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**Subject: Technical Letter: Summary of Work During the Period 1 April 2014 through 30 June 2014**

Dear Capt. López Meyer:

This letter respectfully submits to your attention a summary of the most significant project activities conducted by MITRE during the period 1 April 2014 through 30 June 2014. Along with this technical letter, four enclosures are included. Each one is identified and briefly described below:

- **Enclosure No. 1: Helicopter Routes Between Nuevo Aeropuerto Internacional de la Ciudad de México and Santa Lucía Military Base – Preliminary Report.**  
This report describes MITRE's analysis to determine the feasibility of developing low altitude Visual Flight Rules (VFR) helicopter routes between Santa Lucía Military Base (Santa Lucía) and the proposed Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM). The objectives of this analysis were to determine whether Fuerza Aérea Mexicana (FAM) helicopter operations on those routes can be operated independently from operations at NAICM, as well as what restrictions and potential requirements would need to be considered.  
  
Those results also take into consideration valuable aeronautical and Air Traffic Control (ATC)-related feedback that was obtained during a visit to MITRE by experts from Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM) on 5 June 2014. That visit is further described later in this document.
- **Enclosure No. 2: Photogrammetric, Satellite-Based Survey of the Texcoco Area and Its Surroundings – Site Assessment Report.** MITRE is responsible for the procurement of a satellite-based survey of the Texcoco area and its surrounding areas. In the late April/early May timeframe, a team of survey experts from MDA Geospatial Services Inc. (MDA) visited Mexico City for a one-week period to perform a survey project kick-off meeting with officials from ASA, as well as a site assessment. The purpose of the site assessment was to gather data, specifically Ground Control Points (GCPs), to assist in the development of the survey. MITRE

pre-coordinated the visit details and its objectives. This enclosure describes that work.

MITRE wishes to express its gratitude to you, as well as Ing. Jorge Nevárez and his team for supporting this important work.

- **Enclosure No. 3: Photogrammetric, Satellite-Based Survey of the Texcoco Area and Its Surroundings – Satellite Image Acquisition Completion Report.** MITRE is glad to report that all of the satellite-based imagery required to conduct the above-mentioned survey have been successfully acquired. More importantly, the images were acquired without clouds.

This is an important achievement as it was critical to acquire appropriate cloud-free imagery before the rainy season commenced. As a result, the MDA team can now advance on the next steps of its work. For example, MDA utilized the imagery to support its field ground truth visit, which took place during the period 8-20 June 2014. A description of that visit is provided later on in this document.

This enclosure provides an overview of the satellite image acquisition areas, specifications, as well as illustrations of the satellite images that were acquired of the Texcoco area and its surroundings.

- **Enclosure No. 4: Analysis of Potential Airport Sites in the State of Hidalgo – Preliminary Findings.** A large team of MITRE experts has been conducting intense analyses of six potential airport sites in the State of Hidalgo: Tepeji del Río-Tlahuelilpan (Tepeji del Río), Tulancingo, Zempoala, Apan, Tetepango, and Actopan-Santiago de Anaya (Actopan). The goal of MITRE's investigation is to assist ASA, officials from Hidalgo, and other stakeholders, in selecting the three best sites (out of six) for the development of an airport. Those three selected potential airport sites will then be investigated further by MITRE.

The objective of this enclosure is to describe the overall preliminary findings of MITRE's exploratory investigation of the six potential airport sites. Those findings also take into consideration valuable airspace and ATC-related feedback that was obtained from SENEAM during its above-mentioned 5 June 2014 visit to MITRE.

Once the three potential airport sites are selected, appropriate weather and obstacle data will need to be collected through Automated Weather Observing Systems (AWOS) and a detailed satellite-based photogrammetric survey.

It is important to mention that officials from the State of Hidalgo expressed interest in visiting MITRE during May or June to discuss MITRE's Hidalgo-related work. However, in the end the officials were unavailable during that timeframe. Additionally, efforts were made to coordinate a visit to MITRE by officials from FAM during June/July to discuss both Hidalgo and Santa Lucía matters, but they were also not available. MITRE hopes that officials from the State of Hidalgo and FAM visit MITRE soon to avoid a project delay.



