

Engineering Statement

1 Introduction

Intelsat License LLC, as debtor in possession (“Intelsat”), seeks authority in this application to modify the Intelsat 904 satellite license to provide C-band services in new coverage areas from its licensed 29.5° W.L. (330.5 °E.L) orbital location by biasing the satellite platform.¹

The characteristics of the Intelsat 904 satellite, as well as its compliance with the various provisions of Part 25 of the Federal Communications Commission’s (“FCC” or “Commission”) rules, are provided in the remainder of this Engineering Statement and the new beam gain contours are provided in the Schedule S.² In all other respects, the characteristics of Intelsat 904 are the same as those described in SAT-MOD-20190422-00031. With exception of the sections provided herein, Intelsat incorporates by reference the Engineering Statement from its 2019 modification.³

2 Satellite Overview

Intelsat 904 is capable of operating in the C-band and Ku-band frequencies listed below:

Direction	Frequency
Uplink	5850-5925 MHz
	5925-6425 MHz
	14000-14500 MHz
Downlink	3625-3700 MHz
	3700-4200 MHz
	10950-11200 MHz
	11450-11700 MHz

¹ The two Ku-band spot beams and the global C-band beam coverage is not affected by the proposed platform bias.

² Intelsat 904 will continue operating at 29.5° W.L.; the Schedule S form rounds the location to 30.0° W.L.

³ See Application of Intelsat License LLC to Modify Authorization for Intelsat 904, File No. SAT-MOD-20190422-00031 at Engineering Statement (granted Aug. 1, 2019).

The satellite will provide the following coverage:

Beam	Coverage
Ku-band Spot 1	Steerable beam can be pointed toward any location visible from 29.5° W.L.
Ku-band Spot 2	Steerable beam can be pointed toward any location visible from 29.5° W.L.
C-band West Hemi	Eastern Canada, Greenland, Eastern CONUS, Mexico, Caribbean, and South America
C-band East Hemi	Africa, Middle East, and Europe
C-band Northwest	Eastern CONUS and Eastern Canada
C-band Southwest	Southern CONUS, South America, Mexico, and the Caribbean
C-band Middle East	Western Africa, Western Europe, and Greenland
C-band Southeast	Southeast Africa
C-band Northeast	Middle East, North Africa, and Eastern Europe
C-band Combined East	Africa, Eastern Europe, and Middle East
C-band Global	Global

3 International Telecommunication Union (“ITU”) Filings

Intelsat 904 will operate under the United States’ INTELSAT6 330.5E, INTELSAT8 330.5E, INTELSAT9 330.5E and USASAT-55P ITU filings.

4 Orbital Debris Mitigation Plan

Intelsat is proactive in ensuring safe operation and disposal of this and all satellite under its control. The four elements of debris mitigation are addressed below.

4.1 Satellite Hardware Design

The satellite is designed such that no debris will be released during normal operations. Intelsat has assessed the probability of collision with meteoroids and other debris. In order to limit the effects of such unlikely collisions critical satellite components are located inside the protective body of the satellite and are properly shielded. The satellite does not use any subsystems for end-of-life disposal that are not used for normal operations.

4.2 Minimizing Accidental Explosions

Intelsat has assessed the probability of accidental explosions during and after completion of mission operations. The satellite is designed in a manner to minimize the potential for such explosions. Propellant tanks and thrusters are isolated using redundant valves and electrical power systems are shielded in accordance with standard industry practices. At the completion of the mission and upon disposal of the satellite, Intelsat will ensure the removal of all stored energy on the satellite by depleting all propellant tanks, venting all pressurized systems and by leaving the batteries in a permanent discharge state.

4.3 Safe Flight Profiles

Intelsat has assessed and limited the probability of the space station becoming a source of debris as a result of collisions with large debris or other operational space stations. Intelsat 904 is not located at the same orbital location as another satellite or at an orbital location that has an overlapping station keeping volume with another satellite. Intelsat is also not aware of any system with an overlapping station-keeping volume with Intelsat 904 that is the subject of an ITU filing and that is either in orbit or progressing towards launch.

4.4 Post Mission Disposal

At the end of the mission, Intelsat intends to dispose of the satellite by moving it to an altitude of at least 150 kilometers above the geostationary arc as previously stated. Intelsat has reserved 52.8 kilograms of propellant for this purpose.

The reserved fuel figure was determined by the satellite manufacturer and provided for in the propellant budget. This figure was calculated taking into account the expected mass of the satellite at the end of life and the required delta-velocity to achieve the desired orbit. The fuel gauging uncertainty has been taken into account in these calculations.

Certification Statement

I hereby certify that I am a technically qualified person and am familiar with Part 25 of the Commission's rules. The contents of this engineering statement were prepared by me or under my direct supervision and to the best of my knowledge are complete and accurate.

/s/ Giselle Creaser

September 17, 2020

Intelsat US LLC
Director Spectrum Policy,
Engineering

Date