

VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 58 MANAGEMENT OF AVIATION FATIGUE

Section 1 Review and Acceptance of Fatigue Risk Management Plans (FRMP)

3-4564 GENERAL. On August 1, 2010, the President signed Public Law (PL) 111-216, Airline Safety and Federal Aviation Administration Extension Act of 2010 (the Act), which focuses on improving aviation safety. Section 212(b) of the Act requires each air carrier conducting operations under Title 14 of the Code of Federal Regulations (14 CFR) part 121 to develop, implement, and maintain a Fatigue Risk Management Plan (FRMP). An FRMP is an air carrier's management plan outlining policies and procedures for reducing the potential effects of day-to-day flightcrew member fatigue and improving flightcrew member alertness. The FRMP should be tailored to the air carrier's specific kind and type of operations. For the purpose of this section, the term "operations" means the kind of operations (e.g., domestic, flag, and supplemental) and the type of operations (e.g., multiple segments, continuous duty overnights, night vs. day operations, cargo vs. passenger operations, short-haul vs. long-haul, etc.).

3-4565 STATUTORY REQUIREMENT. PL 111-216, § 212(b) requires each air carrier conducting operations under part 121 to submit its FRMP to the Federal Aviation Administration (FAA) for review and acceptance. Each air carrier must update its FRMP at least once every 24 calendar-months and submit it to the FAA for review and acceptance. The FAA will issue operations specification (OpSpec) A317, Acceptance of a Fatigue Risk Management Plan (FRMP), to indicate acceptance of the air carrier's FRMP.

3-4566 SUBMITTAL PROCESS. Each part 121 air carrier must develop its FRMP in a manner acceptable to the FAA. Following initial acceptance, each part 121 air carrier must submit an update to its FRMP to the FAA every 24 calendar-months. The air carrier will electronically submit the FRMP, along with a completed FRMP Checklist (see Figure 3-170), to the Air Transportation Division (AFS-200) via email at 9-AFS-200-FRMP-FRMS@faa.gov. The air carrier will also provide its principal operations inspector (POI) with a copy of the FRMP. AFS-200 will acknowledge receipt of the FRMP to the sender via email and copy the respective POI and regional Flight Standards division (RFSD).

3-4567 REVIEW PROCESS. AFS-200 will review the air carrier's FRMP to ensure the plan addresses each required element. The air carrier may elect to incorporate more information in its FRMP than currently outlined in the FRMP elements. However, this information may not conflict with the required FRMP elements.

A. Developing and Submitting an FRMP. The air carrier should develop an FRMP so it is easily understood, relevant to its operations, and easily updated. The air carrier should submit its FRMP with a completed FRMP Checklist (see Figure 3-170), which identifies the location of the applicable policies and procedures within the applicant's FRMP.

B. FAA Review of an FRMP. AFS-200 personnel will review the FRMP in two steps: preliminary review and in-depth review.

1) Preliminary Review. Upon receipt of the proposed FRMP, AFS-200 personnel will perform a preliminary review to ensure each required component has been addressed. If AFS-200 determines that any of the FRMP components are missing, AFS-200 will return the FRMP to the air carrier within 10 business days from receipt, along with a letter outlining which components were not addressed. If an FRMP is returned to the air carrier, the FAA will terminate the review process until a new FRMP is submitted.

2) In-Depth Review. Once AFS-200 determines that each required component has been addressed in the FRMP, AFS-200 will perform a detailed analysis of the FRMP to determine if the content is sufficient and applicable to the air carrier's operations. If AFS-200 determines the air carrier's FRMP is unacceptable, AFS-200 will return the FRMP to the air carrier with suggested modifications to make the FRMP acceptable. If an FRMP is returned to the air carrier, the FAA will terminate the review process until a new FRMP is submitted. Once AFS-200 determines that the FRMP is acceptable, the acceptance process commences.

3-4568 ACCEPTANCE PROCESS.

A. Original Acceptance of FRMP. Once AFS-200 has determined the FRMP is acceptable, AFS-200 will send a memo to the POI, through the respective RFS, authorizing the POI to issue OpSpec A317 to the air carrier. The memo will include any nonstandard text to be included in the OpSpec, as appropriate. The POI is responsible for issuing OpSpec A317 upon receiving authorization from AFS-200. The POI must incorporate any nonstandard text into the OpSpec as specified in the authorization memo. The maximum duration of OpSpec A317 is 24 calendar-months from the date of issuance and will be reflected on the air carrier's OpSpec A317.

B. FRMP Updates. PL 111-216 requires each part 121 air carrier to submit an updated FRMP to AFS-200 for review and acceptance every 24 calendar-months. Additionally, as the air carrier's operations change, the air carrier's FRMP must be amended to include the appropriate fatigue mitigation strategies necessary to reduce the effects of fatigue and improve flightcrew members' alertness in that operation.

C. Amendment of an Accepted FRMP. The air carrier may amend, or the FAA may require an amendment to, its FRMP. When the FAA requires an amendment to an air carrier's FRMP, the FAA will advise the air carrier of the recommended modification necessary. Regardless of whether the amendment is driven by the air carrier or the FAA, the air carrier must submit their amended FRMP to AFS-200 for review and acceptance.

D. Reissuance of OpSpec A317. Each time an air carrier's FRMP is reviewed and accepted by AFS-200, the FAA will reissue OpSpec A317 to include the changes and a new expiration date of 24 calendar-months from the date of issuance.

3-4569 DIFFERENCES BETWEEN AN FRMP AND A FATIGUE RISK

MANAGEMENT SYSTEM (FRMS). Distinct differences exist between an FRMP and FRMS. This guidance specifically applies to procedures for reviewing and accepting an FRMP. While the FRMP provides a basic foundation for the development of an FRMS, the contents of an FRMP do not meet all the requirements for an FRMS. Unlike an FRMP, an FRMS is an optional

fatigue mitigation tool that minimizes the acute and chronic sources of fatigue and the resultant effects of fatigue. An FRMS is a data-driven and scientifically based process that allows for continuous monitoring and management of safety risks associated with fatigue-related error (see the current edition of Advisory Circular (AC) 120-103, Fatigue Risk Management Systems for Aviation Safety).

3-4570 FRMP STRUCTURE. An FRMP framework is composed of individual components. The components interact to achieve the objective of the FRMP. Each component may have multiple elements. The interaction of the individual elements provides a method to evaluate the effectiveness of the overall plan.