## Other Activities

The following list describes additional important activities conducted by MITRE during this reporting period:

- On 28 April 2014, yourself and Ing. Iván Galán, Director of the Technical Co-operation Bureau of the International Civil Aviation Organization (ICAO) visited MITRE. The primary reason for the visit was to present MITRE's NAICM-related aeronautical work to Ing. Galán and to discuss important operational and safety issues of concern regarding Santa Lucía and NAICM interactions. A visit to MITRE's Air Traffic Management (ATM) laboratory was conducted as well, which included demonstrations of scenarios of interactions between operations at Santa Lucía and NAICM.

The visit was extremely beneficial to both MITRE and Ing. Galán, who then analyzed on his own the interaction situation. As a result, Ing. Galán prepared a document that expresses fundamental agreement with MITRE's position (and SENEAM's previous recommendation) that Santa Lucía's runway should be closed, along with the Base's associated Special Use Airspace (SUA).

- In early May 2014, MITRE assisted ASA in the preparation of a technical briefing regarding NAICM and Santa Lucía interaction matters. The briefing was to be used by Lic. Gerardo Ruiz Esparza, the Secretary of Communications and Transportation, for a presentation to top third parties.

The objective of that presentation was to explain MITRE's and ICAO's strong recommendation to close Santa Lucía's runway, along with the Base's associated SUA. The briefing also included information on potential Base relocation plans being considered to facilitate FAM operations (e.g., fixed-wing training and maintenance operations at Querétaro Airport or a new airport in Hidalgo; transport operations at NAICM; and finally, helicopter arrivals and departures at Santa Lucía).

- As requested by Ing. Nevárez, the MITRE team reviewed a technical proposal submitted to ASA by Rossbach de México S.A. de C.V. describing the Vaisala's AWOS being considered for installation at the three potential airport sites to be selected in the State of Hidalgo. MITRE sent a document to ASA on 15 May 2014 (MITRE letter F500-L14-026) that provided comments on that proposal. Additional information on other important considerations that should be addressed by ASA early on, such as construction work items, land acquisition or leasing matters, and other installation recommendations was also included. That document is also being sent along this Technical Letter, as a reference.

Once Rossbach provides a revised technical proposal to ASA, please forward it to MITRE for review prior to ordering the system. This will help ensure that ASA is obtaining an appropriate AWOS for the Hidalgo sites. Note that it is important that appropriate AWOSs be ordered very soon so they can be installed in a timely

manner at each of the three potential airport sites once they are selected later this summer.

- On 28 May 2014, MITRE submitted a document entitled *Potential Hidalgo Airport Sites: Preliminary Boundary Areas* to Lic. José Pablo Maauad, Secretary of Economic Development of the State of Hidalgo. The document includes information regarding the preliminary exploratory boundary areas of potential airport sites being examined by MITRE. The information is intended to be used by the State of Hidalgo in conducting preliminary non-aeronautical investigations of the potential airport sites to identify issues that could impede airport construction. That document is being sent as a reference, along with this Technical Letter (MITRE letter F500-L14-028).
- On 4 June 2014, MITRE submitted to Lic. Manuel Ángel Núñez for his information a summary of the critical aeronautical steps pertaining to the NAICM project that was included in MITRE's previous work summary technical letter to ASA (MITRE document F500-L14-030). MITRE would like to reiterate the importance for ASA to use the critical steps document as a guiding document, to avoid delays. Additionally, MITRE sent to Lic. Núñez the above-mentioned document entitled *Potential Hidalgo Airport Sites: Preliminary Boundary Areas* (MITRE document F500-L14-031). Both of the two above-mentioned documents are being sent along with this technical letter as a reference.
- MITRE has continued to communicate and coordinate appropriately with officials at SENEAM to keep them aware of and engaged in key project matters and activities.
  - MITRE discussed the Santa Lucía and NAICM interaction issues and concerns, as well as runway closure and Base relocation matters with SENEAM to ensure they understand plans being considered.
  - On 19 May 2014, MITRE sent to Ing. Claudio Arellano, Director-General of SENEAM, and CTA. Rodolfo Olivares, Subdirector-General of Air Traffic Services, a summary of the critical aeronautical steps pertaining to the NAICM project. This information was provided so that SENEAM is fully aware of important upcoming activities, many of which require direct and strong participation of that organization. That document is being sent along with this technical letter (MITRE document F500-L14-027), as a reference.
  - MITRE provided information to SENEAM regarding the manufacturer of the type of specialized Instrument Landing System (ILS) equipment that is required for conducting the long final approaches envisioned for NAICM.
  - MITRE sent to SENEAM in late March 2014 a report on preliminary runway spacing and ATC-related equipment requirements pertaining to conducting dual independent approaches at Cancún, entitled *Independent Approaches to Two Runways at Cancún* (MITRE document F500-L14-



