WELCOME TO PANEL SESSION

- EIWAC 2010 -

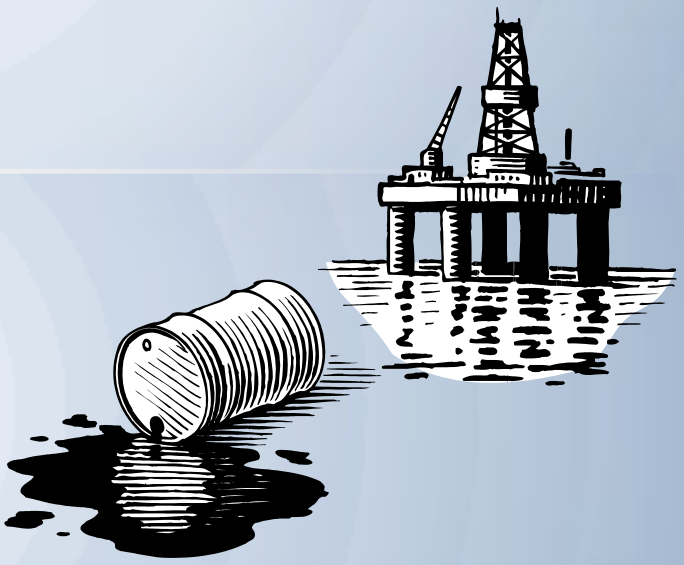
"FUTURE OF AUTOMATION IN AIR TRAFFIC MANAGEMENT AND RELATED INDUSTRIAL SYSTEMS"

Panelists

- **Shinji Suzuki** *(University of Tokyo)*
- **Peter Hecker** *(Technische Universitaet Braunschweig)*
- **Toshiyuki Inagaki** *(University of Tsukuba)*
- **Kimihiko Ito** *(Civil Aviation Bureau Japan)*
- **Yuji Hirao** *(Nagaoka University of Technology)*
- **Francisco Javier Sáez Nieto** *(University of Madrid)*

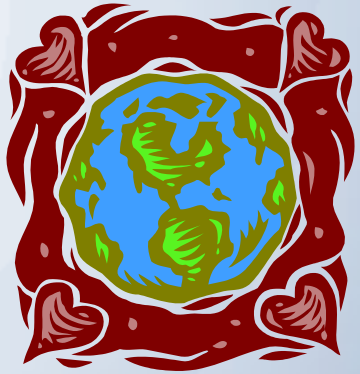
Future ATM, assisted by automated systems

- **Back ground of the Future ATM (1)**
  - Traffic Increase in airport/airspace
  - Reduction of operation cost



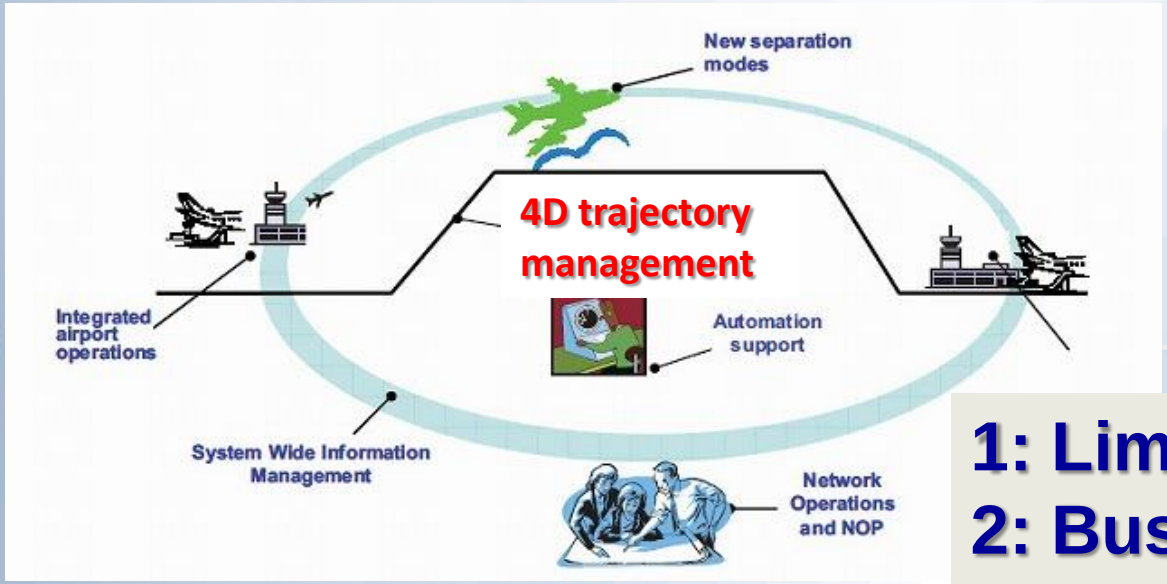
◆Back ground of the Future ATM (2)

