VMAD-SG3
Audit & Assessment
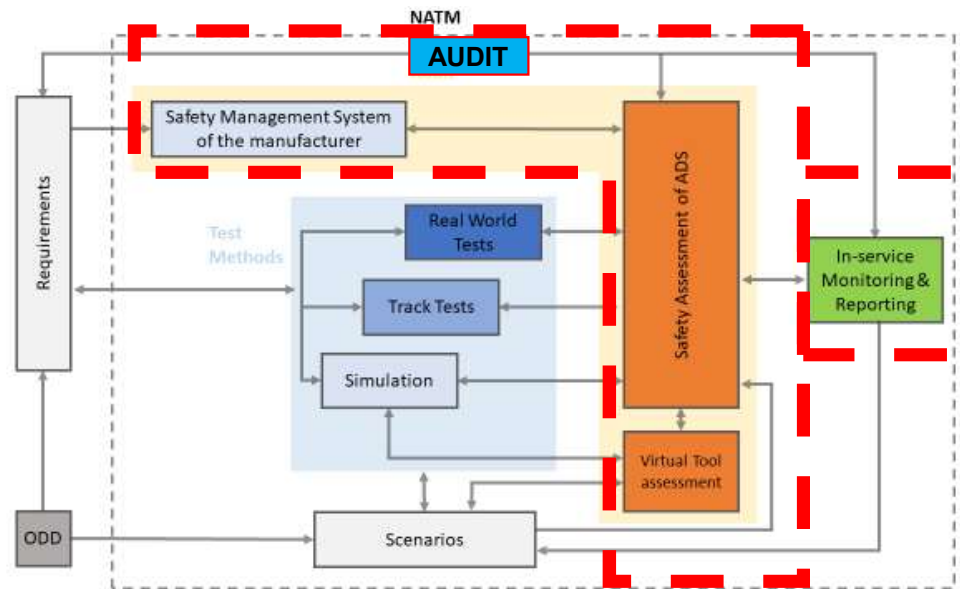# ISMR

Overview on ISMR guidelines

Espedito Rusciano
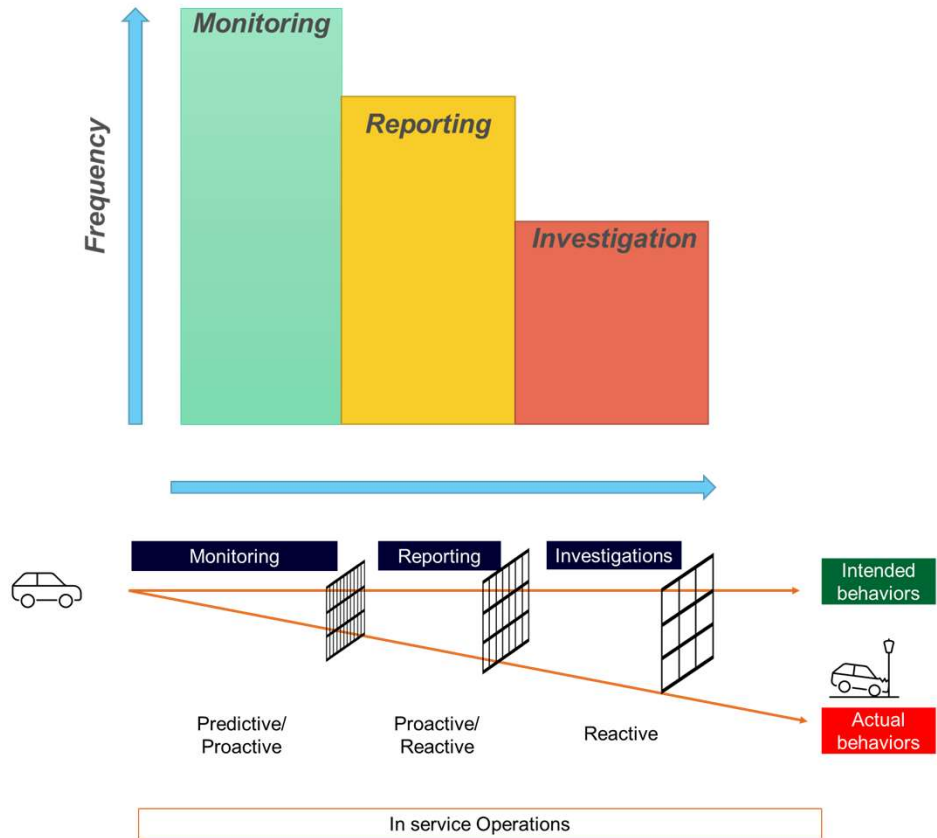
Maria Cristina Galassi

