

DRAFT

Enclosure 6

(Ref. Technical Letter F500-L16-059)



**Center for Advanced
Aviation System Development**

Dual Independent Test-Bed Operations at Cancún

***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 for September 2016 through early 2018, pertaining to the redesign of the Cancún/Cozumel Terminal Maneuvering Area (TMA) to support dual independent test-bed operations at Cancún. This document provides an update regarding activity and milestone information that was originally provided by MITRE in March 2016 (refer to MITRE document F500-L16-024).

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 Cancún/Cozumel 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 timely receipt of data from SENEAM as well as timely feedback in both directions between SENEAM and MITRE.

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

- Workforce planning for staffing of controllers and other relevant essential support staff for Cancún. This includes establishing the current staffing situation and any constraints that may affect handling dual independent test-bed operations at Cancún.
- Assessing the current training capabilities and capacity to take account of the training of controllers to support dual independent test-bed operations at Cancún
- 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 commencing dual independent test-bed operations at Cancún. Facilities to accommodate the equipment (e.g., Operations Room) 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 conduct dual independent test-bed operations at Cancún.
- Addressing any environmental or Safety Management System-related matters, as necessary

- Developing educational materials for pilots and others to ensure a smooth transition to dual independent test-bed operations at Cancún
- Performing required implementation activities for conducting dual independent test-bed operations at Cancún

Next, coordination with other project stakeholders, such as the airlines and Aeropuertos del Sureste (ASUR) is important. Note that airline-related matters should be closely coordinated with MITRE before links are established. This is because there is a linkage between the Cancún and NAICM work that should be appropriately coordinated.

2. Cancún Key Activities and Milestones

The information below represents the key activities and milestones planned from September 2016 through early 2018, pertaining to the redesign of the Cancún/Cozumel TMA. Dual independent test-bed operations are envisioned to commence in early 2018. 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:

- MITRE to complete conventional independent Standard Instrument Departures (SIDs) for Cancún
- SENEAM to complete the review of MITRE's draft report on initial Concept of Operations, Letters of Agreement (LOA), and Standard Operating Procedures (SOP) in support of upcoming Human-In-The-Loop (HITL) simulations (see enclosure 4 referenced to MITRE Technical Letter F500-L016-039, dated 30 June 2016). Comments should be provided to MITRE.
- SENEAM to complete analysis of Cancún aircraft ground flow matters considering dual independent operations
- MITRE to complete initial flyability analysis of Cancún procedures
- SENEAM to simulate the Cancún/Cozumel TMA and enroute 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.

- SENEAM and MITRE to complete initial procedural separation of all routes within the Cancún/Cozumel TMA
- SENEAM and MITRE to begin initial sectorization of the Cancún/Cozumel TMA
- SENEAM to begin designing conventional and Area Navigation (RNAV) Standard Terminal Arrivals (STARs), as well as RNAV SIDs for Cancún, as necessary
- SENEAM to begin designing conventional and RNAV STARs, as well as SIDs for Cozumel, as necessary
- MITRE to continue with HITL simulation laboratory preparations

November 2016 – December 2016:

- SENEAM to complete (by early November) designing conventional and RNAV STARs, as well as RNAV SIDs for Cancún, as necessary
- SENEAM to complete (by early November) designing conventional and RNAV STARs, as well as SIDs for Cozumel, as necessary
- SENEAM to review and validate MITRE's approach procedures and conventional SIDs for Cancún
- SENEAM and MITRE to finalize the initial Concept of Operations, LOA, and SOP document in support of upcoming HITL simulations
- SENEAM and MITRE to conduct an airspace design workshop to complete procedural separation of routes, Cancún/Cozumel TMA sectorization, and development of HITL simulation scenarios
- MITRE to continue with HITL simulation laboratory preparations

January 2017 – March 2017:

- MITRE to complete HITL simulation laboratory preparations

- SENEAM to begin familiarizing controllers that will participate in upcoming HITL simulation with dual independent arrival and departure operations
- SENEAM and MITRE to conduct a one-week dry run of the first HITL simulation of the Cancún/Cozumel TMA at MITRE's facilities. The dry run provides an opportunity to eliminate any issues that are present in the scenarios before the actual HITL simulation is conducted.
- SENEAM and MITRE to conduct a one-week HITL simulation of the Cancún/Cozumel TMA at MITRE's facilities. The purpose of the HITL simulation is to evaluate the new routes, procedures, and sectorization that have been developed to support dual independent test-bed operations.
- MITRE to begin examining results of the first HITL simulation

April 2017 – June 2017:

- MITRE to complete examining results of the first HITL simulation
- SENEAM to review results of the first HITL simulation, and make any airspace modifications, as necessary
- SENEAM and MITRE to conduct an airspace design workshop to discuss the overall results of the first HITL simulation, discuss any airspace modifications, and develop scenarios for the second HITL simulation

July 2017 – September 2017:

- SENEAM and MITRE to complete scenario design for the second HITL simulation
- MITRE to complete HITL simulation laboratory preparations
- SENEAM and MITRE to conduct a one-week dry run of the second HITL simulation of the Cancún/Cozumel TMA at MITRE's facilities. The dry run provides an opportunity to eliminate any issues that are present in the scenarios before the actual HITL simulation is conducted.
- SENEAM and MITRE to conduct a one-week second HITL simulation of the Cancún/Cozumel TMA at MITRE's facilities. The purpose of the HITL simulation is to evaluate the new routes, procedures, and sectorization that have been developed to support dual independent test-bed operations.

- MITRE to begin examining results of the second HITL simulation

October 2017 – March 2018:

- MITRE to complete examining results of the second HITL simulation
- SENEAM to review results of the second HITL simulation, and make any airspace modifications, as necessary
- SENEAM to complete all implementation activities required to commence actual dual independent test-bed operations at Cancún