting grass and weeds around traffic signs, radar boxes and mowing of hard shoulders and central reservations
- Mowing machine convoys are used to minimise the impact on the flow of traffic



ASFINAG Service Companies

Tasks - Winter Service: Gritting and Snow Clearance

- Activities related to gritting and snow clearance services actually start in summer: fixing snow poles, re-filling salt storage halls and adapting duty rosters
- In wintertime 1,200 staff are available for gritting and snow clearance services
- Ongoing monitoring of current and forecasted weather conditions
- Increased control and clearance of sensitive road sections
- Consideration of economic and environmental aspects



ASFINAG Service Companies

Tasks - Other Maintenance Works

- Repair works on small road surface sections, repair of joints and cracks in the road surface
- Maintenance, renewal and cleaning of road-side equipment – including traffic signs, overhead signage, safety barriers and roadside emergency telephones
- Works are usually performed at night when traffic volumes are low (except in cases of imminent danger)



ASFINAG Service Companies

Tasks - Traffic/Tunnel Monitoring

- 9 Monitoring Centres
- Staffed 24 hours/7 days
- Primary tasks:
 - Monitoring of network sections
 - Incident management
 - Monitoring ice warning systems (approx. 300)
 - Support gritting and snow clearance service
- Monitoring, maintaining, operating of electrical equipment (lighting, emergency call facilities, radio installations, etc.)





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Winter Service

Legal Basis

- Liability of operator → Austrian General Civil Law § 1319a
 - ASFINAG is liable for slight negligence
 - Reversed burden of proof
- Service level for winter maintenance → „State of the art“
 - Winter maintenance: 24 hours, 7 days
 - Spreading of thawing materials (not blunting)
→ „black clearance“
 - Turnaround time: max. 3 hours

Winter Service

Definition – “Black” Clearance vs. “White” Clearance

Black clearance:

- Wheel tracks are „black“
- Tyres have direct contact to the road surface
- Spreading of thawing materials (salt, brine)

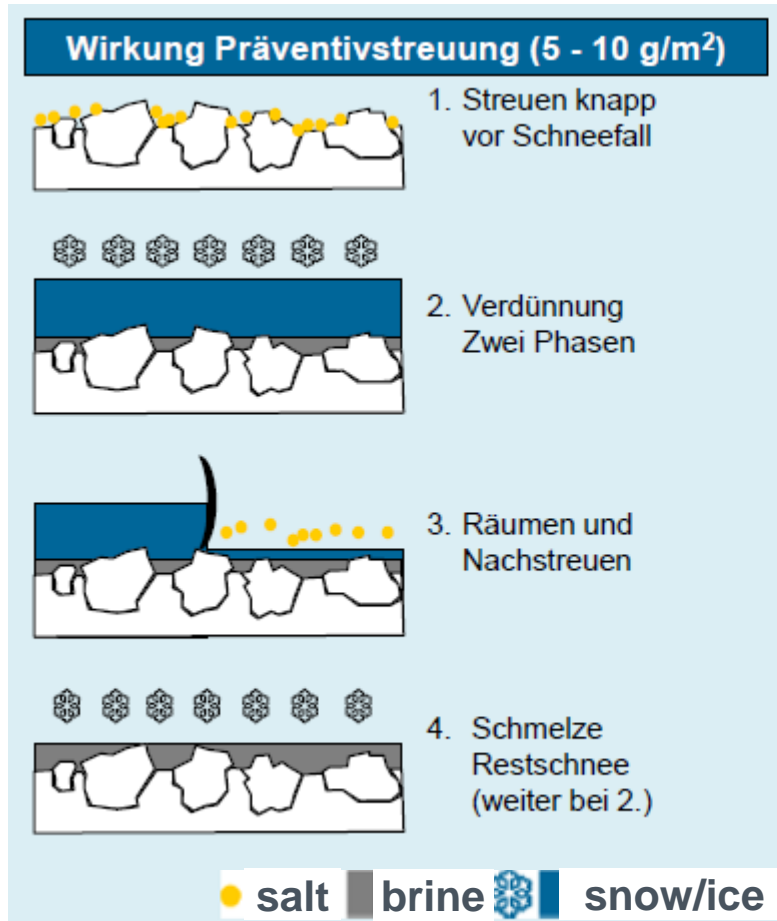


White clearance:

- Wheel tracks are „white“
- Tyres run on snow
- Scattering of grit



Winter Service Clearance Strategy



1. Preventive spreading
→ before snowfall
2. Melting of falling snow
(→ brine)
3. Snow removal + spreading
4. Melting of the remaining snow