7th September 2023

VMAD SG3

› SG3 is a subgroup of VMAD IWG that provides a contribution for the development of the New Assessment/Test Method for automated driving (NATM)

› SG3 activities are focused on two areas: **Audit** and **In-Service Monitoring and Reporting**.

The 3 legs of ISMR

| Process	Focus
Monitoring	Overall Data collection and analysis
Reporting	Critical and not critical occurrences
Investigation	Critical occurrences

1. In Service Monitoring

Monitoring *(Link with the AUDIT Pillar)*:

- Manufacturers should set up a monitoring program according to the Safety Management System Requirements

- Vehicle data collection and analysis by the manufactures for reporting under ISMR, besides EDR/DSSAD

- Manufacturers are expected to collect data also from other accessible sources of data (e.g., customer reports)

Monitoring + Reporting → ISMR
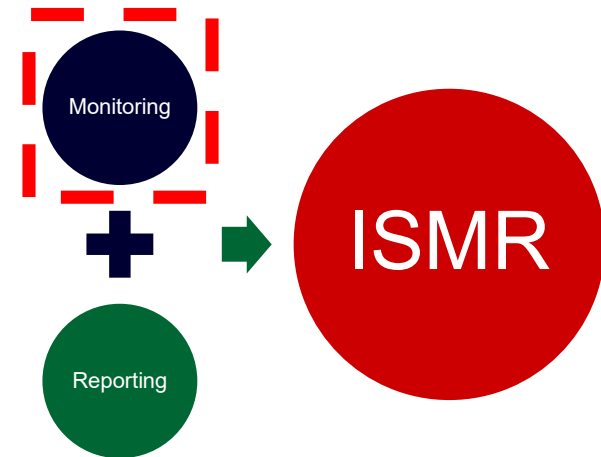
- Predictive and Proactive approach for Safety which shall be integrated in the Safety Management System

- Beyond the scope of the occurrences reporting.

- Increase safety by identifying trends and unusual or unsafe circumstances.

Recording

Data Transfer to Ground Station

Processing and Analysis
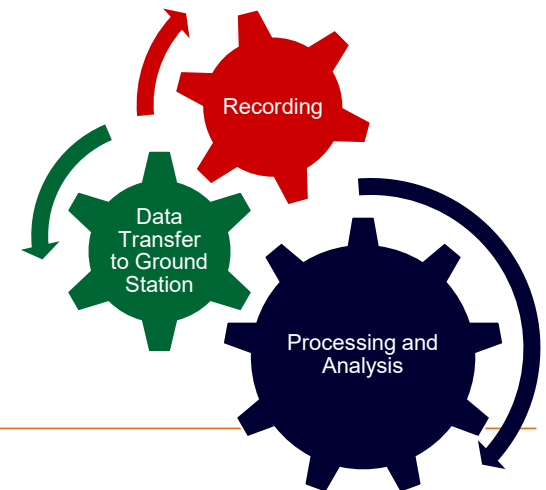
2. In Service Reporting

Occurrence Reporting*:*

- Occurrence refers to any safety-related event involving a vehicle equipped with an Autonomous Driving System.

- Two different categories of occurrences are identified for reporting: critical and not critical occurrences.

- The manufacturer should report, as required by the Authority, on both critical and non-critical occurrences.