022). ASA received this document previously. The report enables SENEAM to start making arrangements for the acquisition and/or development of appropriate equipment and systems to support dual independent operations at Cancún. This will also allow Cancún to serve as a test location so that air traffic controllers can obtain an understanding of issues associated with independent operations and gain experience for the future implementation of such procedures at NAICM. However, MITRE is unaware of any actions taken so far by any party regarding this matter. It is important that SENEAM investigate this matter further as the acquisition and integration of equipment is a time consuming process.

- MITRE met with SENEAM on 5 June 2014 at MITRE's facilities to discuss Hidalgo- and Santa Lucía-related work. Additional details on that visit are provided below.
- Two experts from SENEAM visited MITRE on 5 June 2014 for a full day of detailed presentations and discussions regarding MITRE's Hidalgo- and Santa Lucía-related work. The two experts were CTA. Rodrigo Bruce Magallón, Director of Air Traffic, and CTA. José Arturo Enríquez, Centro México Supervisor. The visit by the officials from SENEAM was critical in order to obtain important aeronautical and ATC-related feedback. As a result, SENEAM is now fully aware of key findings and issues, as well as other important project matters.

Prior to the above-mentioned visit, the MITRE team conducted numerous complex aeronautical analyses, and prepared several highly detailed technical briefings and demonstrations covering its Hidalgo and Santa Lucía work. This required an extensive effort and preparation by the MITRE team.

The following is a listing of the briefings and demonstrations provided by MITRE to SENEAM during the visit:

- Overview of the Hidalgo Airport Siting Project
- NAICM - Overview of MITRE's Airspace Design
- Santa Lucía and NAICM Interactions: Operational Safety Issues and Concerns
- Exploratory Analyses of the Potential Hidalgo Airport Sites – Part I
- Visit to the ATM Laboratory: Flight Demonstration, including the Tepeji del Río potential airport site in Hidalgo.
- Mexico's Air Traffic Controller Training Prototype: Demonstration
- Exploratory Analyses of the Potential Hidalgo Airport Sites – Part II
- Potential Hidalgo Airport Sites: Feedback and Opinion

- Helicopter Operations at Santa Lucía in Conjunction with NAICM Operations
- FAM Fixed-Wing Training Operations at Querétaro Airport: General Discussion

The visit was very successful and the feedback provided by the SENEAM experts was extremely valuable. MITRE also discussed the previously-mentioned summary of critical aeronautical steps pertaining to the NAICM project with CTA. Magallón and CTA. Enríquez.

One of the most important opinions provided by CTA. Magallón and CTA. Enríquez during their visit was regarding their order of preference of the potential airport sites in Hidalgo from a strictly aeronautical point of view (identical to MITRE's opinion despite the fact that each team, SENEAM's and MITRE's, discussed their preferences independently). SENEAM's potential Hidalgo Airport site order of preference was as follows:

1. Tulancingo
2. Tepeji del Río – Runway Option 1 (north-south oriented runway)
3. Tepeji del Río – Runway Option 2 (northeast-southwest oriented runway)
4. Zempoala
5. Apan

A document summarizing the key feedback provided by CTA. Magallón and CTA. Enríquez during their visit on MITRE's recent Hidalgo- and Santa Lucía-related aeronautical studies was sent to CTA. Olivares for his information (Ing. Arellano and you were copied as well). That document is being sent along with this technical letter (MITRE letter F500-L14-032).