3-4571 FRMP COMPONENTS. The components of an FRMP provide the organization with the appropriate authority, policies and procedures, controls, reporting vehicles, education resources, monitoring, and performance evaluation tools necessary for the FRMP to be effective. The following components must be addressed in each FRMP by the respective part 121 air carrier:

- Senior level management commitment to reducing fatigue and improving flightcrew alertness.
- FRMP scope and fatigue management policies and procedures.
- Current flight time and duty period limitations.
- Rest scheme consistent with limitations.
- Fatigue reporting policy and system.
- Fatigue education and awareness training program.
- Fatigue incident reporting process.
- Fatigue monitoring system for monitoring flightcrew fatigue.
- FRMP evaluation process.

A. Senior Level Management Commitment. A vital component of any FRMP is a written commitment from senior level management to manage and mitigate fatigue during day-to-day operations. This written commitment facilitates corporate buy-in among all employees directly responsible for safety of flight issues including flightcrew members, dispatchers, individuals involved in the scheduling of flightcrew members, individuals involved in operational control, and any employee providing management oversight of those areas. Employees are more likely to report fatigue-related issues, knowing that senior level management is an advocate for fatigue mitigation.

B. FRMP Scope and Policies and Procedures. The FRMP should define the scope and objectives of the plan and include policies and procedures to implement it. A policy is based on a proactive objective, while a procedure is the method by which the objective will be met using the resources available to the air carrier.

C. Flight Time, Duty Limitations, and Rest Schemes. The air carrier must establish flight time, duty limitations, and a rest scheme at least as restrictive as the requirements of the regulations. If fatigue reporting or monitoring yield data that do not support the limitations or the rest scheme, the FRMP polices and procedures should be amended to include new fatigue

mitigations, which may result in changes to the air carrier's flight and duty limitations and/or rest scheme.

D. Fatigue Reporting Policy and System. A fatigue reporting system provides the means to subjectively report fatigue-related occurrences. Fatigue reporting supports the evaluation of the effectiveness of the FRMP. To be effective, the fatigue reporting policy must encourage employees to report fatigue-related occurrences without fear of reprisal. The air carrier's fatigue reporting system should encourage voluntary disclosure, which has proven to be an excellent vehicle for conveying safety information to those individuals who have the authority to change policy. Information collected from fatigue reports should serve as the trigger to evaluate the overall effectiveness of the FRMP and drive changes to the policies and procedures and associated education and awareness training program. An effective fatigue reporting system also contributes to an air carrier's safety culture.

E. Fatigue Education and Awareness Training Program. The training program should provide employees with information on the effects of fatigue on the safety of flight, causes of fatigue, and countermeasures to prevent or mitigate fatigue. The training program should also cover the FRMP policies and procedures. As data are collected through the fatigue reporting and monitoring processes, the elements of the education and awareness program may serve as useful tools to amend policies and procedures. The current editions of AC 120-100, Basics of Aviation Fatigue, and AC 120-103 provide background material to develop a training program. The training program must be accomplished annually by each flightcrew member, and may be incorporated into the air carrier's recurrent training program.

F. Fatigue Incident Reporting Process. The air carrier's fatigue incident reporting process should clearly state how the air carrier will collect and respond to the data received from these reports. The report should contain sufficient details to determine the root cause of a fatigue occurrence. The reporting system is vital in evaluating the overall effectiveness of the FRMP; driving changes to existing FRMP policies and procedures; effecting changes to existing flight, duty, and rest schemes; and potentially driving changes to the fatigue education and awareness training program. Other data sources that may be considered for documenting fatigue occurrences include procedural errors, flightcrew member deviations, flight exceedances, the Aviation Safety Action Program (ASAP), and flight operations quality assurance (FOQA) reports.

G. Fatigue Monitoring System. The FRMP should outline a system for monitoring flightcrew member fatigue in day-to-day operations. The FRMP should contain operational procedures to follow when one identifies or suspects fatigue risk in oneself or others. The FRMP should define how an event is evaluated for potential fatigue involvement as well as define the methodology used for conducting a detailed Root Cause Analysis (RCA) of the event. The FRMP should outline a process to capture all relevant information, such as the schedule leading up to the fatigue event, the actions of the employee to obtain rest, subjective and objective evidence of fatigue, environmental conditions that may have contributed to fatigue, specific actions related to the incident, and what, if any, communications occurred prior to and during the event.

H. FRMP Evaluation Process. The FRMP must outline a systematic process for evaluating the effectiveness of the organization's FRMP. The FRMP must define a method to continually assess the effectiveness of the FRMP, including the effectiveness of the FRMP to improve alertness and to mitigate performance errors. The FRMP must have a process to amend the air carrier's FRMP when it is determined that a policy or procedure is no longer effective in managing fatigue.

3-4572 FRMP ELEMENTS. The FRMP policies and procedures should focus on the air carrier's specific kind of operations (e.g., domestic, flag, and supplemental) and the type of operations (e.g., continuous duty overnights, night versus day operations, cargo versus passenger operations, short-haul versus long-haul, etc.). The following are the individual elements of each FRMP component.

A. Senior Level Management Commitment.

- 1) Incorporate a letter from senior level management acknowledging their commitment to managing and mitigating fatigue and improving flightcrew alertness.
- 2) Establish and incorporate the air carrier's concept of a corporate "just culture" or "safety culture."
- 3) Establish and incorporate an open communication policy for reporting fatigue-related issues.
- 4) Establish and incorporate a fatigue reporting system.
- 5) Define how to evaluate an event for potential fatigue involvement and an overview of how to conduct a detailed RCA.
- 6) Provide for protection of privacy and methods to protect the employee from adverse actions that would discourage fatigue reporting.

B. FRMP Policies and Procedures.

- 1) Clearly describe each element of the FRMP.
- 2) Define the scope and objectives of the air carrier's FRMP.
- 3) Identify the kind of operations and the type of operations conducted by the air carrier.
- 4) Incorporate the air carrier's policies and procedures to mitigate and manage the effects of fatigue and improve flightcrew alertness.
- 5) Define safety objectives and expectations of the air carrier's FRMP.

C. Current Flight Time and Duty Period Limitations.

- 1) Incorporate the flight time and duty limits used by the air carrier based upon the kind of operations and type of operations.
- 2) The limitations may be those contained in the regulations or the limitations in a collective bargaining agreement (CBA).

D. Develop a Rest Scheme Consistent with such Limitations that Enables Fatigue Mitigation.

- 1) Develop and incorporate a rest scheme to improve pilot alertness consistent with the type and kinds of operations conducted by the air carrier.
- 2) Include rest periods of adequate duration to mitigate the effects of fatigue due to scheduled vs. unscheduled operations, domestic and international operations, day vs. night operations, and operations through multiple time zones.
- 3) Develop and incorporate a rest scheme for those pilots assigned or scheduled for reserve assignments.
- 4) For those air carriers that conduct operations with augmented flightcrew, develop a rest scheme to mitigate fatigue and improve pilot alertness.

