

DRAFT

Enclosure 5

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**Center for Advanced
Aviation System Development**

Nuevo Aeropuerto Internacional de la Ciudad de México

***Key Airspace and Procedure Design-Related Activities
(Updated)***

Prepared for

Servicios a la Navegación en el Espacio Aéreo Mexicano

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1. Introduction

The purpose of this document is to provide general information to Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM) on some of the key activities and milestones planned from September 2016 through the early fall of 2017, pertaining to the redesign of the Mexico City Terminal Maneuvering Area (TMA) to support triple independent operations at Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM). This document provides an update regarding activity and milestone information that was originally provided by MITRE in March 2016 (refer to MITRE document F500-L16-025).

The majority of the activities and milestones described in this document were discussed with officials from SENEAM during the airspace design workshop held in early August 2016. While this document attempts to cover as many of the key activities and milestones as possible, it is important to note that the redesign of the Mexico City TMA is a complex project that also involves investigative work. Therefore, it is difficult for SENEAM and MITRE to anticipate every single detail and activity that will need to be addressed. Thus, the items described below are as specific as possible, but still general in nature. Actual activities and milestone dates will be coordinated closely between SENEAM and MITRE, and updated and/or modified to address and reflect changes as the project progresses. It is also important to mention that many of the activities and milestones depend on the timely receipt of data from SENEAM as well as timely feedback in both directions between SENEAM and MITRE.

This document does not consider activities and milestones that must be conducted by SENEAM and other aviation authorities that are outside the area of MITRE's expertise and scope of work. For example, some important items that should be considered by SENEAM and other aviation authorities are:

- Assisting in the coordination of pre-runway construction flight inspections, which includes the acquisition of an appropriate Instrument Landing System (ILS)
- Workforce planning for staffing of controllers and other relevant essential support staff for NAICM. This includes establishing the current staffing situation and any constraints that may affect the transition of operations to NAICM.
- Assessing the current training capabilities and capacity to take account of the recruitment and training of controllers to support NAICM operations
- Acquiring Air Traffic Control (ATC) equipment, including the incorporation of the Final Monitor Aid (FMA), with appropriate lead-times in order to allow equipment to be ready for operation well in advance of NAICM's opening-day. Facilities to accommodate the equipment (e.g., Operations Room, Air Traffic Control Tower, etc.) must also be ready in time to install and test the equipment.

- Actual issuance of new regulations by the Dirección General de Aeronáutica Civil (DGAC) required to operate NAICM.
- Addressing any environmental or Safety Management System-related matters, as necessary

Next, coordination with other project stakeholders, such as the airlines and Fuerza Aérea Mexicana (FAM) is important. Regarding the airlines, MITRE contacted top executives of Aeromexico, Interjet, Volaris, and VivaAerobús regarding a visit to MITRE in September. At the time of this writing representatives from Aeromexico and Interjet have visited MITRE (22 September 2016) to discuss in great detail the NAICM project. The visit was very successful and useful. MITRE will attempt to identify other opportunities for representatives from Volaris and VivaAerobús to visit MITRE in the future.

Regarding FAM, it is important to integrate officials from FAM into the NAICM airspace work, and that FAM-related matters be closely coordinated with MITRE. MITRE expects to reconvene working on FAM-related matters, in coordination with SENEAM, DGAC, and other stakeholders, in upcoming months.

2. NAICM Key Activities and Milestones

The information below represents the key activities and milestones planned from September 2016 through early fall 2017 pertaining to the redesign of the Mexico City TMA. The list of activities is not in a specific order of priority, but it does consider a likely sequence in which activities may need to be conducted. As previously mentioned, actual activities and milestone dates will be coordinated closely between SENEAM and MITRE, and updated and/or modified to address and reflect changes as the project progresses.

September 2016 – October 2016:

- SENEAM to begin designing Area Navigation (RNAV) and conventional Standard Terminal Arrival Routes (STARs) for NAICM
- SENEAM to begin designing RNAV and conventional STARs for Toluca, as necessary
- MITRE to begin designing RNAV and conventional Standard Instrument Departures (SIDs) for NAICM
- SENEAM and MITRE to complete initial procedural separation of all routes within the Mexico City TMA
- MITRE to begin analyzing the enroute airspace based on the SENEAM-developed Performance Based Navigation (PBN) routes with the baseline sectors

November 2016 – December 2016:

- SENEAM to complete (by early November) designing RNAV and conventional STARs for NAICM
- SENEAM to complete (by early November) designing RNAV and conventional STARs for Toluca, as necessary
- MITRE to complete (by early November) designing RNAV and conventional SIDs for NAICM
- SENEAM to provide MITRE with the definitions of the RNAV and conventional STARs for NAICM and Toluca
- SENEAM to review and validate MITRE's approach procedures and SIDs for NAICM
- MITRE to provide SENEAM with the definitions of the RNAV and conventional SIDs for NAICM
- MITRE to complete analysis of the enroute airspace based on the SENEAM-developed PBN routes with the baseline sectors
- MITRE to complete initial flyability analysis of NAICM and Toluca procedures
- SENEAM and MITRE to begin initial sectorization of the Mexico City TMA and Mexico Area Control Center (ACC) enroute airspace
- SENEAM to simulate the new Mexico City TMA and Mexico ACC PBN procedures in their simulator. The objective of this is to evaluate the routes and procedures that have been designed in order to obtain operational feedback. Modifications to the routes and procedures can then be made based on any issues that are uncovered during the evaluation.

January 2017 – March 2017:

- MITRE to develop RNAV SIDs and approach procedures for Toluca
- SENEAM and MITRE to conduct an airspace design workshop to complete procedural separation of routes and Mexico City TMA and Mexico ACC enroute sectorization

- SENEAM to complete the simulation of the new Mexico City TMA and Mexico ACC PBN procedures in their simulator
- SENEAM to review and validate MITRE's RNAV SIDs and approach procedures for Toluca

April 2017 – June 2017:

- SENEAM and MITRE to refine the route procedural separation based on procedure designs
- SENEAM and MITRE to refine Mexico City TMA and Mexico ACC enroute sectorization
- MITRE to analyze the SENEAM-proposed PBN enroute structure with the new sectorization
- MITRE to analyze the Mexico City TMA procedures and new sectorization
- MITRE to analyze the SENEAM-proposed PBN enroute structure and new sectorization with increased traffic levels projected for opening-day operations
- MITRE to analyze the new Mexico City TMA procedures and new sectorization with increased traffic levels projected for opening-day operations
- SENEAM and MITRE to refine the Mexico ACC enroute and Mexico City TMA airspace design
- SENEAM to determine the preliminary number of air traffic controller positions needed to be acquired to support opening-day operations at NAICM

July 2017 – September 2017:

- SENEAM to inform MITRE of the planned ATC system being considered for the new Mexico City airspace environment to support NAICM. This information is essential so that MITRE can begin HITL simulation laboratory preparations.
- SENEAM to develop Visual Flight Rule, overflight, and helicopter routes for the Mexico City TMA that will be deconflicted with NAICM STARs, as well as approach and departure procedures

- MITRE to begin HITL simulation laboratory preparations
- SENEAM and MITRE to begin draft HITL scenario development

