NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

N 8900.350

National Policy

Effective Date:
3/7/16

Cancellation Date:
3/7/17

SUBJ: OpSpec/MSpec/LOA B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS)

1. Purpose of This Notice. This notice amends Operations Specification (OpSpec)/Management Specification (MSpec)/Letter of Authorization (LOA) B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS), and clarifies guidance for Federal Aviation Administration (FAA) inspectors to authorize and issue OpSpec/MSpec/LOA B036 to operators conducting airplane operations under Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 91 subpart K (part 91K), 121, 125 (including A125 Letter of Deviation Authority (LODA) holders), and 135. Sample templates contained in the notice appendices enable airplanes equipped with a Multiple Long-Range Navigation System (M-LRNS) to qualify for Required Navigation Performance (RNP), Advanced RNP (A-RNP) and/or RNP 2 and/or RNP 4 and/or RNP 10 for operation in oceanic and remote continental areas. This notice amends B036 templates to accommodate the following bundling options:

- A-RNP, RNP 2, RNP 4, RNP 10;
- RNP 2, RNP 4, RNP 10;
- RNP 4, RNP 10; and
- RNP 10.

2. Audience. The primary audience for this notice consists of FAA certificate-holding district offices (CHDO) and principal operations inspectors (POI) assigned to operators conducting airplane operations under parts 91, 91K, 121, 125 (including LODA 125M operators), and 135. The secondary audience includes Flight Standards Service (AFS) divisions and branches in the regions and in headquarters (HQ).

3. Where You Can Find This Notice. You can find this notice on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices. Inspectors can access this notice through the Flight Standards Information Management System (FSIMS) at http://fsims.avs.faa.gov. Operators can find this notice on the FAA's Web site at http://fsims.faa.gov. This notice is available to the public at http://www.faa.gov/regulations_policies/orders_notices.

4. Background. This change is necessary in order for U.S. policy guidance to reflect recent updates to the International Civil Aviation Organization (ICAO) Document 9613, Performance-based Navigation (PBN) Manual. (Refer to the current edition of Advisory Circular (AC) 90-105, Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System and in Oceanic and Remote Continental Airspace, Appendices E through I.) A-RNP is added as an option to the oceanic/remote continental environments for those operators who are operationally and functionally able to perform Radius to Fix (RF), parallel offset, and scalability. The bundling concept incorporated into this revision of OpSpec/MSpec/LOA B036 combines A-RNP with RNP 2, RNP 4, and RNP 10 for those who qualify with options for fewer PBN authorizations down to RNP 10 only (see Table 1, Authorized Airplane(s), Equipment). Though not currently used in the United States, Fixed Radius Transition (FRT) and Time of Arrival Control (TOAC) may be added to the overall bundle for those who qualify. Bundling improves efficiency and reduces cost to the operator and the FAA.

5. Guidance. Detailed guidance for A-RNP, RNP 2, RNP 4, and RNP 10 operations is available in AC 90-105. The Flight Technologies and Procedures Division (AFS-400) developed this notice, which contains the following:

- Sample LOA B036 template in Appendix A applies to part 91.
- Sample MSpec B036 template in Appendix B applies to part 91K.
- Sample OpSpec B036 template in Appendix C applies to part 121.
- Sample OpSpec B036 template in Appendix D applies to part 121/135.
- Sample OpSpec B036 template in Appendix E applies to part 125.
- Sample LOA B036 template in Appendix F applies to part 125 LODA holders (125M).
- Sample OpSpec B036 template in Appendix G applies to part 135.

a. International Operations. This OpSpec is an authorization for oceanic and remote continental operations and is a prerequisite for other appropriate Special Area of Operation (SAO) authorizations. Operators conducting international operations must contact their POI to obtain the appropriate OpSpec for their specific area of flight operations.

b. Usage of Global Navigation Satellite System (GNSS). Operators take note that the current editions of AC 91-70, Oceanic and Remote Continental Airspace Operations, and AC 90-105 address aircraft that use GNSS as primary navigation, including requirements for receiver autonomous integrity monitoring (RAIM) and fault detection and exclusion (FDE).