E. Fatigue Reporting Policy and System.

- 1) A fatigue reporting system permits crewmembers and other employees to report subjective fatigue and request relief from duties because of fatigue, as needed.
- 2) Develop and implement a fatigue reporting system that encourages the reporting of fatigue-related events as part of the overall FRMP.
- 3) Fatigue reports contain valuable data, especially when coupled with objective data about conditions which may contribute to fatigue, such as the work schedule prior to the report. Fatigue reports should be data sources for use by the air carrier to develop new and amended fatigue mitigation strategies.

F. Fatigue Education and Awareness Training Program.

- 1) The training program should contain:
 - a) Review of FAA flight, duty, and rest regulatory requirements.
 - b) Content of the FRMP, including policies and procedures, and the responsibilities of management and employees to mitigate or manage the effects of fatigue and improve pilot flight deck alertness.
 - c) Basics of fatigue, including sleep fundamentals and circadian rhythms.

- d) Causes and awareness of fatigue.
 - e) Effects of fatigue on pilot performance.
 - f) Fatigue countermeasures, prevention, and mitigation.
 - g) Influence of lifestyle, including nutrition, exercise, and family life on fatigue.
 - h) Familiarity with sleep disorders.
 - i) Effects of fatigue as a result of commuting.
 - j) Pilot responsibility for ensuring adequate rest and fitness for duty.
 - k) Effects of operating through multiple time zones.
 - l) Operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others.
 - m) Lessons learned regarding the effects of fatigue and mitigation initiatives relative to the air carrier's operation.
- 2) The training program should include a method to continually assess the effectiveness of the program.

G. Fatigue Incident Reporting Process to Mitigate Performance Errors.

- 1) Develop and implement a system for pilots to report performance errors attributable to fatigue, similar to crew reports that can serve as a mechanism for obtaining all relevant data regarding fatigue contributions to an incident.
- 2) Develop procedures to review and respond to reports of events that may be attributable wholly or in part to fatigue. These reports can also be data sources for use by the air carrier to develop new and amended fatigue mitigation strategies.
- 3) Other sources of data on the effects of fatigue include reports of procedural errors, pilot deviations (PD), flight exceedances, ASAP, or Aviation Safety Reporting System (ASRS) reports and FOQA data. These data sources may provide objective documentation of fatigue.

H. Fatigue Monitoring System.

- 1) Develop a process to capture fatigue-related information in event reports, such as the work schedule prior to the incident, the actions of the employee to obtain rest, subjective and objective evidence of fatigue, environmental conditions that may have exaggerated or contributed to fatigue, relevant health or medical conditions, specific actions related to the event, and communications prior to and during the event.

2) The policy must protect privacy and protect the employee from adverse actions that would discourage reports of fatigue. The air carrier will develop and implement a process for reviewing reports and the actions taken to reduce flightcrew fatigue exposure.

3) The policy should define how an event is evaluated for potential fatigue involvement as well as how to conduct a detailed RCA.

4) Incorporate operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others.

I. FRMP Evaluation Process.

1) Develop and implement a systematic process for evaluating the effectiveness of the air carrier's FRMP.

2) Develop and implement a method to continually assess the effectiveness of the FRMP, including the effectiveness of the FRMP to improve alertness and to mitigate performance errors.

3) Develop and implement a process to amend the FRMP, as appropriate, when it is determined that the FRMP policies and procedures are no longer effective in managing fatigue events.

3-4573 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- AC 120-59, Air Carrier Internal Evaluation Programs.
- AC 120-66, Aviation Safety Action Program (ASAP).
- AC 120-82, Flight Operational Quality Assurance.
- AC 120-92, Safety Management Systems for Aviation Service Providers.
- AC 120-100, Basics of Aviation Fatigue.
- AC 120-103, Fatigue Risk Management Systems for Aviation Safety.
- Safety Alert for Operators (SAFO) 09014, Concepts for Fatigue Countermeasures in Part 121 and 135 Short-Haul Operations.
- Information for Operators (InFO) 10017, Fatigue Risk Management Plans (FRMP) for Part 121 Air Carriers—Part Two.
- InFO 10017SUP, Fatigue Risk Management Plans (FRMP) for Part 121 Air Carriers—Part Two.
- Figure 3-170, Fatigue Risk Management Plan Checklist.

B. Forms. None.

C. Job Aids. Figure 3-171, Fatigue Risk Management Plan Review and Acceptance Job Aid.

Figure 3-170. Fatigue Risk Management Plan Checklist

Air Carrier:		Date:
Air Carrier Certificate Number:		
	ELEMENT AND TASK	REFERENCED IN FATIGUE RISK MANAGEMENT PLAN (FRMP)
A.	Senior Level Management Commitment to Reducing Fatigue and Improving Flightcrew Alertness.	
	i. Does the FRMP have a letter from senior level management describing their acknowledgement and commitment to managing and mitigating fatigue and improving flightcrew alertness?	
	ii. Does the corporate policy define how an event is evaluated for potential fatigue involvement as well as define an overview of the methodology for conducting a detailed Root Cause Analysis (RCA)?	
	iii. Does the FRMP define “Just Culture” or “Safety Culture”?	
	iv. Does the FRMP have an open communications policy for reporting fatigue-related issues?	
	v. Does the FRMP have a fatigue reporting system?	
B.	FRMP Scope and the Organization’s Fatigue Management Policy and Procedures.	
	i. Are the scope and objectives of the organization’s FRMP clearly defined?	
	ii. Are the organization’s policies and procedures adequate to mitigate and manage the effects of fatigue and improve flightcrew alertness?	
	iii. Is each element of the FRMP clearly defined?	
	iv. Are the organization’s FRMP safety objectives and expectations clearly defined?	
C.	Flight Time and Duty Period Limitations.	
	i. Does the FRMP contain the current flight time and duty limits that will be used by the organization based upon their kind of operations? These limitations can be either the CFR limitations or the hours of service limitations observed in the pilot’s collective bargaining agreement (CBA).	
D.	Rest Scheme Consistent with such Limitations that Enable Fatigue Mitigation.	
	i. Does the FRMP incorporate the organization’s rest scheme consistent with the kinds of operations and the type of operations conducted by the air carrier?	

