August 30, 2017

From: William E. Payne, P.E.
To: Colorado Division of Aeronautics

Section A – Blended Airspace/Remote Air Traffic Control Contract Progress Report #13

Re: Period: August 1, 2017 through August 30, 2017

Remote Tower Project Narrative:

Searidge has provided a draft site survey (see attached). They have preliminarily identified sites for the 360° mid-field camera array and the two-distributed camera located toward each end of Runway 15-33. The center field camera array will provide a 360° view of the local airspace and traffic pattern as well as the location for the light gun. The two distributed cameras will provide view of the runway ends that will overlap the centerfield cameral array and a view up the arrival/departure end of each runway. The center camera and two distributed camera masts will have pan-tilt-zoom (PTZ) cameras that will be taskable by the controllers.

Searidge is in the process of developing the airfield light gun that will be mounted on the center camera array. The light gun will be used by the controllers to communicate instructions to aircraft that are either not equipped with a two-way radio or are experiencing radio failure. The light gun will be slaved to one of the PTZ cameras tasked by the controller via a pointing device such as a mouse, track ball, joy stick, etc. The light gun should also be capable of automatically tracking a specific target either on the ground or in the airspace once a specific target has been designated.

The Searidge human machine interface (HMI), a key component of any remote tower system, is the platform by which controllers can change the view of the airfield or the runway surface, select a specific camera view, move the track based display or zoomed video display from one monitor to another or as a picture-in-a-picture on a selected monitor, as well as a variety of other tasks.

Another key element of the system proposed by Searidge is its ability to track visual targets based on pixel analysis technology, designate the target with a predetermined symbol such as a diamond, square or box and display the target on the controller's video display. The system must also have the ability to associate a tag generated by the radar data from the Standard Terminal Radar System (STARS) automation platform and display it on the video out-of-the-window view displays.

During Initial discussions with Searidge both prior to and after their selection as the vendor of choice, they indicated a desire and willingness to include electronic flight strips as a supporting technology to be evaluated as part of the project. Inclusion of electronic flight strips would have further cemented the Colorado Remote Tower Project as a premiere innovative NextGen project and distinguish it from other remote tower projects. Searidge has since indicated that they would not be including electronic flight strips as part of the system due to a perceived possible risk to the program. Searidge did indicate that they might be willing to include the system at a later date as an add alternate.

As a safety mitigation, the FAA has required a temporary or mobile ATCT be operational during the active and passive testing phases of remote tower certification at Leesburg, Virginia. They have indicated the same would be required at FNL. In order to assist FNL and support the program goals, I have been working with Serco, the Federal Contract Tower contractor for this region, to determine the budgetary cost associated with deploying a mobile ATCT (MATCT). The initial estimate for a service to provide ATC services via the MATCT is $813,000 per year. This assumes the tower would be in operation 12 hours/day, seven days/week and would require 5 controllers to support this operation. This also includes the controllers, the MATCT and $100M insurance. This is only an estimate at this time, as Serco is waiting for a final quote from its insurance carrier. Therefore, the final number is subject to change.

1.0 Program Description/Background

Phase III, remote airport traffic control tower is a unique NextGen concept that is the logical next step from those begun in Phases I, II and III of the Colorado Surveillance Project to enhance safety and optimize efficiency at selected Colorado airports.

Tasks:

1. Concept of Operations

Effort this Period: A high level outline of the Concept of Operation was provided by Searidge at the meeting on Tuesday, July 25th. This outline is based on the proposed Searidge system configuration.

The Concept of Operations will be modified by Searidge and the remote tower team in the upcoming months. It is expected that a fairly mature Concept of Operations will be complete by the end of September 2017.

2. Concept of Use

Effort this Period: This activity has not yet begun

This activity will begin after a system has been approved. Given the dynamic nature of the ConOps process, there may be no need for the ConUse document as it will be folded into the ConOps as a result of the test program.

3. Safety Analysis

Effort this Period: This activity has not yet begun.

This activity cannot start until the remote tower system is installed, optimized, and controllers are on the team.

4. Requirements Document

Effort this Period: The requirements document included in the RFI is one of the controlling project documents and will be the basis to ensure that the Searidge system performs as necessary to meet the requirements for system certification. The final document will be required to support preliminary and critical design reviews.

2.0 Project Scope

Task Narrative:

Vendor evaluation and selection.

1. Pre-implementation – Complete.

   Effort this Period: Searidge Technologies, headquartered in Ottawa, Canada, was selected as the prime vendor to implement the Colorado Remote Tower Project at the Northern Colorado Regional Airport. Searidge has executed the Other Transaction Agreement (OTA).

3.0 Tasks Supporting the Scope of Work

William E. Payne serves as the Program Manager, attending all project meetings as the technical representative for the Division of Aeronautics to ensure that the project meets the requirements of the Division and Colorado airports, and will monitor the project budget as necessary.

Task Narrative:

Searidge has completed a preliminary site survey report, which is attached. Following the project kickoff meeting the week of July 24, 2017, Searidge has elected not to include electronic flight strips as part of the Northern Colorado Regional Airport remote tower system.