6. Action. This is a nonmandatory change to OpSpec B036. PIs should review the new templates for OpSpec/MSpec/LOA B036. Operators should review and incorporate the new guidance in AC 90-105 into their flightcrew procedures and pilot training programs. The POIs and operators should access current qualifications and determine where bundling and A-RNP may apply. Bundling will be enabled for future authorizations but remains optional for those currently qualified for B036 operations.

7. Disposition. Information in this notice will be incorporated into FAA Order 8900.1 prior to the cancellation of this notice. Direct questions concerning the information in this notice to the Performance-Based Flight Systems Branch (AFS-470) at 202-267-8806.

John Barbagallo
Deputy Director, Flight Standards Service

Appendix A. Sample LOA B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 91

Letter of Authorization

Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS)

1. Authorization. The Operator listed at the bottom of this document is authorized to conduct operations within airspace designated as Required Navigation Performance (RNP) airspace in accordance with the limitations and provisions of this letter of authorization (LOA) and is subject to the conditions that all operations conducted within the designated RNP Airspace are in accordance with 14 CFR part 91, § 91.703, and the flight rules contained in International Civil Aviation Organization (ICAO) Annex 2.

2. Authorized Airplanes. The operator is authorized to use the airplanes listed in Table 1 below for operations in designated RNP airspace when the required equipment is operational and maintained in accordance with the airplane or equipment manufacturer's recommendations.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

3. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements for remote and oceanic operations. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the operator must be operationally and functionally qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP operator must have adequate continuity for the operation.

4. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

5. Crew Training. In accordance with §§ 91.3 and 91.703(a)(1) and (2) and ICAO Annex 2 (Rules of the Air), paragraph 2.3.2 (Pre-flight action) crews are responsible for policies and procedures in areas of operations where flights are conducted.

6. Special Limitations and Provisions. The operator must conduct all operations using Multiple Long-Range Navigation Systems (M-LRNS) in accordance with the following limitations and provisions:

a. The operator must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

b. A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

c. At RNP 2 flight release, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(1) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the operator should revise the flight plan (e.g., delay the departure or plan a different route).

d. At RNP 4 flight release, at least two independent LRNSs must be installed and operational with integrity such that the navigation system does not provide misleading information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(1) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

e. At RNP 10 flight release, at least one of the navigation system configurations listed below must be installed and operational:

(1) At least two independent inertial navigation systems (INS);

(2) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(3) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(4) INS that use a mixed position solution (e.g., triple mix); or

(5) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

(6) Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

7. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

a. At flight release, one of the navigation system configurations listed in subparagraph 6c, d, or e must be installed, operational, and (as listed in paragraph 2, Table 1) approved for the specified RNP (or better).

b. The operator must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

c. The ICAO flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and operator are approved for the specified RNP (or better).

8. Responsible Person. The Responsible Person for crew operations may be either an agent for service (who must be a U.S. citizen) or a person who is a U.S. citizen or holds a U.S. pilot certificate and accepts responsibility for complying with the stated regulations by signing this document.

a. If the Responsible Person signing this LOA relinquishes responsibility, this LOA becomes invalid.

b. The name, email address, and telephone number of the Responsible Person signing this LOA are listed in Table 2 below:

Table 2 – Responsible Person

Name	Email Address	Telephone Number
[LOAD Operator Data]		

9. Deviations to RNP Requirements. The administrator may authorize an operator to deviate from RNP requirements for a specific individual flight in airspace where an RNP is specified if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

a. If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

b. The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

c. At flight release, at least one of the navigation system configurations listed in subparagraph 6c, d, or e above must be installed and operational.