Figure 3-170. Fatigue Risk Management Plan Checklist (Continued)

	ii. Does the rest scheme consider the length of rest periods required to mitigate the effects of fatigue for scheduled vs. unscheduled operations, domestic and international operations, day vs. night operations, and operations through multiple time zones, etc.?	
	iii. Is there a rest scheme for those flightcrew members assigned or scheduled for reserve assignments?	
	iv. If applicable, is there a rest scheme for augmented flightcrew operations to mitigate fatigue and improve flightcrew member alertness?	
E.	Fatigue Reporting Policy.	
	i. Does the FRMP have a fatigue reporting system that encourages the reporting of fatigue related events as part of the overall FRMP?	
	ii. Does the fatigue reporting system permit crewmembers and other employees to report subjective fatigue and, from time to time, request relief from duties because of chronic fatigue?	
	iii. Are there provisions in the FRMP for these reports being used as data sources by the organization in developing new and amended fatigue mitigation strategies?	
F.	Fatigue Education and Awareness Training Program.	
	i. The education and awareness training program should be a comprehensive educational program essential for providing the foundation in the management and mitigation of fatigue.	
	ii. The frequency of the Fatigue Education and Awareness Training Program is 12 calendar-months.	
	iii. A review of Federal Aviation Administration (FAA) flight, duty, and rest regulatory requirements.	
	iv. Content of the FRMP program, including fatigue-related policies and procedures, and the responsibilities of management and employees to mitigate or manage the effects of fatigue and improve flightcrew member flight deck alertness.	
	v. The basics of fatigue, including sleep fundamentals and circadian rhythms.	
	vi. The causes and awareness of fatigue.	
	vii. The effects of fatigue relative to flightcrew member performance.	
	viii. Fatigue countermeasures, prevention, and mitigation.	
	ix. The influence of lifestyle, including nutrition, exercise, and family life on fatigue.	
	x. Familiarity with sleep disorders.	
	xi. The effects of fatigue as a result of commuting.	

Figure 3-170. Fatigue Risk Management Plan Checklist (Continued)

	xii. Flightcrew member responsibility for ensuring adequate rest and fitness for duty.	
	xiii. The effects of operating through multiple time zones.	
	xiv. Operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others.	
	xv. Incorporate lessons learned regarding the effects of fatigue and mitigation initiatives relative to the air carrier's operations.	
	xvi. Use a methodology that continually assesses the effectiveness of the training program.	
G.	Fatigue Incident Reporting Process.	
	i. Does the FRMP have detailed procedures for reviewing and acting upon reports of events that may be attributable wholly or in part to fatigue which are similar to crew reports, and can serve as a mechanism for obtaining all relevant data regarding fatigue contributions to the incident?	
	ii. Does the FRMP consider other data sources such as procedural errors, flightcrew member deviations, flight exceedances, Aviation Safety Action Program (ASAP), or Aviation Safety Reporting System (ASRS) reports and Flight Operations Quality Assurance (FOQA) data helpful to the air carrier to objectively document fatigue?	
H.	System for Monitoring Flightcrew Fatigue.	
	i. Does the FRMP have a process to capture all relevant information, such as the schedule leading up to the fatigue event, the actions of the employee to obtain rest, subjective and objective evidence of fatigue, environmental conditions that may have contributed to fatigue, relevant health or medical conditions, specific actions related to the incident, and communications prior to and during the event?	
	ii. Does the FRMP have a corporate policy for the protection of privacy and methods to protect the employee from adverse actions that would discourage reports of fatigue?	
	iii. Does the FRMP define how an event is evaluated for potential fatigue involvement as well as defining the methodology used for conducting a detailed RCA?	
	iv. Does the FRMP contain operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others?	
I.	The Organization's FRMP Evaluation Program.	
	i. Does the FRMP have a systematic process for evaluating the effectiveness of the organization's FRMP?	

Figure 3-170. Fatigue Risk Management Plan Checklist (Continued)

	ii. Does the FRMP define use of a methodology that continually assesses the effectiveness of the FRMP, including the effectiveness of the FRMP to improve alertness and to mitigate performance errors?	
	iii. Does the FRMP have a process for determining the need for amending the FRMP, as appropriate, when it is determined that the FRMP is a policy or procedure that is no longer effective in managing a fatigue event?	

Figure 3-171. Fatigue Risk Management Plan Review and Acceptance Job Aid

Air Carrier:		Date:		
Certificate No.				
	Element and Task	Yes	No	Referenced in Fatigue Risk Management Plan (FRMP)
A.	Senior Level Management Commitment to Reducing Fatigue and Improving Flightcrew Alertness.			
	i. Does the FRMP have a letter from senior level management describing their acknowledgement and commitment to managing and mitigating fatigue and improving flightcrew alertness?			
	ii. Does the corporate policy define how an event is evaluated for potential fatigue involvement as well as define an overview of the methodology for conducting a detailed Root Cause Analysis (RCA)?			
	iii. Does the FRMP define “Just Culture” or “Safety Culture?”			
	iv. Does the FRMP have an open communications policy for reporting fatigue-related issues?			
	v. Does the FRMP have a fatigue reporting system?			
B.	FRMP Scope and the Organization’s Fatigue Management Policy and Procedures.			
	i. Are the scope and objectives of the organization’s FRMP clearly defined?			
	ii. Are the organization’s policies and procedures adequate to mitigate and manage the effects of fatigue and improve flightcrew alertness?			
	iii. Is each element of the FRMP clearly defined?			
	iv. Are the organization’s FRMP safety objectives and expectations clearly defined?			
C.	Flight Time and Duty Period Limitations.			
	i. Does the FRMP contain the current flight time and duty limits that will be used by the organization based upon their kind of operations? These limitations can be either the CFR limitations or the hours of service limitations observed in the pilot’s collective bargaining agreement (CBA).			
D.	Rest Scheme.			
	i. Does the FRMP incorporate the organization’s rest scheme consistent with the kinds of operations and the type of operations conducted by the air carrier?			
	ii. Does the rest scheme consider the length of rest periods required to mitigate the effects of fatigue for scheduled vs. unscheduled operations, domestic and international operations, day vs. night operations, operations through multiple time zones, etc.?			
	iii. Is there a rest scheme for those flightcrew members assigned or scheduled for reserve assignments?			

