



CC/ATCG/Operations/2022/06

27<sup>th</sup> July 2022

The Chairman  
Airports Authority of India  
Rajiv Gandhi Bhawan  
New Delhi-03



**Subject – Urgent need of Automation System**

Respected Sir,

CSMIA, Mumbai is currently second busiest airport in India. It had also become world's busiest airport to operate a single runway at a time in March 2017 surpassing London's Gatwick Airport, whose position was lost later due to falling passenger numbers by the end of 2019. A crucial factor behind this high number of operations is efficient Air Traffic Control being provided at CSMIA, Mumbai. However, Air Traffic Controllers rely on a state of the art automation system to provide such services which helps them in maintaining their tenable efficiency. This brings us to draw your attention towards the importance of such automation system which needs to be robust, reliable and infallible.

● **History of current Automation System & issues in CSMIA, Mumbai**

The hardware for current automation system deployed at CSMIA, Mumbai has grown old to 16+ years (where in one decade computer generation changes). Also, the procurement of the present system was done keeping mind the **number of surveillance sensors used during 2000s and traffic scenario of 1990s**. A lot has changed since then. Example - Mumbai Approach Control has only 3 workstations, whereas Chennai and Kolkata have more workstations.

The number of sensor feeds to the system has increased overtime, traffic has increased manifold, airspace structure has been changed, however all the changes done through software is being implemented on same hardware components (servers, workstations, recorders etc.) which had already been working on its peak capacity way back in 2010. To put into perspective, we have upgraded our laptops/system from 128 MB RAM to 4-8GB RAM in last 20 years. Had we been using our old system, we would not even be able to open a web browser or run a simple program.

As a result, over the last few months, the number of workstations/server failures have increased at a rapid rate, where the main problem is of hardware (processors, SMPS, heat sink assembly, displays, RAMs, HDDs etc.). The major issues are –

1. There is **no hardware support from the OEM**, that is **M/s Raytheon**. System hardware including networking infrastructure has become obsolete more than a decade ago, thereby leading to unavailability of spare parts in the market. Some of the hardware items such as SMPS, heat sink assembly, displays, RAMs, HDDs, display cards etc. are being procured locally to run the system and sustain operations.

2. Hardware items such as heat sink assembly, workstations, servers, hard disks etc. are failing frequently, leading to system freeze.
3. Both the recorders of Auto track-III (AT-III) main system showing multiple failures.
4. Flight strip printers which have been in use for more than a decade have developed wear and tear, leading to frequent failure.
5. Testing and certification of hardware items received from Delhi's old Raytheon Automation system is moving at snail's pace due to need of additional manpower. Also, since hardware items are not dependable, the issue escalates.
6. Load on Automation System have increased manifold due to additional sensors being fed as input to the system and increase in overall traffic (leading to large numbers of data fed for processing).
7. Maintenance is very difficult due shortage of manpower.

#### ● Local measures to sustain operations

- To reduce the load on system, few surveillance sensors have been disabled from the Automation System. Example – Udaipur's radar feed.
- Procurement of hardware items (such as SMPS, heat sink assembly, RAMs, displays etc.) through local vendors, compromising reliability and robustness of system as whole.
- Frequent review of contingency procedures to handle traffic in case of non-availability/degradation of Automation sub-system. ATC to plan flow control/arrival/departure restrictions to keep traffic load safely manageable with available workstations.

These above-mentioned are few measures but the list is not exhaustive.

- As per CNS Circular 04 of 2021, File ref no E10364 NM-16017/6/2021-CNS-O&M Point 2 – One of the audit findings made by DGCA while carrying out safety oversight audit of ATM/CNS Automation facilities at field station is, the continuous operations of ATM/CNS equipment/facilities beyond their defined stipulated tentative life span without ascertaining operational status of equipment as per some defined criteria/standard operating procedure. **The life span of Automation System is estimated to 10 years.**

This also requires immediate assistance from CNS department who are trained to handle the degradation (which requires training of at least 2-3 years). Also, their presence is essential for the time being till new automation system is in place, so that they can be called at odd hours (as they are marked for emergency duty 24x7 hours).

#### ● Immediate solutions proposed

CHQ, AAI to request OEM that is M/S Raytheon to provide hardware support for the existing system. Enhancement Contract Project (ECP) proposal with Raytheon to be expedited. New hardware from Raytheon with software support is the need of the hour.

Current Automation System works of Sun Solaris Architecture (UNIX based Operating System). However, request from Raytheon to be made for providing hardware support with Intel based Architecture. This new hardware will at least serve for 5 years. Also, software

update with support including annual maintenance contract (AMC) is required from Raytheon for at least 5 years. This process needs to be expedited.

Use of **Virtual Machines (VMs)** to be explored for immediate help to controllers, where dependency on old hardware can be reduced.

- **Long term solution proposed**

There has already been a tender floated for five airports namely Mumbai, Hyderabad, Bengaluru, Navi Mumbai and MOPA. Its timeline needs to be respected in all aspects of installation as well as use.

However, the procurement will take time due to certain stages involved such as-

- Opening for letter of credit
- Project Management
- Quality Analysis
- System Engineering
- Hardware specifications and Installation design
- Acquisitions
- Software customizations and Adaption data
- Final Acceptance Test
- Packaging and Shipment to Site
- Site training (On job Training)
- Site Acceptance Test (SAT)
- System reliability and stability testing
- Final Stage Acceptance Test
- Few more stages involved

To put into perspective, **procurement, installation, SAT, commissioning, training and parallel operation would take at least 4 years.**

If OEM that is M/s Raytheon provides hardware with software support including AMC (a package deal), then with the availability of new Automation System, hardware provided by Raytheon can be reused as a spare (as it would be based on Intel Architecture).

