

# FAA William J. Hughes Technical Center

## **Airway Facilities Tower Integration Laboratory (AFTIL)**

*“A Planning Tool for Enhanced  
Tower Siting”*

### Introduction

Planning for Airport Traffic Control Tower (ATCT) construction projects typically requires compromising between land availability and acquisition, design, siting preferences, and height determination studies. Historically, these issues were individually managed to get an acceptable location and insure adequate airfield visibility. The FAA now has a facility that can simulate potential sites in a realistic ATCT cab, using airfield siting photographs and aircraft simulations. By combining all aspects of ATCT operations in one simulation facility, a much more complete evaluation of potential ATCT sites can be accomplished. The AFTIL combines all aspects of ATCT siting with state-of-the-art visual projection. It is located in Building 170 at the FAA's William J. Hughes Technical Center (WJHTC) in Atlantic City, NJ. The AFTIL is sponsored by the NAS Transition and Implementation Program (ANS-1), Terminal Facilities Division (ANS-200), Terminal Facilities Programs (ANS-240) and maintained by the ATC Engineering and Test Division, Tower/FSS Branch (ACT-220). The AFTIL consists of two separate sections, co-located in the same building, a full-scale Mock-up Lab and a Control Tower Cab Simulation Suite (CSS). Each of these sections can operate independently or in tandem to create a realistic ATCT environment.

### Mission

The AFTIL's primary mission is to provide a platform to support and evaluate the interior design and layout, site selection, orientation, height determination studies, and transition of equipment into the ATCT environment.

### Cab Simulation Suite



The CSS contains a large six-foot vertical by 240-degree horizontal out-the-window display area, a control tower wrap-around console, tower support equipment, and a voice controlled aircraft simulation system. The CSS can display any airport using panoramic photographs and/or computer generated graphics, and can include any planned airport construction such as hangars, terminals, runways, or taxiways. The AFTIL can create a 3-dimensional airport along with shadow study printouts from new control tower locations. These airports and shadow studies can be used to evaluate



potential tower sites and determine if clear and unobstructed views of the airport surfaces and approach paths are available from the various tower control positions. Additionally, this computer airport model can be used for depth perception studies and evaluations of various console heights and angles.

The CSS can also simulate aircraft movements to and from the airport for a complete enhanced tower evaluation. ATC procedures associated with future airfield changes can be evaluated in a real-time environment. The CSS provides an optimum operational environment for identification and resolution of transition issues associated with the implementation and integration of ATCT systems and equipment. The CSS is also a viable testbed to study airport capacity issues such as runway acceptance rates and alternate approach-departure sequencing. The CSS is capable of demonstrating airport procedures developed to assist in solving runway incursion issues.

#### Mock-up Facility



The Mock-up Lab contains a 51' x 60' assembly area which can contain a full-scale ATCT cab or TRACON room configuration. Adjacent to this area is a complete carpentry shop used to fabricate the full-scale interior plywood and foamcore sections, which fully replicate the proposed ATCT cab or TRACON consoles. These lightweight sections are easily movable to arrange the cab interior. Replicas of ATCT

cab equipment (i.e. D-Brite, VCS, ASOS, RVR, etc) are available for controllers to place in desired locations. After initial placement, controllers walk through and evaluate the layout for suitability before the ATCT cab design is completed. This mock-up allows controllers and managers to arrange the workspace and to position radio, radar, weather, and support equipment in the most appropriate locations before cutting holes in the real console. This valuable tool has served to create an optimum work environment for air traffic controllers. The Mock-up Lab routinely fabricates finished consoles for ATCTs in addition to the full-scale mock-ups. The largest ATCT assembled in the mock-up area is the 1015 square foot Chicago O'Hare ATCT. Recent mock-ups include: Port Columbus Tower (604 sq. ft) Champaign-Urbana Tower (380 sq. ft) Orlando Tower (850 sq. ft), Santa Ana Tower (525 sq. ft), Bradley TRACON, Northern Georgia TRACON, Northern-Cal TRACON, Boston Consolidated TRACON, Potomac Consolidated TRACON and Merrill Field Tower.

For more information about:

- ATCT Cab Simulation Suite
- Airfield Simulation Development
- A Tool for FAA ANI Implementation Centers
- ATCT Siting Issues
- Runway, Taxiway, Terminal, and Ramp Visibility
- Visual Orientation of the Airfield
- ATCT Cab Design and Layout
- ATCT Equipment Transition

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