The team briefed the FAA Western Service Area (WSA) on August 25, 2017. For the most part, the program is supported by the WSA who identified certification of the non-federal track based display as a program risk. This was expected, as there currently is no FAA process to certify a non-federal radar display.

Searidge is proposing to certify their Enhanced Airport Vision Display System (EAVDS) as a track based display. According to the Searidge , the EAVDS will provide “radar like” tracking based on STARS data.

Because track based display of STARS data is a key element of the Colorado remote tower operational concept and as the EAVDS is not certified for use in the NAS, this represents a program risk. For that reason, I have initiated talks with Leidos (formally Lockheed Martin) and Raytheon to provide a backup strategy should the EAVDS system run afoul of the FAA certification process.

4.0 Pre-Implementation

Task Narrative:

Tasks:

4.1 Evaluate Searidge’s technical approach.

Effort this period: Searidge has presented a high level operational concept, proposed system architecture and control room/controller workstation configuration for consideration. The proposed control room configuration (see last month’s report) including the video wall will require a fairly large area (32’ X 32’ +). This will not represent a problem as the facility at FNL is more than adequate in size. This could present a challenge in the future if one or more airports were to be consolidated in a single facility.

4.2 Participate in System and configuration design.

4.2.1 Review and approve the Searidge proposed system configuration.

Effort this period: Review of the Searidge operational concept, system configuration and system requirements based on the information presented by Searidge during the program kickoff meeting the week of July 24th.

4.2.2 Attend the Post Award Conference, First Article Testing (FAT) and Technical Interchange Meeting (TIM).

Post Award Conference: Complete

Effort this period: The project kickoff meeting held on July 25, 2017 served as the Post Award Conference and is complete.

Technical Interchange Meetings and Factory Acceptance/First Article Testing activities have not been scheduled. In addition to FAT a configuration control board (CCB) will begin evaluation of the proposed system’s technical configuration after the system architecture is accepted.

4.3 Finalize the following:

4.3.1 Concept of Operations (ConOps). The ConOps is the controlling document describing the concept of the project and methods to support the concept.

Effort this period: Searidge has provided a high level operational concept that in the coming months will be integrated into the program Concept of Operations and will become part of the final remote tower Concept of Operations.

4.3.2 Concept of Use (ConUse) – The ConUse document describes how the ConOps is to be used by the controllers as it relates to the Controller Handbook (FAA Order 7110.65).

Effort this period: No activity this period

If a ConUse document is required, it will be fully developed when the system functional capabilities are identified.

4.3.3 Requirements Documents (RD) – The RD describes a minimum set of capabilities for the system, airport, changes and adaptations to existing systems employed to support the ConOps.

Effort this period: No activity this period.

With the selection of Searidge as the vendor, the Requirements Document will be finalized to conform to the specific requirements of the Northern Colorado Regional Airport based on the completed site survey.

4.3.4 Safety Risk Management Document (SRMD) – The SRMD is the controlling document that permits the system to be operated in the NAS, delineating hazards and the mitigation of those hazards.

Effort this period: No activity this period.

The SRMD process will begin when the system has been installed and adapted to the FNL environment and a Safety Risk Management Panel (SRMP) is identified.

4.3.5 Develop System Configuration and Test Plan.

Effort this period:

Searidge has provided a system configuration for review by the team. The test plan will be developed by the NextGen team and Searidge in the coming months.

5.0 Implementation:

Implementation Narrative:

Implementation/installation of the system will begin upon approval of the site survey report and completion of the Preliminary Design Review (PDR).

Tasks:

5.1 Program meetings and associated travel.

Effort this period: Site survey was conducted the week of July 24, 2017.

Program Implementation meetings will start post review and acceptance of the Searidge site survey report and PDR.

5.2 Vendor/FAA Site Survey

5.2.1 Attend site survey activities and review final site survey report.

Effort this period: Initial Site Survey is complete and the preliminary site report is attached.

5.2.2 Review and approve infrastructure requirements.

Effort this period: A preliminary list of infrastructure requirements has been identified below. The infrastructure requirements identified after the site survey the week of July 24, 2017 are:

- Airfield – Camera masts
  - Power – single phase 208v
  - Telecommunications – single mode fiber optics
- Control room facility
  - Power – single phase 208v
    - Emergency generator
    - Battery UPS
  - Telecommunications
    - Commercial circuits (voice and data)
    - FTI circuits to support track-based data and FDIO

Finalization of infrastructure requirements will occur after review of the Searidge Site Survey Report an infrastructure design plan, which is expected by the end of September. Searidge is in the process of engaging CH_2M Hill, the airport Engineer, to provide site engineering services associated with the system infrastructure.

5.3 System Implementation and Equipment Deployment.

Effort this period: No activity this period.

System implementation and equipment deployment will begin after conclusion of PDR and CDR.

5.4 Certification Criteria Development.

Effort this period: This activity will begin in late September.

There are two primary certifications required for this project to become certified to provide VFR control services at FNL:

- System Equipment Certification – The FAA must certify the remote tower equipment as non-federal assets. The two major elements requiring certification are:
  - Video cameras and displays
  - Track-based display
- System Functional Certification – The "system" must be certified to provide airport traffic services.

