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Subject: Special Technical Letter: Assessment of Proposed Relocation of Fence at NAICM per CONAGUA's Request

Dear Capt. López Meyer:

This document is in response to your conversation in early June with Dr. Bernardo Lisker regarding a request by the Comisión Nacional del Agua (CONAGUA) to relocate the western boundary fence at the Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM). CONAGUA, as it is understood by MITRE, asked the Dirección General de Aeronáutica Civil (DGAC) whether the fence relocation is possible. Specifically, CONAGUA asked you to investigate if the currently planned fence running along the western property boundary¹ may be relocated 100 m to the east (i.e., the fence closest to the westernmost runway) to allow for the development of new CONAGUA facilities west of the fence.

Per your request, MITRE evaluated during the past few weeks the potential impact to aeronautical operations of the relocated fence, including the evaluation of key obstacle assessment surfaces in relation to the relocated fence. MITRE's assessment was performed for both the MITRE-Recommended Runway Configuration (July 2012) and for Arup's preferred Option 2 runway shift proposal, which entails the shifting of runways 1 and 2 (as counted from west to east) a distance of 10 m to the west and the shifting of runways 3, 4, 5, and 6 a distance of 10 m to the east.

Due to the orientation of the runways at NAICM, the closest point to the fence is at the southern end of runway 1. The distance from the currently proposed fence to the centerline of runway 1 is 507 m for the MITRE-Recommended Runway Configuration (July 2012), and 497 m for Arup's preferred Option 2 runway shift proposal. For the relocated fence, the distances are 407 m and 397 m, respectively.

¹ The western property boundary is shown in an AutoCAD drawing provided to MITRE by Aeropuertos y Servicios Auxiliares dated 8 May 2015.

Methodology

MITRE assessed whether or not the relocation of the fence has the potential to impact key instrument approach and departure procedures, International Civil Aviation Organization (ICAO) Annex 14 Obstacle Limitation Surfaces (OLSs), and other important aeronautical considerations. More specifically, MITRE evaluated the impact of the relocated fence against all of the ICAO Annex 14 OLSs. The relevant surfaces within which the fence falls are the Transitional Surface for runway 1 and the Inner Horizontal Surface.

With regard to instrument approach and departure procedures, MITRE assessed potential impacts to Category (CAT) I Instrument Landing System (ILS) final and missed approach segments, CAT II/III ILS final and missed approach segments, conventional Standard Instrument Departures (SIDs), Required Navigation Performance Authorization Required (RNP AR) approaches, and Parallel Approach Obstruction Assessment Surfaces (PAOAS).

For this assessment, MITRE assumed that the maximum height of the fence would be approximately 6 m (20 ft) Above Ground Level (AGL). This is a conservative estimate to provide a buffer in case a taller fence or barrier is installed, as guidance provided by the United States Transportation Security Administration (TSA) recommends a fence height of 9 ft (consisting of 7 ft of chain-link plus an additional 2 ft of barbed wire). MITRE accounted for terrain elevation in the vicinity of the fence using photogrammetric survey data acquired in late 2014.

It is important to note that with regard to Arup's preferred Option 2 runway shift proposal, MITRE's assessment was limited in scope in that MITRE did not fully design instrument procedures for this option. Rather, MITRE investigated the potential impact of the relocated fence on OLSs and instrument procedures for Arup's preferred Option 2 runway shift proposal by examining key surfaces and areas, and/or considering surfaces that were generated during previous work pertaining to the MITRE-Recommended Runway Configuration (July 2012).

Findings

MITRE has concluded that if the fence were to be relocated 100 m to the east, the fence itself would not cause an aeronautical impact on ICAO Annex 14 OLSs and key instrument approach and departure procedures, as mentioned above. For example, while the fence may fall within the lateral confines of some surfaces, it does not penetrate any of the surfaces. Also, as mentioned above, the relocated fence would be approximately 397 m from the centerline of runway 1 (considering Arup's preferred Option 2 runway shift proposal, which represents the closest distance between the runway and relocated fence), which is clear of the Runway Strip (which is 150 m from the runway centerline).

MITRE also considered the potential development by CONAGUA of new facilities to the west of the relocated fence. Such assessment is very complicated. This is because numerous obstacle assessment surfaces, which have varying slopes and dimensions, must be considered. The relocated fence lies within the lateral confines of many of these surfaces, and therefore each new facility must be individually examined to determine its

allowable height. This is due to the fact that facility height limitations along the relocated fence line may vary. Factors such as the proposed location and height of the new facility, as well as ground elevation at the new facility must be considered. MITRE, therefore, advises that DGAC use great caution, as moving the fence can bring about secondary problems.

Closing Remarks

While MITRE has determined that the fence can be relocated 100 m to the east, MITRE is concerned that if the airport boundary (currently collocated with the fence) is also relocated 100 m to the east, it would be more difficult for aviation authorities to control new facility development in an area that would then be outside airport property. If development is not controlled and limited, tall structures in this area could impact aircraft procedures and operations and affect aeronautical feasibility. Additionally, new development that may act as a wildlife attractant (e.g., birds) or present a hazard to aircraft operations should be prohibited. Therefore, MITRE strongly recommends that the airport boundary itself (as opposed to the fence) not be relocated, so as to preserve aviation authorities' control over future development in this area.

Importantly, if CONAGUA is granted permission to develop new facilities adjacent to the airport along the relocated fence, it is critical that all development be closely coordinated with Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM) and MITRE before any decisions are made, to ensure compatibility with aircraft procedures and operations. This is due to the above-mentioned complexity of the multiple obstacle assessment surfaces that need to be evaluated.

Finally, MITRE recommends that airport planners and other stakeholders consider the impact of a relocated fence as well as any CONAGUA-related facility development in this area on overall airport design plans.

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

Sincerely,



Ing. Robert W. Kleinhans
Project Technical Coordinator

cc:
Dr. Bernard Lisker