- Reduction of environmental impact
- Increase safety
- Keep Competitiveness



In order to respond such demands for Future ATM …

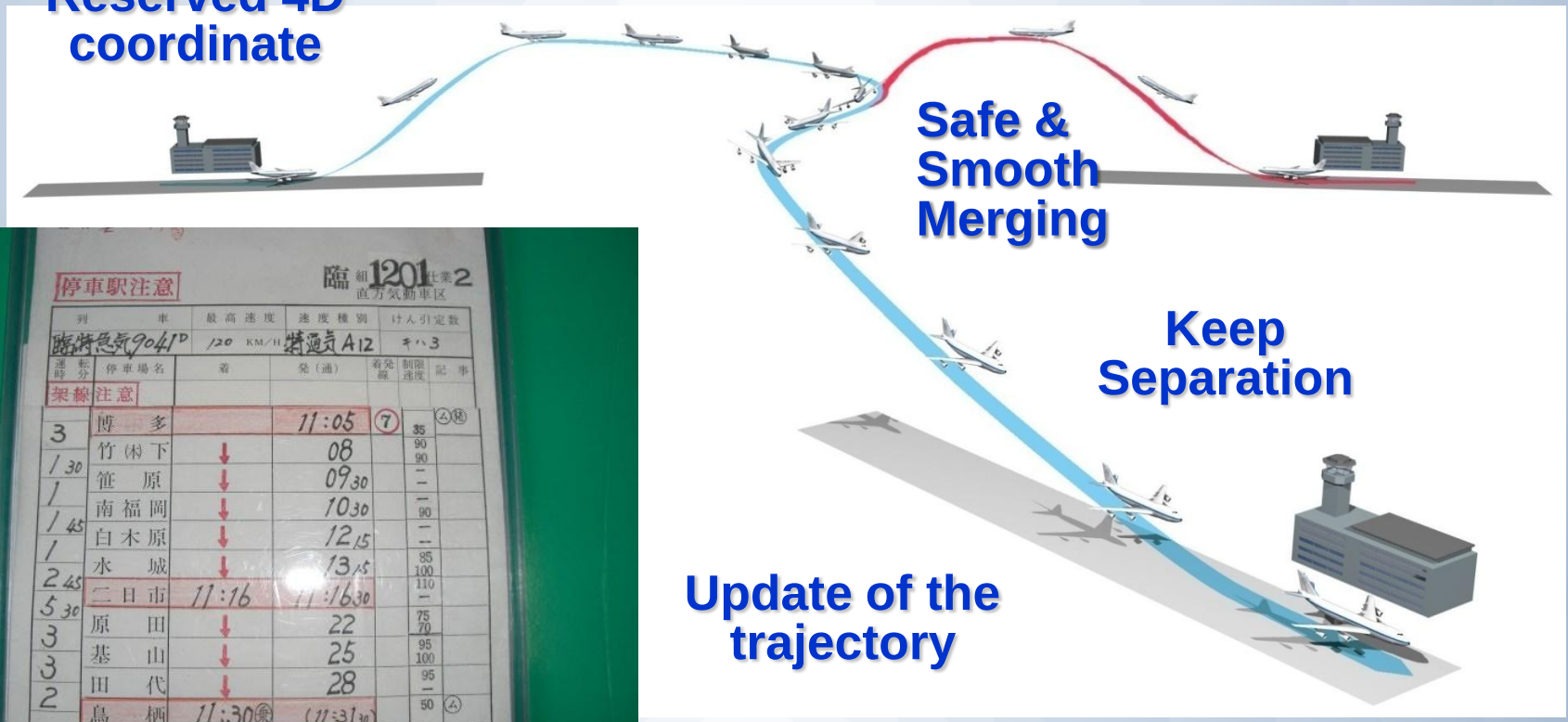
Trajectory Based Operation is a Key!



◆***SESAR Project***

1: Limited space & time
2: Business Trajectories
3: Information exchange
4: Separation assurance

What is Trajectory Based Operation?