**Figure 3-171. Fatigue Risk Management Plan Review and Acceptance Job Aid
(Continued)**

	iv. If applicable, is there a rest scheme for augmented flightcrew operations to mitigate fatigue and improve flightcrew member alertness?			
E.	Fatigue Reporting Policy.			
	i. Does the FRMP have a fatigue reporting policy that encourages the reporting of fatigue-related events as part of the overall FRMP?			
	ii. Does the fatigue reporting policy permit crewmembers and other employees to report subjective fatigue and, from time to time, request relief from duties because of chronic fatigue?			
	iii. Are there provisions in the FRMP for these reports being used as data sources by the organization in developing new and amended fatigue mitigation strategies?			
F.	Fatigue Education and Awareness Training Program.			
	i. The frequency of the Fatigue Education and Awareness Training Program is every 12 calendar-months. Does the Fatigue Education and Awareness Training Program require recurrency every 12 calendar-months?			
	ii. A review of Federal Aviation Administration (FAA) flight, duty, and rest regulatory requirements.			
	iii. Awareness of the FRMP program itself, including fatigue-related policies and procedures, and the responsibilities of management and employees to mitigate or manage the effects of fatigue and improve flightcrew member flight deck alertness.			
	iv. The basics of fatigue, including sleep fundamentals and circadian rhythms.			
	v. The causes and awareness of fatigue.			
	vi. The effects of fatigue relative to flightcrew member performance.			
	vii. Fatigue countermeasures, prevention, and mitigation.			
	viii. The influence of lifestyle, including nutrition, exercise, and family life on fatigue.			
	ix. Familiarity with sleep disorders.			
	x. The effects of fatigue as a result of commuting.			
	xi. Flightcrew member responsibility for ensuring adequate rest and fitness for duty.			
	xii. The effects of operating through multiple time zones.			
	xiii. Operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others.			
	xiv. Incorporate lessons learned regarding the effects of fatigue and mitigation initiatives relative to the air carrier's operations.			
	xvi. Use of a methodology that continually assesses the effectiveness of the training program.			

**Figure 3-171. Fatigue Risk Management Plan Review and Acceptance Job Aid
(Continued)**

G.	Fatigue Incident Reporting Process.			
	i. Does the FRMP have detailed procedures for reviewing and acting upon reports of events that may be attributable wholly or in part to fatigue which are similar to crew reports, and can serve as a mechanism for obtaining all relevant data regarding fatigue contributions to the incident.			
	ii. Does the FRMP consider other data sources such as procedural errors, flightcrew member deviations, flight exceedances, Aviation Safety Action Program (ASAP), or Aviation Safety Reporting System (ASRS) reports and Flight Operations Quality Assurance (FOQA) data helpful to the air carrier to objectively document fatigue?			
H.	System for Monitoring Flightcrew Fatigue.			
	i. Does the FRMP have a process to capture all relevant information, such as the schedule leading up to the fatigue event, the actions of the employee to obtain rest, subjective and objective evidence of fatigue, environmental conditions that may have contributed to fatigue, relevant health or medical conditions, specific actions related to the incident, and communications prior to and during the event?			
	ii. Does the FRMP have a corporate policy for the protection of privacy and methods to protect the employee from adverse actions that would discourage reports of fatigue?			
	iii. Does the FRMP define how an event is evaluated for potential fatigue involvement as well as defining the methodology used for conducting a detailed RCA?			
	iv. Does the FRMP contain operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others?			
I.	The Organization's FRMP Evaluation Program.			
	i. Does the FRMP have a systematic process for evaluating the effectiveness of the organization's FRMP?			
	ii. Does the FRMP define use of a methodology that continually assesses the effectiveness of the FRMP, including the effectiveness of the FRMP to improve alertness, and to mitigate performance errors?			
	iii. Does the FRMP have a process for determining the need for amending their FRMP, as appropriate, when it is determined that the FRMP is a policy or procedure that is no longer effective in managing a fatigue event?			

Section 2 Understanding and Applying Part 117

3-4690 GENERAL. This section provides guidance on applying the requirements prescribed in Title 14 of the Code of Federal Regulations (14 CFR) part 117 for managing and mitigating fatigue.

3-4691 UNDERSTANDING FATIGUE. Fatigue is characterized by a general lack of alertness and degradation in mental and physical performance. Fatigue manifests in the aviation context not only when pilots fall asleep in the cockpit in flight, but perhaps more importantly, when they are insufficiently alert during take-off and landing. Reported fatigue-related events have included procedural errors, unstable approaches, lining up with the wrong runway, and landing without clearances.

A. Types of Fatigue. There are three types of fatigue: transient, cumulative, and circadian.

1) Transient fatigue is acute fatigue brought on by extreme sleep restriction or extended hours awake within 1 or 2 days.

2) Cumulative fatigue is fatigue brought on by repeated mild sleep restriction or extended hours awake across a series of days.

3) Circadian fatigue refers to the reduced performance during nighttime hours, particularly during an individual's Window of Circadian Low (WOCL) (typically between 0200 and 0600.)

B. Fatigue Symptoms. Common symptoms of fatigue include:

- Measurable reduction in speed and accuracy of performance,
- Lapses of attention and vigilance,
- Delayed reactions,
- Impaired logical reasoning and decision-making, including a reduced ability to assess risk or appreciate consequences of actions,
- Reduced situational awareness, and
- Low motivation to perform optional activities.

C. Factors Contributing to Fatigue. A variety of factors contribute to whether an individual experiences fatigue as well as the severity of that fatigue. The major factors affecting fatigue include:

1) **Time of Day.** Fatigue is, in part, a function of circadian rhythms. All other factors being equal, fatigue is most likely and, when present, most severe between the hours of 0200 and 0600.

2) **Amount of Recent Sleep.** If a person has had significantly less than 8 hours of sleep in the past 24 hours, he or she is more likely to be fatigued.

3) Time Awake. A person who has been continually awake for a long period of time since his or her last major sleep period is more likely to be fatigued.

4) Cumulative Sleep Debt. For the average person, cumulative sleep debt is the difference between the amount of sleep a person has received over the past several days, and the amount of sleep he or she would have received with 8 hours of sleep a night.

5) Time on Task. The longer a person has continuously been doing a job without a break, the more likely he or she is to be fatigued.

6) Individual Variation. Individuals respond to fatigue factors differently and may become fatigued at different times, and to different degrees of severity under the same circumstances.

D. Managing Fatigue. Scientific research and experimentation have consistently demonstrated that adequate sleep sustains performance. For most people, 8 hours of sleep in each 24-hour period sustains performance indefinitely. Sleep opportunities during the WOCL are preferable because sleep that occurs during the WOCL provides the most recuperative value. Within limits, shortened periods of nighttime sleep may be nearly as beneficial as a consolidated sleep period when augmented by additional sleep periods, such as naps before evening departures, during flights with augmented flightcrews, and during layovers. Sleep should not be fragmented with interruptions. In addition, environmental conditions such as temperature, noise, and turbulence impact how beneficial sleep is and how performance is restored. When a person has accumulated a sleep debt, recovery sleep is necessary to fully restore the person's "sleep reservoir." Recovery sleep should include at least one physiological night; that is, one sleep period during nighttime hours in the time zone in which the individual is acclimated. The average person requires in excess of 9 hours of sleep a night to recover from a sleep debt.