Appendix B. Sample MSpec B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 91 Subpart K

a. The program manager is authorized to conduct Oceanic and Remote Continental navigation using Multiple Long-Range Navigation Systems (M-LRNS) only within the areas of en route operation where this paragraph is referenced in paragraph MB050 of these management specifications. Unless specifically authorized elsewhere in these management specifications, the program manager must not conduct Oceanic and Remote Continental navigation operations within Central East Pacific (CEP) Airspace, North Pacific (NOPAC) Airspace, North Atlantic Minimum Navigation Performance Specifications (NAT/MNPS) Airspace, or areas of magnetic unreliability (AMU). The program manager must conduct all Oceanic and Remote Continental navigation operations using M-LRNS in accordance with the provisions of this paragraph.

b. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the program manager must be qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP program manager must have adequate continuity for the operation.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

c. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

d. Special Limitations and Provisions. The program manager must conduct all operations using M-LRNS in accordance with the following limitations and provisions:

(1) The program manager must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate

the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

(2) The navigation system must be operational as required by management specifications MB037 (CEP), MB038 (NOPAC), MB039 (NAT/MNPS), or MB040 (AMU), as applicable.

(3) Except when navigation is being performed under the supervision of a check pilot properly qualified for Oceanic and Remote Continental navigation, the flightcrew must be qualified on the system being used in accordance with the program manager's approved training program. The flightcrew performing under the supervision of a check pilot must have satisfactorily completed the ground school portion of that training program.

(4) Prior to entering any airspace requiring the use of a LRNS, for airplanes approved for operations using GPS equipage and/or DME/DME automatic updating, the systems must be confirmed to be functioning normally (no fault indications); for all other airplanes the position must be accurately fixed using airways navigation facilities or ATC radar.

(5) After exiting this airspace, the airplane position must be accurately fixed and the LRNS error must be determined and logged in accordance with the program manager's approved procedures. An arrival gate position check satisfies this requirement.

(6) For airplanes approved for operations and using GPS equipage and/or DME/DME automatic position updating, no exit position fix is required unless there is an indication of LRNS malfunction.

(7) A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

(8) At RNP 2 dispatch, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(a) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the program manager should revise the flight plan (e.g., delay the departure or plan a different route).

(9) At RNP 4 dispatch, at least two independent LRNSs must be installed and operational, with integrity such that the navigation system does not provide misleading information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(a) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

(10) At RNP 10 dispatch, at least one of the navigation system configurations listed below must be installed and operational:

(a) At least two independent inertial navigation systems (INS);

(b) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(c) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(d) INS that use a mixed position solution (e.g., triple mix); or

(e) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

(11) Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

e. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

(1) At dispatch, one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed, operational and (as listed in paragraph b, Table 1) approved for the specified RNP (or better).

(2) The program manager must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

(3) The International Civil Aviation Organization (ICAO) flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and program manager are approved for the specified RNP (or better).

f. Deviations to RNP Requirements. The Administrator may authorize a program manager to deviate from the RNP requirements in paragraph d for a specific individual flight in airspace where an RNP is specified, if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

(1) If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

(2) The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

(3) At dispatch, at least one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed and operational.

Appendix C. Sample OpSpec B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 121

a. The certificate holder is authorized to conduct Oceanic and Remote Continental navigation using Multiple Long-Range Navigation Systems (M-LRNS) only within the areas of en route operation where this paragraph is referenced in paragraph B050 of these operations specifications. Unless specifically authorized elsewhere in these operations specifications, the certificate holder must not conduct Oceanic and Remote Continental navigation operations within Central East Pacific (CEP) Airspace, North Pacific (NOPAC) Airspace, North Atlantic Minimum Navigation Performance Specifications (NAT/MNPS) Airspace, or areas of magnetic unreliability (AMU). The certificate holder must conduct all Oceanic and Remote Continental navigation operations using M-LRNS in accordance with the provisions of this paragraph.

b. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements for oceanic and remote operations. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the certificate holder must be qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP certificate holder must have adequate continuity for the operation.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

c. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

d. Special Limitations and Provisions. The certificate holder must conduct all operations using M-LRNS in accordance with the following limitations and provisions:

(1) The certificate holder must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate

the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

(2) The navigation system must be operational as required by operations specifications B037 (CEP), B038 (NOPAC), B039 (NAT/MNPS), or B040 (AMU), as applicable.

