APPENDIX A

FAA Aircraft Substitution Requests

ESA Airports

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Tampa, FL 33607
813.207.7200 phone
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www.esassoc.com

technical memorandum

date June 27, 2018

to Cayla Morgan, FAA

from Autumn Ward, CM

subject Proposed AEDT 2d Aircraft Type Substitutions

reference Snohomish County Airport/ Paine Field Supplemental Environmental Assessment (EA)

ESA is assisting Alaska Airlines, United Airlines, Inc., and Southwest Airlines Co. with the preparation of a Supplemental EA for Operations Specifications amendments and an amendment to a 14 CFR Part 139 Certification to allow Alaska Airlines, United Airlines, and Southwest Airlines and their partners to initiate service to Snohomish County Airport/Paine Field (PAE). The Supplemental EA is being prepared with the Aviation Environmental Design Tool (AEDT), Version 2d. Upon evaluating the aircraft fleet mix at PAE, two aircraft were identified from the calendar year 2017 aircraft operations recorded in FlightAware.com that do not have a direct AEDT type.

The Boeing 747 Dreamlifter, which is also known as the Boeing Large Cargo Freighter (BLCF), is a modified version of the Boeing 747-400 Freight aircraft. The aircraft is a converted Boeing 747-400 with an enlarged fuselage and a swing-tail cargo door. According to readily available information, four civil aircraft were modified and are exclusively operated for the Boeing Company (transporting Boeing 787 Dreamliner aircraft components). This specific aircraft variantis not present in the AEDT 2d aircraft database. After reviewing the engine noise and airframe characteristics of aircraft present in the AEDT Fleet Database, it is recommended that the 747-400F with PW4056 engines be approved an appropriate substitute for the BLCF. Engine noise and airframe characteristics for the 747-400F, as well as available information on the BLCF, are presented in **Table 1**.

Table 1
Aircraft Characteristics and FAA Noise Certification Data

Aircraft Data[1]						**Noise (EPNdB)[2]**		
Manufacturer	**Aircraft Model**	**MTOW (lbs)**	**MLW (lbs)**	**Engine Type**	**Thrust (lbs)**	**Takeoff**	**Side-Line**	**Approach**
Boeing	747-400F	875,000	652,000	PW4056	56,750	101.6	99.7	104.7
Boeing	747-400 LCF	803,000	652,000	PW4062	63,300	NA	NA	NA

1. FAA's Advisory Circular 36-1H for Boeing 747-400F; The Boeing Company 747 Dreamlifter Fact Sheet; http://www.flugzeuginfo.net/acdata_php/acdata_boeing_747lcf_en.php.
2. https://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/, Appendix 1
Notes:
MTOW = Maximum Takeoff Weight
MLW = Maximum Landing Weight
NA = Information not available.
Noise levels for the Dreamlifter are not available in FAA's Advisory Circular 36-1H.

ESA requests approval to model the BLCF utilizing PW4062 engines with the AEDT type 747-400 equipped with PW4056 engines. The BLCF is a modified version of this aircraft.

In addition to the BLCF, the U.S. Navy's EA-18G Growler does not have an associated AEDT aircraft type. The EA-18G Growler is a carrier-based electronic warfare aircraft derived from the two-seat F/A-18F Super Hornet. Upon evaluation of the AEDT Fleet Database, there is one comparable AEDT aircraft, the F-18. The F-18 is equipped with F404-GE-400 engines.

After reviewing the engine and aircraft characteristics, ESA recommends that the F-18 be approved as an appropriate substitute for the EA-18G. Engine and aircraft characteristics for the EA-18G and F-18 are presented in **Table 2**.

Table 2
Aircraft Characteristics and FAA Noise Certification Data

Aircraft Data[1]						**Noise (EPNdB)[2]**		
Manufacturer	**Aircraft Model**	**MTOW (lbs)**	**MLW (lbs)**	**Engine Type**	**Thrust (lbs)**	**Takeoff**	**Side-Line**	**Approach**
McDonnell Douglas	F-18	51,900	NA	F404-GE-402	11,000	NA	NA	NA
Boeing	EA-18G	66,000	NA	F414-GE-400	14,000	NA	NA	NA

1. F-18 information is obtained from http://www.navy.mil/navydata/fact_display.asp?cid=1100&tid=1200&ct=1. EA-18G information is obtained from http://www.boeing.com/defense/ea-18g-growler/ and http://aviationweek.com/site-files/aviationweek.com/files/uploads/2015/04/asd_04_10_2015_growlerspec1.pdf
2. Noise data not available from https://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/, Appendix 1
Notes:
MTOW = Maximum Takeoff Weight
MLW = Maximum Landing Weight
NA = Information not available.
Thrust is based on dry thrust per engine.

Due to the limited aircraft available in AEDT, we propose to model the EA-18G utilizing F414-GE-400 Engines with the AEDT type F-18 equipped with F404-GE-402 engines, as it is the best and most appropriate comparable aircraft in the AEDT.