E. Additional References. More information on fatigue may be found in the current edition of the following documents:

- Advisory Circular (AC) 120-100, Basics of Aviation Fatigue;
- AC 117-1, Flightcrew Member Rest Facilities;
- AC 117-2, Fatigue Education and Awareness Training Program;
- AC 117-3, Fitness for Duty; and
- Clarification of the Flight, Duty, and Rest Requirements of Part 117 (Docket No. FAA-2012-0358.)

3-4692 PART 117 APPLICABILITY.

A. Passenger-Carrying Operations. Part 117 applies to all passenger-carrying operations conducted by 14 CFR part 121 certificate holders regardless of whether the kind of operation being conducted is domestic, flag, or supplemental. Part 117 does not prescribe different limitations for each kind of operation being conducted under part 121. Therefore, if a part 121 certificate holder conducts passenger-carrying operations, that operation must be conducted in accordance with the provisions prescribed in part 117.

B. All-Cargo Operations. For those part 121 certificate holders conducting all-cargo operations, the certificate holder may continue to conduct its operations under the provisions prescribed in part 121, subparts Q, R, or S, as applicable. However, a part 121 certificate holder conducting all-cargo operations may opt to conduct its operations under the provisions prescribed in part 117. In order to prevent manipulation of this voluntary provision, certificate holders who wish to operate their all-cargo operations under part 117 cannot pick and choose specific flights to operate under this rule. Instead, the certificate holders conducting all-cargo operations wishing to operate under part 117 must select at least one of the following types of operations to operate under part 117:

- 1) All of their all-cargo operations conducted under contract to a U.S. Government agency; or
- 2) All of their all-cargo operations not conducted under contract to a U.S. Government agency.

C. Mixed Types of Operations. Part 121 certificate holders that conduct mixed types of operations (i.e., passenger-carrying and all-cargo operations) must comply with the provisions of part 117 for each passenger-carrying operation being conducted. For all-cargo operations, the certificate holder may continue to conduct its all-cargo operation under part 121, subparts Q, R, or S, as applicable. Instead of compliance with part 121, subparts Q, R, or S, the certificate holder may elect to apply the requirements and limitations prescribed in part 117 to its all-cargo operations. If, however, the certificate holder transports one passenger for compensation or hire on a flight, that flight must be conducted under the provisions of part 117. Certificate holders conducting mixed types of operations must develop a method acceptable to the Administrator for tracking and recording the flightcrew members' flight, duty, and rest times. This recordkeeping system must be applicable for both parts 117 and 121 to ensure compliance with the applicable part under which the flight is operated. These records must be made available to the Administrator for inspection as a means of demonstrating compliance with the applicable rules.

D. Part 117 Limitations as Applied to Part 91 Operations. Part 117 requirements and limitations apply to all 14 CFR part 91 operations (other than part 91 subpart K (91K)) that are directed by a part 121 certificate holder if any segment is conducted as a part 121 passenger flight. Part 117 also applies to all flightcrew members who are participating in a part 91 operation (other than part 91K) on behalf of a part 121 certificate holder if any flight segment is conducted as a part 121 passenger flight.

E. Part 91 Operations on Behalf of the Certificate Holder. If a flightcrew member flies a part 121 passenger flight segment and a part 91 ferry flight segment without being provided an intervening rest period that satisfies part 117, § 117.25, those flight segments would be part of the same Flight Duty Period (FDP). Consequently, just like the part 121 passenger flights, the part 91 ferry flight segment would have to be conducted under the flight, duty, and rest limitations of part 117. However, if a flightcrew member is provided with the rest period specified in § 117.25 between the part 91 ferry flight segment and the part 121 passenger flight segment, those flight segments would not be part of the same FDP. In that case, the part 91 ferry flight segment would not be subject to the flight, duty, and rest limitations of part 117. It is irrelevant whether the part 91 ferry flight segment takes place before or after the part 121

passenger flight segment; what matters is whether a rest period that satisfies § 117.25 was provided between the two flight segments.

F. Cumulative Limitations Relative to Part 91 Operations. The cumulative limitations prescribed in § 117.23 include all flying by flightcrew members on behalf of any certificate holder or 91K program manager. Thus, even if a part 91 flight is not operated pursuant to part 117, that flight still counts for purposes of the cumulative limitations of part 117 if it is flown on behalf of a certificate holder or 91K program manager. However, the part 117 cumulative limits can be exceeded while the flightcrew member is on a non-part 117 flight segment; that flightcrew member is simply prohibited from beginning the next part 117 flight segment if he or she cannot complete the part 117 segment within the pertinent cumulative limits.

3-4693 DEFINITIONS. In addition to the definitions in 14 CFR part 1, § 1.1 and 14 CFR part 110, § 110.2, the following definitions apply to part 117. In the event there is a conflict in definitions, the definitions in part 117 control.

A. Acclimated. Acclimated means a condition in which a flightcrew member has been in a theater for 72 hours or has been given at least 36 consecutive hours free from duty.

B. Airport/Standby Reserve. Airport/standby reserve means a defined duty period during which a flightcrew member is required by a certificate holder to be at an airport for a possible assignment.

C. Augmented. Augmented flightcrew means a flightcrew that has more than the minimum number of flightcrew members required by the airplane type certificate to operate the aircraft to allow a flightcrew member to be replaced by another qualified flightcrew member for in-flight rest.

D. Calendar Day. Calendar day means a 24-hour period from 0000 through 2359 using Coordinated Universal Time or local time.

E. Certificate Holder. Certificate holder means a person who holds or is required to hold an air carrier certificate or operating certificate issued under part 119 of this chapter.

F. Deadhead Transportation. Deadhead transportation means transportation of a flightcrew member as a passenger or non-operating flightcrew member by any mode of transportation, as required by a certificate holder, excluding transportation to or from a suitable accommodation. All time spent in deadhead transportation is duty and is not rest. For purposes of determining the maximum flight duty period in Table B of this part, deadhead transportation is not considered a flight segment.

G. Duty. Duty means any task that a flightcrew member performs, as required by the certificate holder including but not limited to flight duty period, flight duty, pre- and post-flight duties, administrative work, training, deadhead transportation, aircraft positioning on the ground, aircraft loading, and aircraft servicing.