(3) Except when navigation is being performed under the supervision of a check airman properly qualified for Oceanic and Remote Continental navigation, the flightcrew must be qualified on the system being used in accordance with the certificate holder's approved training program. The flightcrew performing under the supervision of a check airman must have satisfactorily completed the ground school portion of that training program.

(4) Prior to entering any airspace requiring the use of a LRNS, for airplanes approved for operations using GPS equipage and/or DME/DME automatic updating, the systems must be confirmed to be functioning normally (no fault indications); for all other airplanes the position must be accurately fixed using airways navigation facilities or ATC radar.

(5) After exiting this airspace, the airplane position must be accurately fixed and the LRNS error must be determined and logged in accordance with the certificate holder's approved procedures. An arrival gate position check satisfies this requirement.

(6) For airplanes approved for operations and using GPS equipage and/or DME/DME automatic position updating, no exit position fix is required unless there is an indication of LRNS malfunction.

(7) A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

(8) At RNP 2 dispatch, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(a) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the operator should revise the flight plan (e.g., delay the departure or plan a different route).

(9) At RNP 4 dispatch, at least two independent LRNSs must be installed and operational, with integrity such that the navigation system does not provide misleading information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(a) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

(10) At RNP 10 dispatch, at least one of the navigation system configurations listed below must be installed and operational:

(a) At least two independent inertial navigation systems (INS);

(b) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(c) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(d) INS that use a mixed position solution (e.g., triple mix); or

(e) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

(11) Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

e. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

(1) At dispatch, one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed, operational, and (as listed in paragraph b, Table 1) approved for the specified RNP (or better).

(2) The certificate holder must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

(3) The International Civil Aviation Organization (ICAO) flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and certificate holder are approved for the specified RNP (or better).

f. Deviations to RNP Requirements. The Administrator may authorize a certificate holder to deviate from RNP requirements in paragraph d for a specific individual flight in airspace where an RNP is specified, if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

(1) If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

(2) The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

(3) At dispatch, at least one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed and operational.

Appendix D. Sample OpSpec B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 121/135

a. The certificate holder is authorized to conduct Oceanic and Remote Continental navigation using Multiple Long-Range Navigation Systems (M-LRNS) only within the areas of en route operation where this paragraph is referenced in paragraph B050 of these operations specifications. Unless specifically authorized elsewhere in these operations specifications, the certificate holder must not conduct Oceanic and Remote Continental navigation operations within Central East Pacific (CEP) Airspace, North Pacific (NOPAC) Airspace, North Atlantic Minimum Navigation Performance Specifications (NAT/MNPS) Airspace, or areas of magnetic unreliability (AMU). The certificate holder must conduct all Oceanic and Remote Continental navigation operations using M-LRNS in accordance with the provisions of this paragraph.

b. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements for oceanic and remote operations. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the certificate holder must be qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP certificate holder must have adequate continuity for the operation.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

c. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

d. Special Limitations and Provisions. The certificate holder must conduct all operations using M-LRNS in accordance with the following limitations and provisions:

(1) The certificate holder must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate

the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

(2) The navigation system must be operational as required by operations specifications B037 (CEP), B038 (NOPAC), B039 (NAT/MNPS), or B040 (AMU), as applicable.

(3) Except when navigation is being performed under the supervision of a check airman properly qualified for Oceanic and Remote Continental navigation, the flightcrew must be qualified on the system being used in accordance with the certificate holder's approved training program. The flightcrew performing under the supervision of a check airman must have satisfactorily completed the ground school portion of that training program.