Monitoring

+

Reporting

ISMR

Safety Culture

Just Culture

The main purpose of in-service reporting is the prevention of accidents and incidents and not to attribute blame or liability. (Just culture)
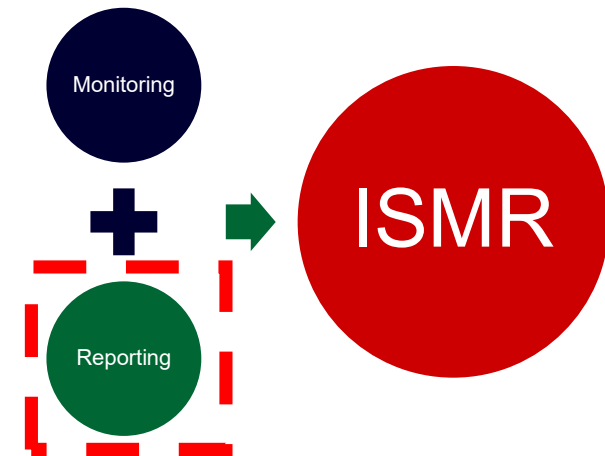
Occurrences list

OCCURRENCE	SHORT-TERM REPORTING [1 Month]	PERIODIC REPORTING [1 Year]
1.a. Safety critical occurrences known to the Autonomous Driving System manufacturer or OEM	X	X
1.b. Occurrences related to Autonomous Driving System operation outside its ODD	X	X
1.c. Autonomous Driving System failure to achieve a minimal risk condition when necessary	X	X
1.d. Communication-related occurrences		X
1.e. Cybersecurity-related occurrences		X
1.f. Interaction with remote operator if applicable		X
2.a. Driver unavailability (where applicable) and other user-related occurrences		X
2.b. Occurrences related to Transfer of Control failure		X
2.c. Prevention of takeover under unsafe conditions		X
3.a. Occurrences related Autonomous Driving System failure		X
3.b. Maintenance and repair problems		X
3.c. Occurrences related to unauthorized modifications		X
3.d. Modifications made by the Autonomous Driving System manufacturer or OEM to address an identified and significant Autonomous Driving System safety issue		X
4. Occurrences related to the identification of new safety-relevant scenarios	X	X

Reporting templates

Short term report

WHAT		
Entry name	Field to be filled	Type/size
Headline		Text(200)

OCCURRENCE CLASSIFICATION		

OCCURRENCE DETAILS		
Weather conditions		Text(20)
Lighting conditions		Text(20)
ADS vehicle pre-occurrence speed		Number(3) - [km/h]
ADS vehicle post-occurrence max deceleration		Number(3) - [m/s^2]
ADS vehicle estimated pre-occurrence mass		Number(5) – [kg]

WHEN		

WHERE		

DAMAGE		
Highest damage		Text(20)

INJURY		
Injury level		Text(50)

VEHICLE		
Vehicle Identific		17)
Serial number		
License plate		

NARRATIVE	
Description of the event	
Post-crash behaviour	

ANALYSIS		
Root cause analysis		
Corrective implementing action		

Periodic report

ADS IDENTIFICATION		
Entry name	Field to be filled	Type/size
ADS manufacturer		Text(50)
ADS licensing authority		Text(50)

ADS OPERATION INFORMATION		
Number of vehicles featuring ADS		Number(10)
Cumulativ		
Cumulativ		
Average A		

OCCURRENCES ASSESSMENT		
Cumulative number of occurrences		Number(10)
Occurrences covered under the short-term reporting provisions		Number(10)
Occurrences covered under the periodic reporting provisions		Number(10)

OCCURRENCES SAFETY OUTCOME		
Fatalities		Number(10)
• ADS vehicle occupants		Number(10)