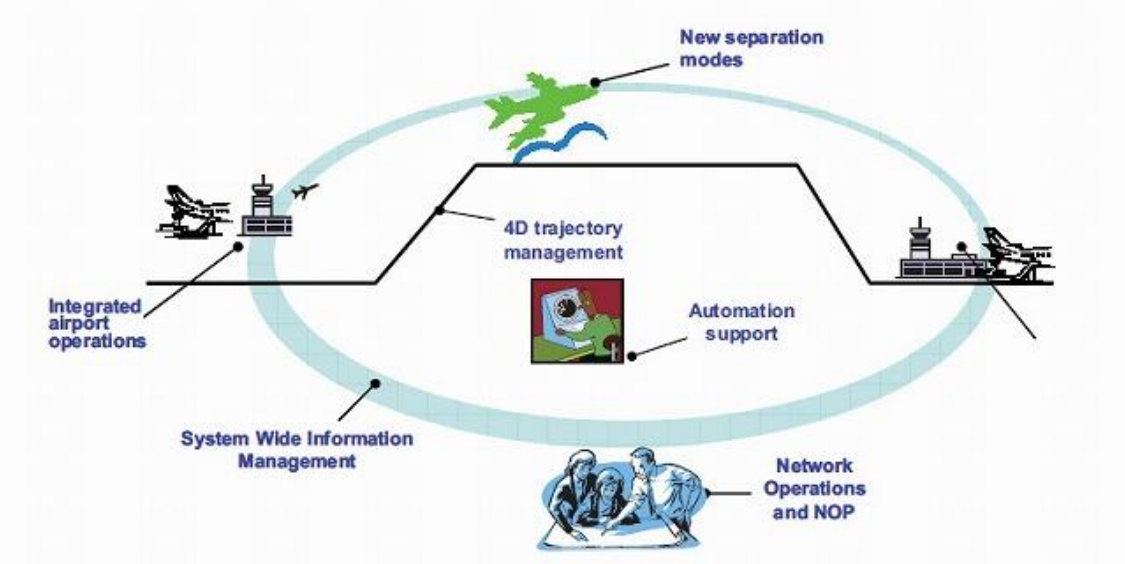


◆*Strict time based operation as train diagram*

✓*Accurate trajectory prediction*

To realize this Operation …

- **Common Data Exchange**
- **Integrated Operation Assistance**
- **Collaborative Decision Making**
- **Safety Management**



Adaptive to operational and technical variations

To attain the goals …

Automated System!

To introduce or develop such automated system …

The system must be safe no matter …

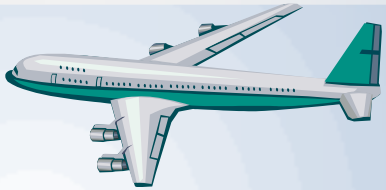
- **What have happened,**
- **Where the system is used,**
- **When the system is employed,**
- **How the system is used,**
- **Who uses the system.**

Other traffic system?

Present Status for Safety and Automation …

a. Safety: Philosophies and features of …

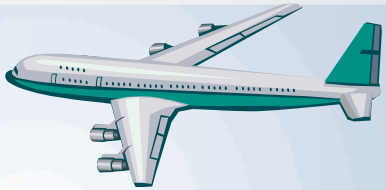
- Railway
- Automobile
- Aircraft
- Air operation



b. Present problems

To keep safety under the environment of introducing/ developing new technologies for …

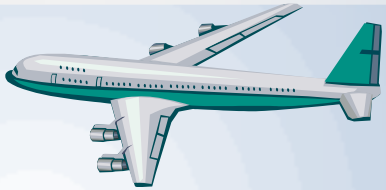
- Railway
- Automobile
- Aircraft
- Air operation



c. Prospect of Automation

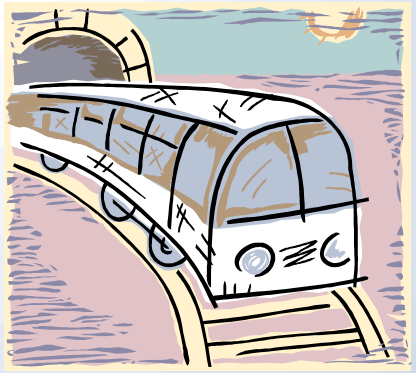
How to realize smooth introduction of automation to …

- Railway
- Automobile
- Aircraft
- Air operation



◆Practical applications of automated systems …

- No man train
- Automatic braking system
- UAV



Open discussion (1)

- **Other difficulties?**
- **Similarities in manufacture?**

Coffee/Tea break …

Will be back in 10 minutes …

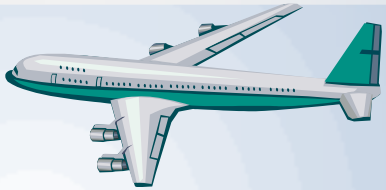
Refreshed?

Challenges to realize Future ATM

Be convinced of safety, risk analysis & estimation necessary in all traffic systems …

a. Risk analysis & estimation generally conducted in …

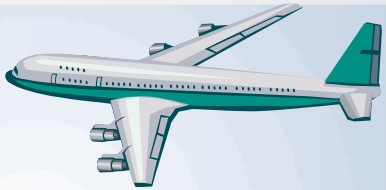
- Railway
- Automobile
- Aircraft
- Air operation



b. Another difficulty of risk analysis & estimation …

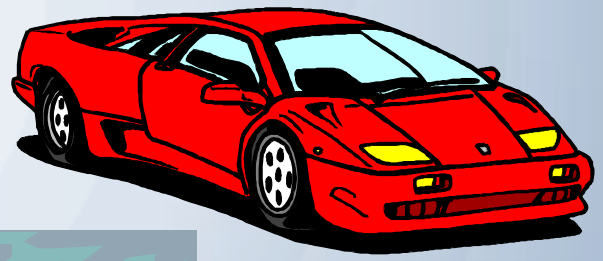
Human - Machine Interface (HMI) problems facing in …

