

FREQUENCY ENGINEERING REQUEST

EQUIPMENT AND ANTENNA LOCATION

GMF S/N		REGIONAL S/N	
FREQUENCY	1030 MHz	EMISSION	6M00M1D
STATION CLASS		DATE ENTERED INTO SYSTEM	

Submit To Frequency Management

Detailed Instructions Below

☒ NEW FACILITY
 ☐ RELOCATION
 ☐ CHANGE
 ☐ DELETE

REQUEST DATE: 10-07-2014 DATE REQUIRED: 12-30-2014
 ORIGINATOR: Advanced Navigation & Positioning PHONE: 541-386-1747 x221
 ROUTING SYMBOL _____ PROJECT/JOB Truckee

FACILITY:

Type of Facility ADS ID TRK
 Location Truckee, CA Control Station Truckee, CA
 Hours of Operation 24 Service Area Radius in Miles 25 nms
 Generic Location On airport property
 General Comments ANPC is a manufacturer of air traffic surveillance products. This test site is needed to support the development of surveillance products for international and future domestic markets. (see Addendum)

TRANSMITTER:

Manufacturer EM Research Model Number NYKEMPA101
 Type of Facility (VOR, DME, COM, etc.) Beacon
 Type of Modulation:

☐ AM ☐ FM ☒ PULSE: Rate 1 Hz Width 800 +/- 100ns

Number of Channels 1 Bandwidth/Deviation 1030 MHz +/- 100 ppm

Power Output 125 Watts ERP.

TRANSMIT ANTENNA:

Manufacturer Era, a.s. Model: AL1W-ES0142A00001 Type: Omni
☐ Directional ☒ Non-Directional Polarization _____ Azimuth _____
 Latitude N 39 19' 11.500518 Longitude W 120 08' 57.97668
 Site Elevation (MSL) _____ ft. Antenna Height 5855.741ft. (MSL) Gain 3 db

RECEIVER:

Manufacturer: Era, a.s. Model Number RO7-ES195A00015
 Receiver Location: See attached sheet Co-located With _____

RECEIVE ANTENNA:

Manufacturer: Era a.s. Model Number: AL1W-ES0142A00001
☐ Directional ☒ Non-Directional Polarization _____ Azimuth _____
 Latitude: 39 19' 11.50185 Longitude: W120 8' 57.97575
 Site Elevation (MSL) _____ ft. Antenna Height 5854.5ft. (MSL) Gain 3 db

Receiver Antenna Locations

Number	Location	RX antenna coordinate - RTK Survey (deg min sec)		
		Latitude (N)	Longitude (W)	Elevation (m)
GS00RX	TRK - Airport Hanger	39°19'11.50185"	-120°8'57.97575"	1784.129
GS01	Alder Hill	39°21'9.092376"	-120°11'43.291002"	2054.856
GS02	Lookout Trail	39°15'46.348602"	-120° 8'48.708366"	2443.336
GS03	Dry Lake	39°19'14.707488"	-120°6'14.749122"	1934.536
GS04	Martis Peak	39°17'39.4452"	-120° 2'37.886778"	2426.772
GS05	School House	39°21'46.889634"	-120°6'00.218124"	1795.001

Justification

The Advanced Navigation and Position Corporation, Inc. (ANPC), a manufacturer of navigation and surveillance equipment, seeks to utilize an FCC licensed, 1030 MHz interrogator at Truckee-Tahoe airport. This interrogator is manufactured by EM Research, but is now out of production. Consequently, ANPC is developing its own 1030 MHz Mode A/C/S interrogator for FCC licensing and is studying the performance, profiles and design requirements of the EM Research interrogator to aid in its own design efforts. ANPC will evaluate the design and performance of this system, e.g. range, coverage, transmitter antenna performance, network geometry, interrogator design, receive antenna performance and design, tracking reliability, rate controls, response formats, rate of returns, differences in avionics performance, etc. with the intent of identifying potential improvements and defining requirements for its own system design,

ANPC is experienced in utilizing interrogators with its own Wide-Area Multilateration (WAM) system developed for the DOD, but this system uses a single medium-powered interrogator combined with centralized receiver antenna array in a small foot print (100'). The company would like to develop a low-powered interrogator optimized for localized, distributed antenna systems such as that used in the Airport Surface Detection Equipment (ASDE-X) and the Colorado WAM systems. Truckee already has a distributed receiver antenna system in place thereby offering ANPC a low-cost means to test a low-powered interrogator. This will enable ANPC to investigate, in addition to the above, the use and control of hemispherical or sectorized antennas to assist in minimizing FRUIT and optimize response rates. Truckee also provides a unique environment to test a low-power interrogator due to the surrounding terrain imposing limited line-of-sight and potential challenges indicative of those locations where multilateration is most desirable, e.g. Colorado.

Finally, the Truckee site has previously been evaluated and approved by the FAA for a low-powered 1030 Mhz interrogator and that installation has proved to be non-invasive to national airspace system (NAS) systems or operations. The existing interrogator at Truckee-Tahoe airport will be removed and returned to the FAA. ANPC's interrogator will operate at the same exact location and within the same bounds and parameters approved for the previous interrogator.

In terms of FTA duration, ANPC will need time to evaluate the environment and performance of the EM Research interrogator, design, develop, test and certify its own design, and evaluate this system against new ADS-B avionics being developed and deployed in the NAS in response to the 2020 ADS-B out mandate. Based on the time ANPC estimates it will take to conduct the tests mentioned above, and design and certify (FCC) its interrogator, ANPC would like the FTA to extend until the ADS-B mandate in 2020.

FAA NGT#: 150002

FAA Conditions for Approval

1. Maximum authorization is for 2 years.
2. The authorization is only to be used for the testing and development of a multilateration system (which includes 1030 MHz interrogation and 1030 MHz antenna and equipment, and multiple 1090 MHz receive antennae and associated receiver and processing equipment as specified above).
3. The authorization is only to support the development of equipment to be marketed and sold for direct foreign sales.
4. Unless the equipment/technology is reviewed/certified/approved for use by the FAA, the equipment/technology is not to be marketed/sold within the United States.
5. Unless a rule making to 47 CFR Part 87 is initiated/completed through the FCC, marketing/sale of the equipment to non-federal entities is prohibited within the United States.
6. Ownership and operation of the equipment is limited to ANPC.
7. At the conclusion of the experimental license, ANPC shall remove all 1030 MHz transmitters from the Truckee location.

ANPC has reviewed and understands the FAA conditions for FTA approval.