- ❖ Requirements as per tender document at CSMIA, Mumbai –

Control Working Position (CWP) where systems are needed can be enumerated as –

- 1) 3 supervisors (WSO, Area Supervisor, Oceanic Supervisor)
- 2) Radar Control (Total 24 in numbers)
- 3) Planning Control (Total 16 in numbers)
- 4) Alpha Control (Total 12 in numbers)
- 5) 1 FDO

Hence overall, 56-57 CWP (1 as spare) needs to be provided with requisite hardware like keyboards, mouse, speakers, strip printers, desktop KVM switch, digital console clock etc. varying in numbers depending on the positions.

**2) Developing Automation System in house under 'Make in India' programme like NAV CANADA.**

3) Developing Automation System in collaboration with BEL.

4) Always go for global tender route and purchase new automation system by the end of 10 years. Not to mention, procurement process to be initiated once 50% lifetime of system expires.

- **The big picture summarising the plight**

CSMIA, Mumbai being the 2<sup>nd</sup> largest Airport in India (in terms of number of aircraft movements being handled/number of movements being handled on single runway) and Mumbai being commercial hub of India, needs state of the art technology and hardware to be reckoned with its potential. If God forbids, the Automation System fails at any level, it is bound to attract international media attention and affect ICAO safety ratings. ICAO is set to audit India for its safety and standards as per its guidelines in November 2022, where it will be crucial to maintain the safety ratings and standards as any downgrade will not only impact number of movements from international community, but also financial aspects and jobs.

Aviation industry is expanding at a rapid rate in India, hence the requirement of number of Airports as being announced by Government of India. Also, CSMIA Mumbai will emerge as nodal hub because of its strategic importance as commerce hub. Hence, image of Airports Authority of India (in turn Civil Aviation in India/Government of India) is dependent on infallibility of Air Traffic Services being provided (which in turn is dependent in Automation System being used). It is important that international airlines keep flying our Indian Airspace to protect us from –

- Economic impact
- International trade and tourism loss
- Impact on cultural and commercial activities
- Job losses

COVID pandemic has already impacted aviation sector a lot, and even in those times essential activities of carrying medicine and cargo was being carried out through airlines such as humanitarian aid and relief missions. Therefore, to maintain the serenity of such crucial aspect, it is the need of the hour to provide the warriors with enough and efficient weapons where they at least stand a chance to provide world class services. As without robust Automation System, it will not be possible to track and separate air traffic which can bring unwanted, undesirable catastrophic events.

❖ **Log entries for substantial proof and data**

List of major hardware failures are mentioned as –

- **Oct 2020** – Around 20 failures of Main GPWS (General Purpose Workstation), Main CCWS (Control Controller Workstation), Main FDPS (Flight Data Processing System) hardware components which includes graphic card failure, server failure, failure of operating system (OS), SMPS failure, link to FDP failure, fan failures, emergency state indication, system in degraded mode, faulty fan tray etc.

Remedial action had been taken by replacing faulty components with local spare parts, by rebooting the system, by shutting down certain application etc.

- Sub-system failures related to CSMIA, Mumbai's Auto Track – III (AT-III) system –
  - **March 2022 to April 2022** – Approximately 25 failures of FDPS backup, RDPS backup, OP GPWS, VISONA display server, OPCCWS.  
Remedial action taken by changing RAM, replacing hardware machine with local spare part, changing HDD, re-starting subsystem etc. to sustain operation in all means.
- **Area Control Centre workstation** failed very frequently (system number - OPGPWS02) to the tune of **30 odd times** in the month of **March 2022**.
- **Oceanic Control Centre workstation** (system number – OPGPWS07) failed around **10 times** in the period from 20<sup>th</sup> March 2022 to 05<sup>th</sup> April 2022.

To put the things in perspective, there have been more than **70 subsystem problems, degradation and failure in Mumbai's Automation System** in the month of **June 2022** itself.

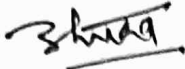
- Certain problems which need its own attention are –
  - Keyboard of GPWS not working
  - CCWS failure, display getting blacked out and coming to normal state after 3.5 hours
  - GPWS getting crashed
  - GPWS getting rebooted repeatedly
  - GPWS mouse not working – for this multiple complaints have been registered
  - CCWS is sluggish, showing extremely slow response
  - CPDLC messages are sluggish
  - MTCD functionality is not working in CCWS & GPWS system properly
  - Various CCWS position becoming red (showing non-working state)
  - GPWS failing abruptly – which reboots repeatedly
  - CCWS screen freeze
  - Many GPWS failing abruptly
  - GPWS system freeze
  - Flight Information Centre (FIC) not be able to acknowledge CPDLC message.

**With failed automation system, even with the presence of radar feeds, having to handle deviation which ranges to 100 miles it would not be possible to manage air traffic safely. And the service provision is bound to fail with loss of separation and compromise of safety. Any such failure to provide safe conduct of flights shall not be pinned on Air Traffic Controllers due to failure of automation system. It shall be failure on procurement of correct automation tools to achieve the objective of safe and efficient Air Traffic Services in Indian Sky.**

ATC Guild (I) as professional body requests your good office to address the issue of Mumbai Automation on urgent basis.

Assure you best cooperation.

Regards



(ALOK YADAV)

General Secretary

Copy- To

- Alm*  
*27/07/2022*
- 1- The Secretary, Ministry of Civil Aviation, Rajiv Gandhi Bhawan, New Delhi-03
  - 2- The Director General Civil Aviation, Opposite Safdarjung Airport, New Delhi-03
  - 3- The Member (ANS), Rajiv Gandhi Bhawan, New Delhi-03

*27/07/22*

महोदय नारायण सिंह O/o Dir Gen of Civil Aviation प्रति किया / RECEIVED
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