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HMI Adaptation, Real-time Flight Data/Status Synchronization and Major Operational Enhancements

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Objective

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- Brief History of ATM Automation in India
- HMI Adaptation, important aspects and issues
- Real-time Flight Data/Status Synchronization
- Major Operational Enhancements in India

Automation in India

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- First ATM Automation introduced in India in Mid 90's at Delhi & Mumbai (MATS-BD).
- Major Automation system being used in India
  - Ratheon Autotrac 2 / 3 / 3+ system
  - INDRA Automation System
  - Selex Automation System
- Delhi Automation under upgradation from Autotrac 3 to INDRA Automation
- Upgradation planned for Mumbai, Bengaluru and Hyderabad Automation System in near future.
- 44 Airports in India have ATM Automation System.
- Central Air Traffic Flow Management System(C-ATFM) with a setup of Command & Control Centre at Delhi.

HMI Adaptation

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- Digital graphical display of the Information (Radar display/ Flight strips etc)
- Complex process to adapt existing Airspace rules to ATM Automation
  - Objective
    - Optimize the situational awareness of Controller
    - Reduce Controller Workload
    - Needs to be simple, detailed and self-descriptive
    - Process to sync with User Roles & responsibilities
    - Balance Controller workload

HMI Adaptation

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- Automation of Routine & Mundane task to allow Controller focus on complex situation
- Good situational awareness & optimal workload leading to good user decision
- Controller focus on core task
- Appropriate safety alerts and timing.
- Focus on right information at right time and right place rather than more information

HMI Adaptation Issues

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- Too much information loses focus.
- High number of alerts misdirect user attention
- Technical limitation of System can lead to complex and user intensive procedures.
- Sometimes Automating a task may lead to extra burden on controller
- System design may lead to redefine user roles and responsibility

Real-time Flight Data/Status Synchronization

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- Automation permits multiple actions on same flight data occurring simultaneously by separate users.
- Each user requires updated status of the flight.
- Status update displayed via easily identifiable colour, symbol or text change
  - Change of PPS symbol for change in Radar update
  - Change in Color for Identification /Handover/Takeover/Coordination etc
  - Change of Flight levels / speed etc.
  - Sometime change accompanied with alert indicator(Radar data lost)
- Accurate updated display of information desired for all users
- Data synchronization critical when between users on different systems.
- Procedures to cater to System latency, data exchange delays between systems.

Major Operational Enhancements in India

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- Other operational and local procedures are realized through additional enhancements.
- Many improvements desired to cope up with operational requirements.
- Some operational improvements implemented in India
  - Security Clearances
  - AFTN Network
  - C-ATFM (Central ATFM)
  - Radar integration
  - DCL (Departure Clearance via data Link)
  - AMAN/DMAN
  - ACDM (Airport CDM)
  - Electronic Flight Strip
  - AIDC (ATS Interfacility Data Communications)

Thank you