(4) Prior to entering any airspace requiring the use of a LRNS, for airplanes approved for operations using GPS equipage and/or DME/DME automatic updating, the systems must be confirmed to be functioning normally (no fault indications); for all other airplanes the position must be accurately fixed using airways navigation facilities or ATC radar.

(5) After exiting this airspace, the airplane position must be accurately fixed and the LRNS error must be determined and logged in accordance with the certificate holder's approved procedures. An arrival gate position check satisfies this requirement.

(6) For airplanes approved for operations and using GPS equipage and/or DME/DME automatic position updating, no exit position fix is required unless there is an indication of LRNS malfunction.

(7) A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

(8) At RNP 2 dispatch, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(a) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the operator should revise the flight plan (e.g., delay the departure or plan a different route).

(9) At RNP 4 dispatch, at least two independent LRNSs must be installed and operational, with integrity such that the navigation system does not provide misleading information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(a) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

(10) At RNP 10 dispatch, at least one of the navigation system configurations listed below must be installed and operational:

(a) At least two independent inertial navigation systems (INS);

(b) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(c) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(d) INS that use a mixed position solution (e.g., triple mix); or

(e) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

(11) Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

e. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

(1) At dispatch, one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed, operational and (as listed in paragraph b, Table 1) approved for the specified RNP (or better).

(2) The certificate holder must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

(3) The International Civil Aviation Organization (ICAO) flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and certificate holder are approved for the specified RNP (or better).

f. Deviations to RNP Requirements. The Administrator may authorize a certificate holder to deviate from RNP requirements in paragraph d for a specific individual flight in airspace where an RNP is specified, if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

(1) If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

(2) The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

(3) At dispatch, at least one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed and operational.

Appendix E. Sample OpSpec B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 125

a. The certificate holder is authorized to conduct Oceanic and Remote Continental navigation using Multiple Long-Range Navigation Systems (M-LRNS) only within the areas of en route operation where this paragraph is referenced in paragraph B050 of these operations specifications. Unless specifically authorized elsewhere in these operations specifications, the certificate holder must not conduct Oceanic and Remote Continental navigation operations within Central East Pacific (CEP) Airspace, North Pacific (NOPAC) Airspace, North Atlantic Minimum Navigation Performance Specifications (NAT/MNPS) Airspace, or areas of magnetic unreliability (AMU). The certificate holder must conduct all Oceanic and Remote Continental navigation operations using M-LRNS in accordance with the provisions of this paragraph.

b. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements for oceanic and remote operations. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the certificate holder must be qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP certificate holder must have adequate continuity for the operation.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

c. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

d. Special Limitations and Provisions. The certificate holder must conduct all operations using M-LRNS in accordance with the following limitations and provisions:

(1) The certificate holder must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate

the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

(2) The navigation system must be operational as required by operations specifications B037 (CEP), B038 (NOPAC), B039 (NAT/MNPS), or B040 (AMU), as applicable.

(3) Except when navigation is being performed under the supervision of a check airman properly qualified for Oceanic and Remote Continental navigation, the flightcrew must be qualified on the system being used in accordance with the certificate holder's flightcrew training program. The flightcrew performing under the supervision of a check airman must have satisfactorily completed the ground school portion of that training program.

(4) Prior to entering any airspace requiring the use of a LRNS, for airplanes approved for operations using GPS equipage and/or DME/DME automatic updating, the systems must be confirmed to be functioning normally (no fault indications); for all other airplanes the position must be accurately fixed using airways navigation facilities or ATC radar.

(5) After exiting this airspace, the airplane position must be accurately fixed and the LRNS error must be determined and logged in accordance with the certificate holder's approved procedures. An arrival gate position check satisfies this requirement.

(6) For airplanes approved for operations and using GPS equipage and/or DME/DME automatic position updating, no exit position fix is required unless there is an indication of LRNS malfunction.

