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Trend in international discussion on safety regulation for Automated Driving System, etc.

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Automated Driving Systems (ADS) are increasingly recognized as a key solution to major social challenges, including the reduction of traffic accidents, the mitigation of driver shortages, and the maintenance of local transportation for elderly people especially in rural area. From an industrial view point, the automotive industry is an essencial sector in Japan, employing approximately 5.5 million people and undergoing a major transformation driven by automated driving and electrification. Establishing international regulations based on Japanese technologies or knowledge in this rapidly growing field leads to achieve strengthening global competitiveness of Japanese automotive industry.

Automated driving technologies are commonly defined using the five levels. Levels 1 and 2 require driver's assistance, as the driver remains responsible for monitoring the surrounding environment and vehicle operation. Level 1 provides either longitudinal or lateral support, while Level 2 provides both. Levels 3 and above are assumed to be responsible for driving tasks under specific situations. Level 3 allows drivers to disengage from continuous monitoring in limited situations, such as highway congestion, while requiring drivers to takeover the control upon request. Level 4 enables driverless operation within limited situations similarly as Level 3 operations, and Level 5 represents full automation without any limitations.

Under the Road Transport Vehicle Act, vehicles are not allowed to be used unless they comply with the Vehicle Safety Regulation relating to safety and environmental protection. To ensure safety throughout the vehicle lifecycle, Ministry of Land, Infrastructure, Transport and Tourism has conducted type approval system, required maintenance for users, conducted periodical inspections and instructed to recall when defects appears to be caused by vehicle design or manufacturering. In 2019, the act was amended to introduce the definition of the automated driving systems, expanded safety standards to cover such systems, enforced approval for over-the-air software updates, and strengthened requirements for specific maintenance, etc. Safety standards for Level 3 systems were clarified in 2020, and subsequent legislative reforms enabled the implementation of Level 4 automated driving. In 2024, additional guidelines were established to clarify acceptable safety levels and streamline approval procedures for Level 4 vehicles.

On the other hand, an internationally harmonized vehicle regulation for automated driving system has been discussed under the United Nations World Forum for Harmonization of Vehicle Regulations (WP.29), where Japan has taken a leading role. In 2020, international regulations have been adopted for Level 3 automated lane-keeping systems, as well as for cybersecurity and software updates. For Level 4 or more advanced automation, a new international regulation is expected to be adopted in upcoming WP29 meeting in June 2026. The new regulation is going to apply a safety case approach requiring manufacturers to demonstrate through structured claim, arguments and evidence that their systems pose no unreasonable risk while accommodating diverse system designs, including AI-based approaches. Furthermore, defining features of this new regulation is that it requires vehicle manufacturers to establish their safety management systems to ensure the safety of automated driving systems throughout their entire lifecycle, as well as to monitor the operation of automated driving vehicles and report major events to the relevant authorities in a timely manner.

Lastly, in phases where new technologies are being introduced into society, it is particularly important to ensure safety and to enhance social awareness and acceptance. Regarding the proposed new international regulation, close cooperation between the public and private sectors would be required for implement the system appropriately. It is essential that a shared understanding be established and that efforts to pursue safety be continuously maintained.

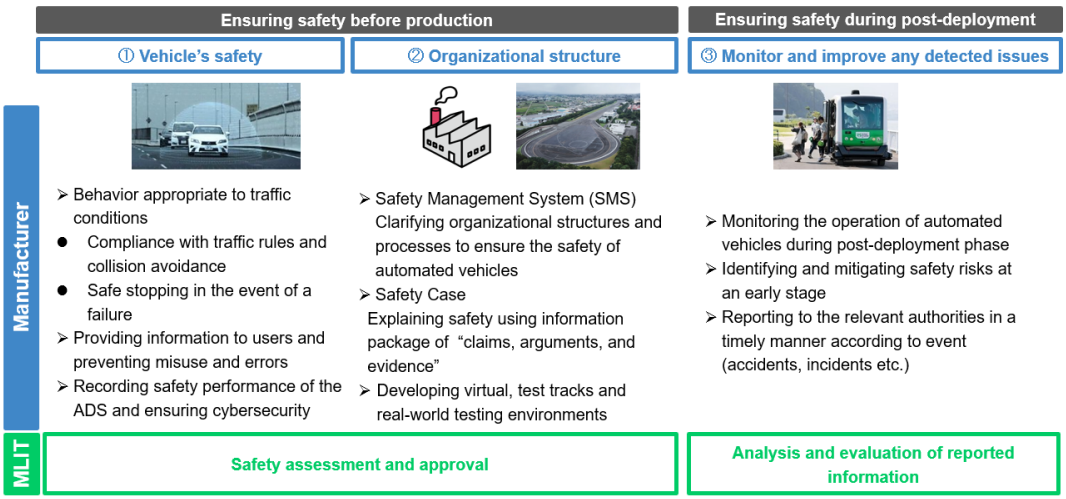

Fig.1 Overview of the proposed UNR for Automated Driving System