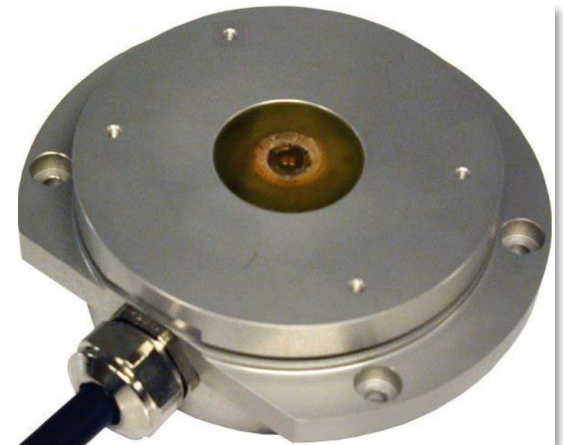


Winter Service

Tools – Ice Warning Systems

Ice warning systems constantly measure:

- Air temperature
- Road temperature
- Relative humidity
- Dew point temperature



In case of water film on the surface:

- Freezing temperature (depending on residual salt content)

Warnungen

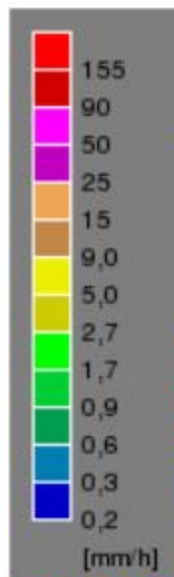
Meteogramme

Maps

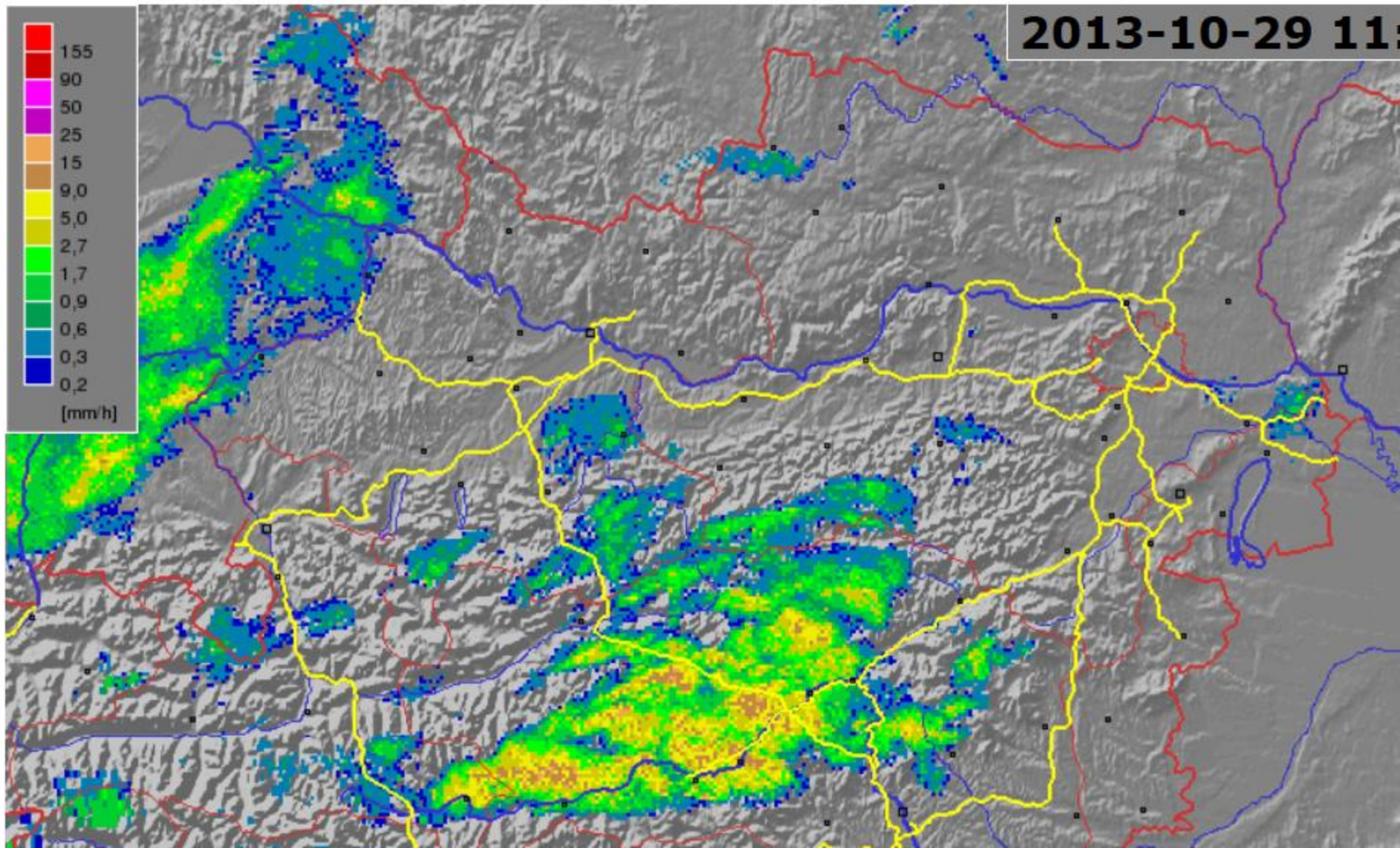
Radar

Sat

Blitz

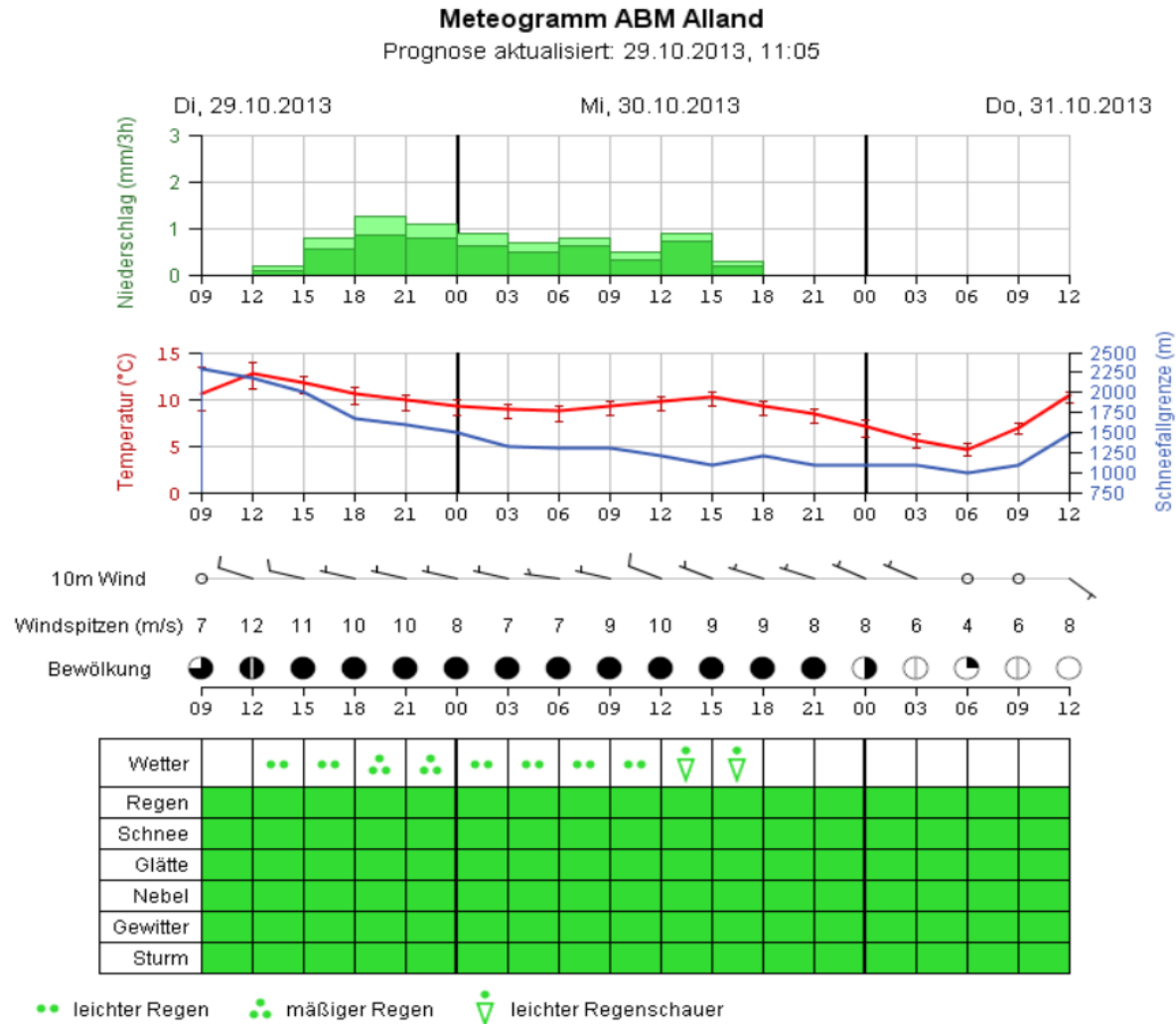


2013-10-29 11:50



Winter Service

Tools – Weather Forecast Software



Winter Service

Tools – Real Time Control Software

ifES - © Boschung

Datei Ansicht Anzeige Werkzeuge Module Fenster Hilfe

austror

RÜCKBLICK

ANSICHT
A21 Alland
neu laden

STATISCHE SCHICHTE
 AlpesRelief
 Land
 Wald
 Wasser
 Bebauung

Meteo-Stationen
 Fahrzeuge
 Fahrtrichtung
 Autobahnen-Info
 Now/Forecast

BN868FZ_A91
043001021025
25.03-22:29:53

INFO Einh.

Fahrer Fa_All023
 Stre... 134107 m
 Gesc... 53 km/h
 °Län... 16.009
 °Brei... 48.088
 Begi... 25.03-19:0
 Ende 26.03-07:0

GERÄTE
 ST_BN868FZ
 SP_BN868FZ
 FP_BN868FZ
 Räumen und

STREUUNG
 Salz
Dichte: 5,00 g/m²