H. Fatigue. Fatigue means a physiological state of reduced mental or physical performance capability resulting from lack of sleep or increased physical activity that can reduce a flightcrew member's alertness and ability to safely operate an aircraft or perform safety-related duties.

I. Fatigue Risk Management System (FRMS). Fatigue Risk Management System (FRMS) means a management system for a certificate holder to use to mitigate the effects of fatigue in its particular operations. It is a data-driven process and a systematic method used to continuously monitor and manage safety risks associated with fatigue-related error.

J. Fit for Duty. Fit for duty means physiologically and mentally prepared, and capable of performing assigned duties at the highest degree of safety.

K. Flight Duty Period (FDP). Flight duty period (FDP) means a period that begins when a flightcrew member is required to report for duty with the intention of conducting a flight, a series of flights, or positioning or ferrying flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flightcrew member. A flight duty period includes the duties performed by the flightcrew member on behalf of the certificate holder that occur before a flight segment or between flight segments without a required intervening rest period. Examples of tasks that are part of the flight duty period include deadhead transportation, training conducted in an aircraft or flight simulator, and airport/standby reserve, if the above tasks occur before a flight segment or between flight segments without an intervening required rest period.

L. Flight Time. Flight time means pilot time that commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing.

M. Home Base. Home base means the location designated by a certificate holder where a flightcrew member normally begins and ends his or her duty periods.

N. Lineholder. Lineholder means a flightcrew member who has an assigned flight duty period and is not acting as a reserve flightcrew member.

O. Long-Call Reserve. Long-call reserve means that, prior to beginning the rest period required by § 117.25, the flightcrew member is notified by the certificate holder to report for a flight duty period following the completion of the rest period.

P. Physiological Night's Rest. Physiological night's rest means 10 hours of rest that encompasses the hours of 0100 and 0700 at the flightcrew member's home base, unless the individual has acclimated to a different theater. If the flightcrew member has acclimated to a different theater, the rest must encompass the hours of 0100 and 0700 at the acclimated location.

Q. Report Time. Report time means the time that the certificate holder requires a flightcrew member to report for an assignment.

R. Reserve Availability Period (RAP). Reserve availability period (RAP) means a duty period during which a certificate holder requires a flightcrew member on short-call reserve to be available to receive an assignment for a flight duty period.

S. Reserve Flightcrew Member. Reserve flightcrew member means a flightcrew member who a certificate holder requires to be available to receive an assignment for duty.

T. Rest Facility. Rest facility means a bunk or seat accommodation installed in an aircraft that provides a flightcrew member with a sleep opportunity.

- Class 1 rest facility means a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flightcrew member to control light, and provides isolation from noise and disturbance.
- Class 2 rest facility means a seat in an aircraft cabin that allows for a flat or near flat sleeping position, is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or flightcrew members.
- Class 3 rest facility means a seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

U. Rest Period. Rest period means a continuous period determined prospectively during which the flightcrew member is free from all restraint by the certificate holder, including freedom from present responsibility for work should the occasion arise.

V. Scheduled. Scheduled means to appoint, assign, or designate for a fixed time.

W. Short-Call Reserve. Short-call reserve means a period of time in which a flightcrew member is assigned to a reserve availability period.

X. Split-Duty. Split-duty means a flight duty period that has a scheduled break in duty that is less than a required rest period.

Y. Suitable Accommodation. Suitable accommodation means a temperature-controlled facility with sound mitigation and the ability to control light that provides a flightcrew member with the ability to sleep either in a bed, bunk, or in a chair that allows for flat or a near-flat sleeping position. Suitable accommodation only applies to ground facilities and does not apply to aircraft onboard rest facilities.

Z. Theater. Theater means a geographical area in which the distance between the flightcrew member's flight duty period departure point and arrival point differs by no more than 60 degrees longitude.

AA. Unforeseen. Unforeseen operational circumstance means an unplanned event of insufficient duration to allow for adjustments to schedules, including unforecast weather, equipment malfunction, or air traffic delay that is not reasonably expected.

BB. Window of Circadian Low (WOCL). Window of circadian low (WOCL) means a period of maximum sleepiness that occurs between 0200 and 0559 during a physiological night.

3-4694 FITNESS FOR DUTY (§ 117.5).

A. Minimum Rest Opportunity Prior to Starting an FDP or Reserve Period.

Part 117 requires the flightcrew member to receive a minimum of a 10-hour rest period immediately before reporting for a FDP or reserve period. This rest period must provide the flightcrew member with 8 uninterrupted hours of sleep opportunity.

B. Fitness for Duty: Flightcrew Member's Responsibility. It is the responsibility of the flightcrew member to use their assigned sleep opportunity to gain the proper rest prior to reporting for an FDP. Part 117 requires each flightcrew member to be fit for duty when reporting for any FDP, well rested, and prepared to perform his or her duties, as assigned. This requirement rests solely with the flightcrew member.

C. Fitness for Duty: Joint Responsibility. Part 117 assigns joint responsibility between the flightcrew member and the certificate holder with regard to fitness for duty. Subsection 117.5(b) establishes this joint responsibility by prohibiting the certificate holder from assigning, and the flightcrew member from accepting, an assignment to a flight duty period if that flightcrew member has reported too fatigued to safely perform his or her assigned duties.

D. Removing a Fatigued Flightcrew Member from Duty. Section 117.5(c) states that the certificate holder may not permit a flightcrew member to continue an FDP if that flightcrew member has reported him or herself too fatigued to safely continue their assigned duties.

E. Affirming Fitness for Duty. Each flightcrew member must affirmatively state he or she is fit for duty prior to commencing a flight. This statement, affirming the flightcrew member's fitness for duty, is signified by that flightcrew member signing the flight's dispatch/release, as appropriate, attesting they are fit for duty. While a flightcrew member may have reported fit for duty at the beginning of their FDP, extenuating circumstances could have occurred during their FDP resulting in the flightcrew member becoming too fatigued to continue their assigned FDP. Part 117 contemplates this situation and, therefore, requires each flightcrew member to attest their fitness for duty at the beginning of each flight segment for which he or she is assigned.

F. Demonstrating Compliance With § 117.5. The certificate holder will be responsible for developing the following:

1) A statement in the certificate holder's operating manual stating that it is the responsibility of each flightcrew member to be fit for duty prior to reporting for any FDP.

2) A statement in the certificate holder's operating manual that the certificate holder may not assign, and that flightcrew member may not accept, an assignment for an FDP if that flightcrew member has reported him or herself too fatigued to perform or continue an assigned FDP.

3) A statement in the certificate holder's operating manual declaring that the certificate holder will not permit a flightcrew member to continue an FDP if that flightcrew member has reported him or herself too fatigued to continue an assigned FDP.