(7) A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

(8) At RNP 2 flight release, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(a) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the operator should revise the flight plan (e.g., delay the departure or plan a different route).

(9) At RNP 4 flight release, at least two independent LRNSs must be installed and operational, with integrity such that the navigation system does not provide misleading information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(a) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

(10) At RNP 10 flight release, at least one of the navigation system configurations listed below must be installed and operational:

(a) At least two independent inertial navigation systems (INS);

(b) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(c) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(d) INS that use a mixed position solution (e.g., triple mix); or

(e) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

(11) Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. The maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

e. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

(1) At flight release, one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed, operational and (as listed in paragraph b, Table 1) approved for the specified RNP (or better).

(2) The certificate holder must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

(3) The International Civil Aviation Organization (ICAO) flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and certificate holder are approved for the specified RNP (or better).

f. Deviations to RNP Requirements. The Administrator may authorize a certificate holder to deviate from RNP requirements in paragraph d for a specific individual flight in airspace where an RNP is specified, if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

(1) If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

(2) The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

(3) At flight release, at least one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed and operational.

Appendix F. Sample LOA B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 125 (LODA A125)

Letter of Authorization

Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS)

1. The Operator/Company, authorized to conduct operations in accordance with the Letter of Deviation Authority (LODA A125), is authorized to conduct Oceanic and Remote Continental navigation using Multiple Long-Range Navigation Systems (M-LRNS) only within the areas of en route operation where this letter of authorization (LOA) is referenced in lLOA B050 of these authorizations. Unless specifically authorized elsewhere in these authorizations, the Operator/Company must not conduct Oceanic and Remote Continental navigation operations within Central East Pacific (CEP) Airspace, North Pacific (NOPAC) Airspace, North Atlantic Minimum Navigation Performance Specifications (NAT/MNPS) Airspace, or areas of magnetic unreliability (AMU). The Operator/Company must conduct all Oceanic and Remote Continental navigation operations using M-LRNS in accordance with the provisions of this LOA.

2. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements for oceanic and remote operations. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the Operator/Company must be qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP Operator/Company must have adequate continuity for the operation.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

3. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

4. Special Limitations and Provisions. The Operator/Company must conduct all operations using M-LRNS in accordance with the following limitations and provisions:

a. The Operator/Company must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

b. The navigation system must be operational as required by letters of authorization B037 (CEP), B038 (NOPAC), B039 (NAT/MNPS), or B040 (AMU), as applicable.

c. Except when navigation is being performed under the supervision of a check airman properly qualified for Oceanic and Remote Continental navigation, the flightcrew must be qualified on the system being used in accordance with the Operator's/Company's flightcrew training program. The flightcrew performing under the supervision of a check airman must have satisfactorily completed the ground school portion of that training program.

d. Prior to entering any airspace requiring the use of a LRNS, for airplanes approved for operations using GPS equipage and/or DME/DME automatic updating, the systems must be confirmed to be functioning normally (no fault indications); for all other airplanes, the position must be accurately fixed using airways navigation facilities or ATC radar.

e. After exiting this airspace, the airplane position must be accurately fixed and the long-range navigation system error must be determined and logged in accordance with the Operator's/Company's approved procedures. An arrival gate position check satisfies this requirement.

f. For airplanes approved for operations and using GPS equipage and/or DME/DME automatic position updating, no exit position fix is required unless there is an indication of LRNS malfunction.

g. A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

h. At RNP 2 flight release, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(1) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the operator should revise the flight plan (e.g., delay the departure or plan a different route).

i. At RNP 4 flight release, at least two independent LRNSs must be installed and operational, with integrity such that the navigation system does not provide misleading

information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(1) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

j. At RNP 10 flight release, at least one of the navigation system configurations listed below must be installed and operational:

(1) At least two independent inertial navigation systems (INS);

(2) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(3) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(4) INS that use a mixed position solution (e.g., triple mix); or

(5) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

k. Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

5. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

a. At flight release, one of the navigation system configurations listed in subparagraph 4h, i, or j must be installed, operational, and (as listed in paragraph 2, Table 1) approved for the specified RNP (or better).

b. The Operator/Company must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

c. The International Civil Aviation Organization (ICAO) flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and Operator/Company are approved for the specified RNP (or better).