Development of the certification criteria will commence at the completion of CDR and PDR. Certification criteria of the equipment and function will not begin until the Searidge system is installed and optimized.

5.5 Safety Risk Management Document (SRMD): Participate in the Safety Risk Management Panel (SRMP) development of the SRMD.

5.5.1 Develop Physical Hazards Analysis (PHA).

Effort this period: No activity this period.

The PHA development will begin when the SRMP is established.

5.5.2 Develop System/subsystem Hazard Analysis (SSHA).

Effort this period: No activity this period.

The SSHA development will begin when the particular system is determined and the SRMP is established.

5.5.3 Provide feedback to the SRMD based on PHA and SSHA compliance with requirements.

Effort this period: No activity this period.

This task will begin during system evaluation and after the SRMP is constituted.

5.6 System Certification: Participate in the Certification Inspection.

Effort this period: No activity this period.

System certification activities will begin at the conclusion of the testing and evaluation period.

5.7 Initial Operating Capability (IOC) Tasks: Attend meetings and activities leading to IOC and meetings and activities subsequent to the Operation Readiness Decision (ORD) and commissioning of the system.

Effort this period: No activity this period.

5.8 Entreat the FAA to include the Northern Colorado Regional Airport's (FNL) acceptance into the Federal Contract Tower (FCT) Program subsequent to certification of the remote tower system into the NAS.

Effort this period: Meetings with the FAA COO and the Executive Director of Policy and Plans is scheduled the week of August 28, 2017 to promote inclusion of FNL into the Federal Contract Tower Program. Inclusion of the Northern Colorado Regional Airport into the FCT program will be faced with two hurdles: first, the remote tower system currently under development at FNL must become certified, and; second, at this time the FAA has a moratorium on accepting new applications into the program.

6.0 Project Milestones – Will correlate with FAA schedules.

Effort this period: The NextGen team has proposed high level Project milestones.

7.0 Remote Tower Project Deliverables

7.1 Site Survey and Report – Vendor

Status: Preliminary Report has been submitted for review (see attached).

7.2 ConOps – FAA NextGen-WEP&A

Status: Draft ConOps complete finalization of ConOps will begin after the remote tower system is determined.

Reference discussion above.

7.3 ConUse (if required) – FAA NextGen-WEP&A

Status: The draft ConUse document is in the process of being evaluated. The final determination if a ConUse document is required will be made by the FAA Requirements Group. Reference discussion above.

7.4 Requirements Document – FAA NextGen

Status: The RD will be complete after the Searidge system configuration has been accepted.

7.5 FAT and SAT reports – Vendor and FAA NextGen

Status: Awaiting final system configuration acceptance.

7.6 SRMD – FAA NextGen-WEP&A

Status: Pending final system configuration identification.

7.7 IOC and ORD activities – FAA

Status: Pending project implementation.

7.8 Final written project report – WEP&A

Status: Pending project completion.

7.9 Monthly Progress Report to the Division of Aeronautics detailing the progress on each task and the anticipated activity moving forward.

Status: Current and ongoing.

Section B - Unmanned Aerial Systems (UAS)

Section Narrative:

The Division was asked to assist CDOT Right-of-Way Mapping in obtaining a Part 107 Waiver to allow mapping of the South Parker Road and Havana intersection. This waiver was necessary because CDOT did not want to close the intersection during the mapping and Part 107 does not permit UAS operation within 500' of persons not participating in the flight activity.

The FAA has rejected the waiver request due to insufficient safety mitigations. A meeting has been scheduled with the UAS Program Office the week of August 28, 2017 to review the decision.

The CDOT Certificate of Waiver or Authorization (COA) 2015-WSA-123-COA is scheduled to expire in November 2017, if not renewed. This COA has been superseded by the CDOT Blanket COA 2016-WSA-102-COA, see below.

FAA FORM 7711-1 UAS COA Attachment
Blanket Area Public Agency COA
2016-WSA-102-COA

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO
Colorado Department of Transportation

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED
Operation(s) of small Unmanned Aircraft System(s) weighting less than 55 lbs., in Class G airspace at or below 400 feet Above Ground Level (AGL) under the provisions of this authorization. See Provisions.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE
N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate, 2016-WSA-102, is effective from May 12, 2016, through May 11, 2018, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative. Should a renewal become necessary, the Proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 45 business days prior to the requested effective date.

BY DIRECTION OF THE ADMINISTRATOR

FAA Headquarters, AJV-115 (Region)	Scott J. Gardner (Signature)
May 12, 2016 (Date)	Acting Manager, UAS Tactical Operations Section (Title)

FAA Form 7711-1 (7-74)

Version 1.1 April 25, 2016

Section C - Enhance Situational Awareness for Non-Towered Airports

Section Narrative:

I continue to work with the FAA and Mitre Corporation to develop a Level-of-Service for enhanced air traffic services for airports to include remote towers. The result of this study will be a recommendation of ways to provide enhanced air traffic services to smaller, less active airports with limited FAA participation.

ATTACHMENT

1. Draft Site Survey prepared by Searidge.