OCCURRENCES AGGREGATE DESCRIPTION		
Collision with:		-
•		

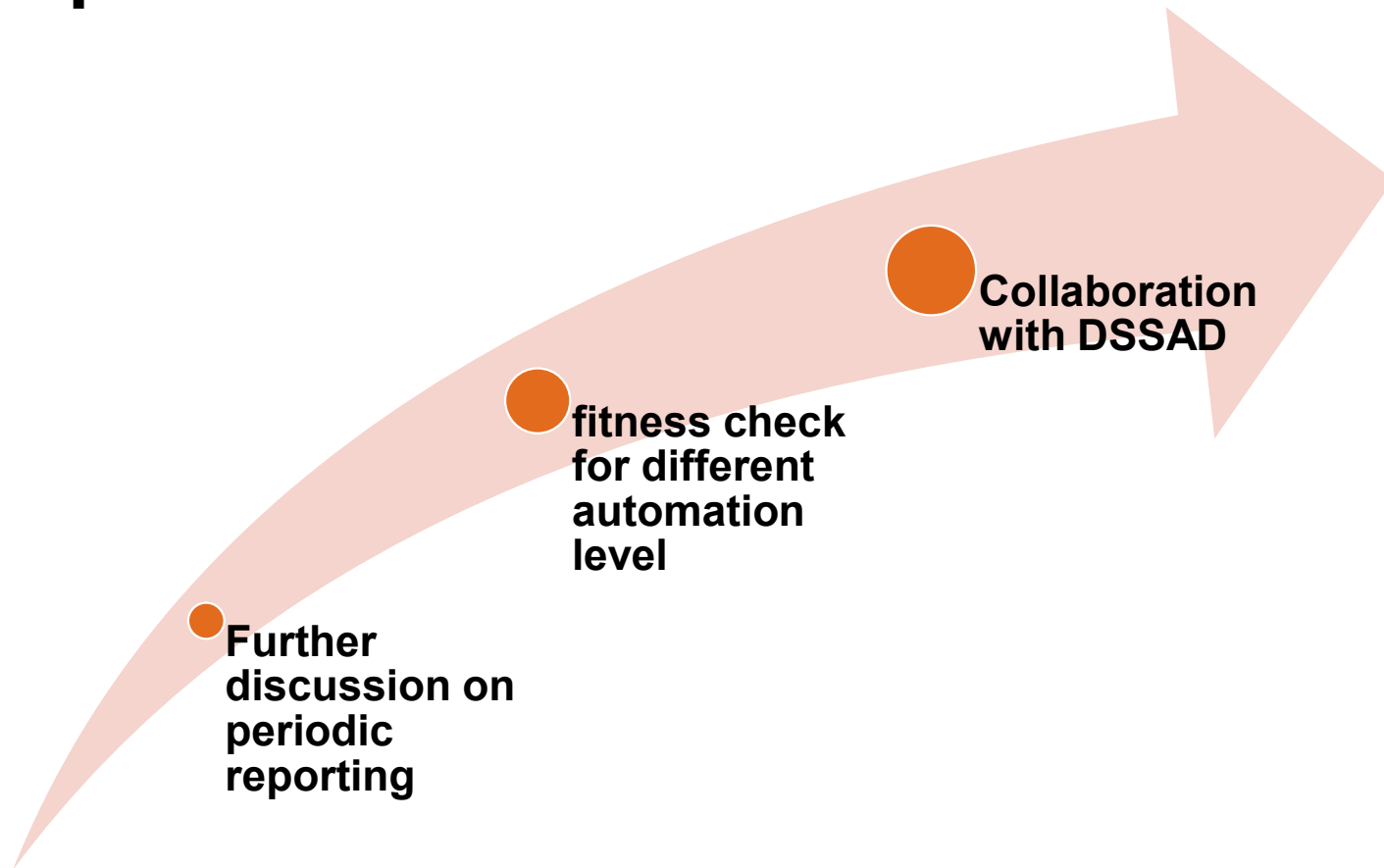| ADS SAFETY GAP		
ADS discovered safety gaps		Number(10)
• Gap #1:		Text(500)
• Gap #2:		Text(500)
ADS addressed safety gaps (if any)		Number(10)

3. Investigation

Occurrence Investigations

- ***Focus on critical occurrences***, but it can include also other occurrences

- It is expected an immediate notification to the authority on occurrences which can pose an immediate risk to public safety.