- Railway
- Automobile
- Aircraft
- Air operation



◆Practical questions about HMI problems …

- Automobiles with new operation system
- Boeing & Airbus airplanes
- New ATC displays

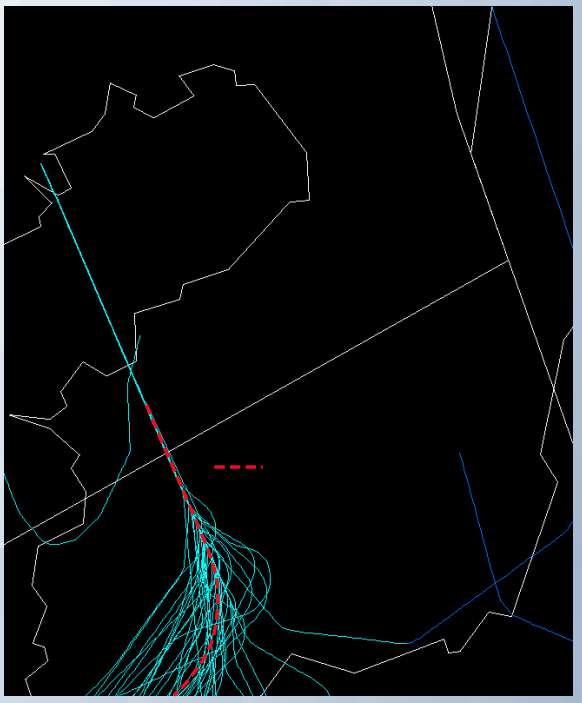


c. Task Sharing in future Air Operation …

Pilot, ATC, Operator, Airport

And …

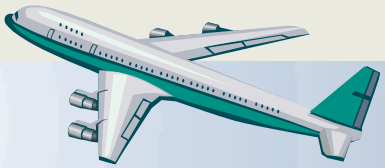
Man and automated system



Terminal Area Traffic

◆Questions …

- How to share a task among parties?
- Who is responsible for the total system?
- How to conduct “Collaborative Decision Making”?
- Possibility of fully Centralized System?



d. (Far) Future ATM Model …

Pilot, ATC, Operator, Airport etc.

- **Monitor** the total system normally.
- Appropriate and quick response to recover anomaly only in case of **impending hazards** …

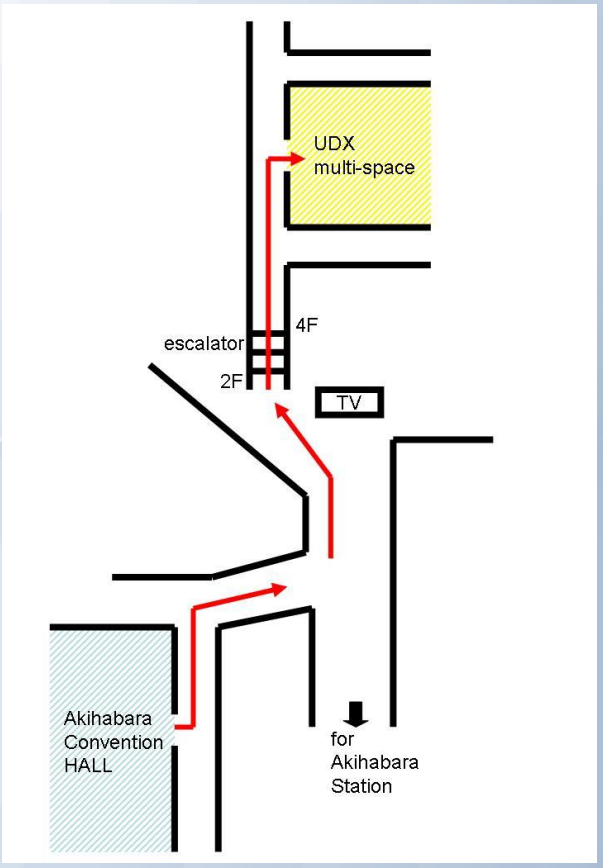
➢ **Is it our goal?**

Open discussion (2)

- **Question & Comment from other point of views?**
- **????**

Concluding Comments from All Panelists

- **Prof. Suzuki**
- **Prof. Hecker**
- **Prof. Inagaki**
- **Mr. Ito**
- **Prof. Hirao**
- **Prof. Nieto**
- ***Yamamoto***

Thank you very much for your attention and participation!

Welcome Session at UDX Building!