On behalf of our clients, we appreciate your consideration of this request to approve the aircraft substitutions. Please contact me at award@esassoc.com or (813) 207-7212 if you have any questions or need additional information.

ESA Airports

4200 West Cypress Street, Suite 450
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technical memorandum

date July 3, 2018

to Cayla Morgan, FAA

from Autumn Ward, CM

subject Proposed AEDT 2d Aircraft Type Substitutions

reference Snohomish County Airport/ Paine Field Supplemental Environmental Assessment (EA)

ESA is assisting Alaska Airlines, United Airlines, Inc., and Southwest Airlines Co. with the preparation of a Supplemental EA for Operations Specifications amendments and an amendment to a 14 CFR Part 139 Certification to allow Alaska Airlines, United Airlines, and Southwest Airlines and their partners to initiate service to Snohomish County Airport/Paine Field (PAE). The Supplemental EA is being prepared with the Aviation Environmental Design Tool (AEDT), Version 2d. Upon evaluating the aircraft fleet mix at PAE for the future years (2019 and 2024), the airport indicated that KC-46A Pegasus will be operated at PAE that does not have a direct AEDT type.

The KC-46A Pegasus is a military version of the Boeing 767 equipped with the Pratt & Whitney 4062 engines. This specific aircraft variant is not present in the AEDT 2d aircraft database. After reviewing the engine noise and airframe characteristics of aircraft present in the AEDT Fleet Database, it is recommended that the 767-300 with PW4062 engines be approved as an appropriate substitute for the KC-46A. Engine noise and airframe characteristics for the 767-300, as well as available information on the KC-46A, are presented in **Table 1**.

Table 1
Aircraft Characteristics and FAA Noise Certification Data

Aircraft Data[1]						**Noise (EPNdB)[2]**		
Manufacturer	**Aircraft Model**	**MTOW (lbs)**	**MLW (lbs)**	**Engine Type**	**Thrust (lbs)**	**Takeoff**	**Side-Line**	**Approach**
Boeing	767-300	412,000	320,000	PW4062	62,000	92.2	99.0	100.2
Boeing	KC-46A	415,000	310,000	PW4062	62,000	NA	NA	NA

1. FAA's Advisory Circular 36-1H for Boeing 767-300; The Boeing Company KC-46A Pegasus Fact Sheet; https://www.boeing.com/defense/kc-46a-pegasus-tanker/.
2. https://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/, Appendix 1
Notes:
MTOW = Maximum Takeoff Weight
MLW = Maximum Landing Weight
NA = Information not available.
Noise levels for the KC-46A are not available in FAA's Advisory Circular 36-1H.

ESA requests approval to model the KC-46A utilizing PW4062 engines with the AEDT type 767-300 equipped with PW4062 engines. The KC-46A is a modified version of this aircraft.

On behalf of our clients, we appreciate your consideration of this request to approve the aircraft substitutions. Please contact me at award@esassoc.com or (813) 207-7212 if you have any questions or need additional information.

U.S. Department of Transportation
Federal Aviation Administration

Office of Environment and Energy

800 Independence Ave., S.W.
Washington, D.C. 20591

7/11/2018

Cayla Morgan
Environmental Protection Specialist
Federal Aviation Administration
Seattle Airports District Office
2200 S. 216th St.
Des Moines, WA 98198

Dear Cayla,

The Office of Environment and Energy (AEE) has received the memos from ESA on behalf of Alaska Airlines, United Airlines and Southwest Airlines dated June 27th 2018, and July 3rd 2018 referencing the Supplemental Environmental Assessment for Operations Specifications Amendments to initiate service to Snohomish County Airport/Paine Field (PAE).

AEE has reviewed the proposals and is providing approved AEDT2d substitutions for the Boeing 747-400F, Boeing EA-18G and Boeing KC-46A aircraft in the table below.

Proposed		**FAA AEE Approved Substitution**				
Aircraft Type	**Recommended Substitution**	**AEDT EQUIP_ID**	**AEDT Airframe**	**AEDT Engine**	**AEDT ANP**	**AEDT BADA**
Boeing 747-400 LCF	Boeing 747-400 F	5260	Boeing 747-400 Series Freighter	PW4062	747400	B744
Boeing EA-18G	McDonnel Douglas F-18	3222	Boeing F/A-18 Hornet	F414-GE-400	F18EF	FGTN
Boeing KC-46A	Boeing 767-300	5285	Boeing 767-300 ER Freighter	PW4062	767300	B763

Please understand that this approval is limited to this particular Environmental Assessment for Snohomish County/Paine Field Airport and for use with AEDT 2d only. Further non-standard AEDT inputs for additional projects at this or any other site will require separate approval

Sincerely,

Rebecca Cointin
Manager
AEE-100/Noise Division

cc: Airports Contact (Tom Cuddy APP-400)