6. Deviations to RNP Requirements. The Administrator may authorize an Operator/Company to deviate from RNP requirements in paragraph 5 for a specific individual flight in airspace where an RNP is specified, if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

a. If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

b. The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

c. At flight release, at least one of the navigation system configurations listed in subparagraph 4h, i, or j above must be installed and operational.

Appendix G. Sample OpSpec B036, Oceanic and Remote Continental Navigation Using Multiple Long-Range Navigation Systems (M-LRNS): 14 CFR Part 135

a. The certificate holder is authorized to conduct Oceanic and Remote Continental navigation using Multiple Long-Range Navigation Systems (M-LRNS) only within the areas of en route operation where this paragraph is referenced in paragraph B050 of these operations specifications. Unless specifically authorized elsewhere in these operations specifications, the certificate holder must not conduct Oceanic and Remote Continental navigation operations within Central East Pacific (CEP) Airspace, North Pacific (NOPAC) Airspace, North Atlantic Minimum Navigation Performance Specifications (NAT/MNPS) Airspace, or areas of magnetic unreliability (AMU). The certificate holder must conduct all Oceanic and Remote Continental navigation operations using M-LRNS in accordance with the provisions of this paragraph.

b. Bundling Navigation Specifications. In Table 1, under the Navigation Specification(s) column, bundling of Advanced Required Navigation Performance (A-RNP), RNP 2, RNP 4, and RNP 10 may be authorized for equipment that meets the necessary performance requirements for oceanic and remote operations. Lesser bundles are also available: RNP 2, RNP 4, and RNP 10 or RNP 4 and RNP 10 or RNP 10 only. As a minimum for A-RNP, the certificate holder must be qualified for the following advanced capabilities: scalability, Radius to Fix (RF), and parallel offset. Additionally, the A-RNP certificate holder must have adequate continuity for the operation.

Table 1 – Authorized Airplane(s), Equipment

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/Ver#				
B-777-300 ER B-787-800 Etc.				A-RNP/RNP 2/ RNP 4/RNP 10 RNP 2/RNP 4/ RNP 10 RNP 4/RNP 10 RNP 10	FRT TOAC FRT/TOAC	No Lateral Offset	

c. Additional Capabilities. Fixed Radius Transition (FRT) and/or Time of Arrival Control (TOAC) may be selected in Table 1 under Additional Capabilities for those who qualify.

d. Special Limitations and Provisions. The certificate holder must conduct all operations using M-LRNS in accordance with the following limitations and provisions:

(1) The certificate holder must conduct all Oceanic and Remote Continental navigation operations so the airplane is continuously navigated to the degree of accuracy or RNP required for air traffic control (ATC). For areas where these accuracy and navigation performance standards have not been formally established, the LRNS must be used to continuously navigate

the airplane so that the cross-track and/or the along-track errors will not exceed 25 nautical miles at any point along the flight plan route specified in the ATC clearance.

(2) The navigation system must be operational as required by operations specifications B037 (CEP), B038 (NOPAC), B039 (NAT/MNPS), or B040 (AMU), as applicable.

(3) Except when navigation is being performed under the supervision of a check airman properly qualified for Oceanic and Remote Continental navigation, the flightcrew must be qualified on the system being used in accordance with the certificate holder's approved training program. The flightcrew performing under the supervision of a check airman must have satisfactorily completed the ground school portion of that training program.