- An ***Independent body*** conducts investigations according to its mandate

- The ***investigation report***, containing where appropriate ***safety recommendations***, should be made available to all parties involved in the shortest possible time.
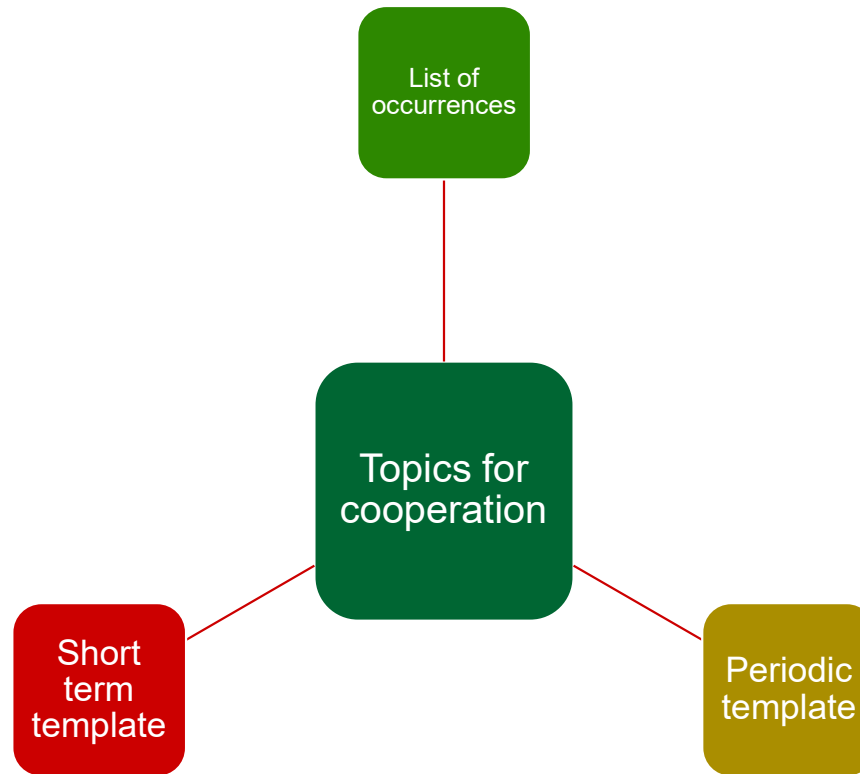
The main purpose is the safety investigations of accidents and serious incidents to prevent future occurrences

Next Steps for ISMR

Collaboration with DSSAD

fitness check for different automation level

Further discussion on periodic reporting

Cooperation with DSSAD

Reference documents

> **Master Document on the New Assessment/Test Method**

> Initial document: Informal document WP.29-183-05, endorsed in March 2021
> First iteration: ECE/TRANS/WP.29/2021/61, adopted in June 2021
> Second iteration: ECE/TRANS/WP.29/2022/57, adopted in June 2022

> **Guideline for Validating Automated Driving System (ADS)**

> ECE/TRANS/WP.29/2022/58, amended by WP.29-187-08, endorsed in June 2022
> ECE/TRANS/WP.29/2023/44/Rev.1, adopted in June 2023

Thanks for your Attention

Reporting from other sources

› Limiting the reporting requirements to manufacturers will also limit the amount and type of information covered by ISMR, with a strong impact on the achievable safety improvement.

› E.g. identification of traffic rules infringement is not possible through data collected on-board the vehicle, and reporting by local authorities and Autonomous Driving System vehicle users is needed.

› Other transport sectors extend the operational reporting mechanism also to <u>drivers</u>, <u>operators</u>, <u>users</u>, <u>traffic managers</u>, and <u>any other person connected to the vehicle operation</u>.

Information Sharing & Protection

› The final aim of ISMR is to improve Autonomous Driving System safety through dissemination of lessons learned

› A broader exchange of information and the dissemination of safety recommendations should be ensured among the Contracting Parties/Authorities, at international level

› Data collection should ensure confidentiality, the protection of its source

› Sensitive safety information should be protected by preventing its use for purposes other than safety.

Guiding principles

› Safety Authorities must set up a confidential reporting scheme and to ensure that no personal details are ever recorded in the databases both at national/international level.

› Access to the database for the authorities

› Safety Recommendations publicly accessible