It is important to mention that the visit by CTA. Magallón and CTA. Enríquez was combined with a visit to MITRE's Advanced Air Traffic Controller Training laboratory. This was pertaining to a separate project that could assist with NAICM tasks later on.

- A team of survey experts from MDA travelled to Mexico City for the two-week period 8-20 June 2014, to perform field ground truth work. The main objective of the visit was to physically measure objects greater or equal to 60 m Above Ground Level (AGL) in Area B of the survey (i.e., the area within a range of approximately 10 to 45 km from the Texcoco area). MITRE pre-coordinated the trip details and its objectives.

The trip was extremely successful and the team was able to accomplish all of its objectives. MITRE wishes to thank ASA for its support and assistance in facilitating the work by the survey team. A report documenting the field ground truth visit is being prepared and will be submitted during the next reporting period.

- Due to the necessity to close Santa Lucía's runway, one option is to relocate all FAM fixed-wing maintenance and training operations, along with its support



facilities, to another airport, possibly Querétaro Airport. Therefore, MITRE has been advancing on its analysis of integrating FAM's fixed-wing military operations at Querétaro Airport. This work also includes the examination of SUAs for training purposes and the establishment of corridors to transition to and from the airport and the associated SUAs.

The above-mentioned visit by SENEAM provided valuable feedback regarding MITRE's approach to conducting the Querétaro Airport analysis. However, it is critical that MITRE discuss this work further with FAM officials in order for its work to appropriately advance. As previously mentioned, MITRE hopes that FAM officials can visit MITRE soon to discuss Querétaro Airport and other important matters.

- As mentioned in MITRE's previous work summary Technical Letter, MITRE agreed to examine (despite being out of scope) the feasibility of new helicopter training areas to be recommended by FAM officials. FAM was to send to MITRE the coordinates of those areas by 25 February 2014, four months ago, for MITRE's immediate analysis. MITRE, however, has not received to-date any information nor has received an explanation as to why the information was not sent.
- MITRE is responsible for the procurement of a satellite-based survey of the three potential airport sites in the State of Hidalgo once they are selected. In anticipation of this requirement MITRE has already started to conduct and coordinate technical and contractual preparatory activities and discussions with MDA. This will allow MITRE and MDA to advance at a quick pace so that survey work can commence as early as possible.
- ASA requested that MITRE examine the impact of the following proposed construction projects on future NAICM operations:
  - Feasibility of an Auditorium near El Caracol
  - Feasibility of Comisión Federal de Electricidad (CFE) powerline
  - ARUP-proposed runway shift (i.e., Runway 5, as counted from west to east)
  - Feasibility of a new water tank and examination of an existing water tank, north of the Texcoco site

In the case of the auditorium, MITRE has made numerous attempts to try and obtain appropriate data from the State of México (Edomex) in order to examine the auditorium. Unfortunately, the data that has been provided to MITRE has been incomplete and/or contradictory. Recently, MITRE was able to talk to the Edomex engineer who is in charge of the auditorium project to clarify data matters and issues. MITRE was expecting to receive information from Edomex that would allow it to proceed with its examination of the auditorium. However, the appropriate information has not been sent to MITRE yet. The Secretary of Public Works and Water of Edomex, Ing. Manuel Ortiz, is planning a trip to Washington to discuss the whole matter on 30 June.

In the case of the CFE powerline, MITRE is awaiting confirmation from ASA that the part of the powerline that runs along the western boundary of the NAICM site will be fully underground. Additionally, MITRE is waiting for information from ASA regarding plans to continue the powerline from the eastern side of El Caracol to the northeast towards Teotihuacán.

In the case of the ARUP-proposed runway shift, for MITRE to conduct this examination it is important that it receives information regarding plans to continue the powerline from the eastern side of El Caracol to the northeast towards Teotihuacán since it could affect Runway 5, and potentially Runway 6.

In the case of the water tanks, MITRE is waiting for confirmation from ASA that there are no other structures nearby, associated with the proposed water tank facility that have an elevation higher than the top of the water tank.

Please do not hesitate to contact me if you need any clarification or any other assistance.

Sincerely,



Ing. Robert W. Kleinhans  
Project Technical Coordinator

Enclosures: 4

cc: Dr. Bernard Lisker