(4) Prior to entering any airspace requiring the use of a LRNS, for airplanes approved for operations using GPS equipage and/or DME/DME automatic updating, the systems must be confirmed to be functioning normally (no fault indications); for all other airplanes the position must be accurately fixed using airways navigation facilities or ATC radar.

(5) After exiting this airspace, the airplane position must be accurately fixed and the LRNS error must be determined and logged in accordance with the certificate holder's approved procedures. An arrival gate position check satisfies this requirement.

(6) For airplanes approved for operations and using GPS equipage and/or DME/DME automatic position updating, no exit position fix is required unless there is an indication of LRNS malfunction.

(7) A LRNS fix may be substituted for a required en route ground facility when that facility is temporarily out of service, provided the approved navigation system has sufficient capability to navigate the airplane to the degree of accuracy or RNP required for ATC over that portion of the flight.

(8) At RNP 2 dispatch, at least two independent approved Global Navigation Satellite System (GNSS) navigation systems must be installed and operational; acceptable for primary means of Oceanic and Remote Continental navigation.

(a) In the event of a predicted, continuous loss of appropriate level of fault detection of more than 5 minutes for any part of the RNP 2 operation, the operator should revise the flight plan (e.g., delay the departure or plan a different route).

(9) At RNP 4 dispatch, at least two independent LRNSs must be installed and operational, with integrity such that the navigation system does not provide misleading information. The LRNSs must be fitted to the airplane and form part of the basis upon which RNP 4 operational approval is granted. GNSS can be used as a standalone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system.

(a) Twenty-five minutes is the maximum allowable time for which fault detection and exclusion (FDE) capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 4 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

(10) At RNP 10 dispatch, at least one of the navigation system configurations listed below must be installed and operational:

(a) At least two independent inertial navigation systems (INS);

(b) At least two flight management systems (FMS)/navigation sensor combinations (or equivalent);

(c) At least two independent approved GPS navigation systems acceptable for primary means of Oceanic and Remote Continental navigation in oceanic and remote areas;

(d) INS that use a mixed position solution (e.g., triple mix); or

(e) At least two approved independent LRNS from the list below:

- INS.
- FMS/navigation sensor combination (or equivalent).
- GPS navigation system approved for Oceanic and Remote Continental navigation in oceanic and remote areas.

(11) Thirty-four minutes is the maximum allowable time for which FDE capability is projected to be unavailable on any one event. This maximum outage time must be included as a condition of the RNP 10 operational approval. If predictions indicate that the maximum allowable FDE outage will be exceeded, the operation must be rescheduled to a time when FDE is available.

e. Operation on Routes or in Areas where an RNP is Specified. Operations in areas or on routes where an RNP is specified must be conducted in accordance with the following limitations or provisions:

(1) At dispatch, one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed, operational and (as listed in paragraph b, Table 1) approved for the specified RNP (or better).

(2) The certificate holder must ensure that the airplane navigation system will provide the specified RNP for the planned flight time in the airspace and, if applicable, that the airplane will be operated in the RNP area of operation established using the RNP time limit listed in Table 1.

(3) The International Civil Aviation Organization (ICAO) flight plan filed with the Air Traffic Service Provider (ATSP) must show that the airplane and certificate holder are approved for the specified RNP (or better).

f. Deviations to RNP Requirements. The Administrator may authorize a certificate holder to deviate from RNP requirements in paragraph d for a specific individual flight in airspace where an RNP is specified, if the ATSP determined that the airplane will not interfere with, or impose a burden on other operators. Operations conducted under such authority will be conducted in accordance with the following limitations and provisions:

(1) If fuel planning is predicated on en route climb to flight levels where RNP is normally required, an appropriate request must be coordinated in advance of the flight with the ATSP.

(2) The appropriate information blocks in the ICAO flight plan filed with the ATSP must show that the airplane is **not** approved for the specified RNP.

(3) At dispatch, at least one of the navigation system configurations listed in subparagraph d(8), (9), or (10) above must be installed and operational.