Breite: 4,00 m

Hochstraß

Klausen/Leopold
LT:* -4.2 °C FBT:-2.3 °C
GT:-2.4 °C RLF:92.1 %
TPT:* -5.2 °C

Hagenau
LT:-4.9 °C FBT:-3.4 °C
GT:-6.6 °C RLF:86.9 %
TPT:-6.6 °C

Weissenbach
LT:* -4.2 °C FBT:-2.9 °C
GT:-1.7 °C RLF:92.8 %
TPT:* -5.1 °C

Alland_O
LT:* -4.8 °C FBT:-10.0 °C
GT:-10.0 °C RLF:92.8 %
TPT:* -5.1 °C

BN868FZ_A91 [043001021025]
25.03-22:25:23
ST_BN868FZ
SP_BN868FZ
FP_BN868FZ
Salz Dichte : 10,00 g/m²
Salz Breite : 4,00 m
Salz Menge : 5366,74 kg
Sole Dichte : ,00 g/m²
Sole Breite : 4,00 m
Sole Menge : ,07 kg

A21

St Brunn
St Grethübl
St Hinterb
Heiligenkreuz
St Tra

RÜCKBLICK
25.03.2013-22:30
19:31 01:31

Wetter
Fahrbahn
Schneeverweh.
Brücken

+3h +12h +24h +36h +48h +60h

07:42
24.10.2013

Winter Service

Snow Removal

- The amount of snow that can be defrosted with salt is limited (approx. 1cm)
- In case of snow: mechanical snow removing is necessary
- Staggered “formation“ of snowplows

ASFINAG’s winter service truck:

- 3-axle truck with appr. 400 HP
- 7 m³ → appr. 8.4t of salt
- Salt spreader
- Front and side plow
→ total clearing width 6.5m
- Working speed: 40-50 kph



Winter Service

Spreading Technology

- State of the art:
Prewetted salt “FS 30”
→ salt (NaCl) moistened with brine (NaCl or CaCl) in a ratio of 70:30
- Dosing of spreading quantity in preventive scattering:
5 – 10 g/m²
- Ion scattering during snow shovelling (without brine)



Winter Service

Tasks for the Future

- Improving forecast models
 - Pavement temperature
 - Forecast of hoarfrost

- Reduction of losses in preventive spreading
 - Increasing the brine-salt ratio (FS 50, FS 70, FS 100)
 - Rolling out of combined spreading machines (salt-brine mixing ratio from 0:100 to 100:0)



Winter Service

Operational Key Figures Winter 2014/2015

- Winter service days: 185
- Total distance driven by winter service trucks: 3,427,260 km
- Total operating time: 159,721 hours
- Total salt consumption: 70,332 t
- Total brine consumption: 8.312 million litres
- Average salt consumption per lane-km: 6.14 t/km
- Average brine consumption per lane-km: 725 l/km
- Average proportion of brine: 11%
- Total costs ASFINAG: 36,231 Mio. € (→ 3,147 € per lane-km)
- 92% of caring routes are serviced in less than 120 min (requirement = 180 min)



RELIABILITY ALL THE WAY.