4) An acceptable method and applicable procedures for flightcrew members to, as part of the dispatch/flight release, affirmatively attest they are fit for duty for each flight segment they are assigned as operating flightcrew member. These procedures will be reflected in the certificate holder's operating manual.

G. Additional References. More information on fitness for duty may be found in the current edition of the following documents:

- AC 117-3, Fitness for Duty;
- Part 117 Preamble.

3-4695 FATIGUE RISK MANAGEMENT SYSTEMS (FRMS) (§ 117.7). Each part 121 certificate holder conducting operations under part 117 must comply with the applicable requirements and limitations of part 117, unless otherwise approved under an FRMS. The FRMS is an alternative method of compliance (AMOC) developed by the certificate holder and approved by the Federal Aviation Administration (FAA) with specific conditions and limitations applicable to the authorization that require certificate holder compliance when operating under that FRMS authorization.

A. FRMS as an AMOC. An FRMS is an optional approach to prescriptive regulations. A certificate holder seeking to exceed a limitation in part 117 or in part 121, subparts Q, R, or S, would do so under an FAA authorization. An FRMS is largely developed as an AMOC to prescriptive limitations based upon objective performance standards. A certificate holder may be authorized to apply an FRMS to any part or all of its operation, provided that the certificate holder demonstrates an effective AMOC that meets or exceeds the safety standards afforded by the prescriptive limitations. Unlike a Fatigue Risk Management Plan (FRMP) that is required for each certificate holder conducting operations under part 121, the FRMS is an AMOC to prescriptive limitations that the certificate holder may implement for fatigue management and mitigation.

B. FRMS as a Management System. An FRMS is a management system for a certificate holder to use to mitigate the effects of fatigue in its particular operations. An FRMS is a data-driven system, based largely upon scientific principles and operational knowledge that allows for continuous monitoring and management of safety risks associated with fatigue-related error. An FRMS is a fatigue mitigation tool that minimizes the acute and chronic sources of fatigue and manages the potential risks associated with fatigue. The FRMS is part of a repetitive performance improvement process that leads to continuous safety enhancements by identifying and addressing fatigue factors across time and changing physiological and operational circumstances. The objective of the FRMS is to manage, monitor, and mitigate the effects of fatigue to improve flightcrew member alertness and reduce performance errors.

C. FRMS Applications. FRMS applications are submitted to AFS-200 for review, processing, and approvals. Any FRMS applications received by the POI should be forwarded to AFS-200.

D. Responsibility for FRMS Approvals and Authorizations. FRMS approvals and authorizations are the responsibility of AFS-200.

E. Operating Under the Provisions of an FRMS. When operating under an FRMS authorization, the certificate holder must designate on the dispatch/release that the flight is operating under the specific FRMS authorization.

F. Additional References. More information on FRMS may be found in the current edition of AC 120-103, Fatigue Risk Management Systems for Aviation Safety

3-4696 FATIGUE EDUCATION AND AWARENESS TRAINING PROGRAMS

(§ 117.9). Each part 121 certificate holder operating under part 117 must develop, implement, update, and maintain an FAA-approved Fatigue Education and Awareness Training Program, as prescribed in § 117.9. Fatigue training is an essential element to mitigating potential fatigue risks. The Fatigue Education and Awareness Training Program required under § 117.9 is an expansion of the FRMP training requirements outlined in Public Law (PL) 111-216, § 212(b)(2)(B). These training requirements are designed to provide annual education and awareness training to all employees of the certificate holder responsible for administering the provisions of part 117, including flightcrew members, dispatchers, individuals directly involved in the scheduling of flightcrew members, individuals directly involved in operational control, and any employee providing direct management oversight of those areas. The objective of the training program is to educate and improve the awareness of these employee groups in an effort to increase their understanding of the effects of fatigue relative to the safety of flight.

A. Training Program Elements. The fatigue-training requirements outlined in the certificate holder's FAA-accepted FRMP must be incorporated into its operator-specific FAA-approved ground training curriculum. The frequency of this training must be every 12 calendar-months, unless otherwise required by the certificate holder's operations specifications. At a minimum, the Fatigue Education and Awareness Training program must include the following:

- Review of FAA flight, duty, and rest regulatory requirements.
- Awareness of the FRMP program itself, including fatigue-related policies and procedures, and the responsibilities of management and employees to mitigate or manage the effects of fatigue and improve flightcrew member flight deck alertness.
- The basics of fatigue, including sleep fundamentals and circadian rhythms.
- The causes and awareness of fatigue.
- The effects of operating through multiple time zones.
- The effects of fatigue relative to pilot performance.
- Fatigue countermeasures, prevention, and mitigation.
- The influence of lifestyle, including nutrition, exercise, and family life on fatigue.
- Familiarity with sleep disorders.

- The effects of fatigue as a result of commuting.
- Pilot responsibility for ensuring adequate rest and fitness for duty.
- Operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others.
- Incorporate lessons learned regarding the effects of fatigue and mitigation initiatives relative to the certificate holder's operations.
- The certificate holder must use a methodology that continually assesses the effectiveness of their training program.

B. Training Program Audience. The training applies to all employees responsible for administering the provisions of the new rule, including flightcrew members, dispatchers, individuals directly involved in the scheduling of flightcrew members, individuals directly involved in operational control, and any employee providing direct management oversight of those areas.

C. Training Program Updates. Each part 121 certificate holder operating under part 117 must update their Fatigue Education and Awareness Training Program every 24 calendar-months. As noted in the preamble to part 117, the rule adopted the mandatory two-year update requirements of each part 121 certificate holders' education and training program (refer to PL 111–216, § 212(b)(4)(A) and (B)). The certificate holder's education and training program expires 24-calendars after approval. Thus, each certificate holder must update their education and training program every 24-calendar months. As noted in the preamble to part 117 and prescribed in § 117.9(c)(1)(2), the certificate holder should submit their update to the FAA for review 12 months prior to the expiration date of their training program.

D. FAA-Approval of the Training Program. The certificate holder's initial fatigue education and awareness training program and all non-minor changes to that program must receive FAA approval per § 117.9(a) prior to implementation. Minor changes to the training program only need to be accepted by the FAA and need not go through the approval process. For the purposes of clarity, a minor change includes correcting grammatical errors, typos, and non-substantive data. A change to any element of the training program would be considered a major change. A major change to the fatigue education and awareness training program would be considered a new program, and this change would have to be approved by the FAA before it is implemented.

E. Demonstrating Compliance With § 117.9. The certificate holder will be responsible for the following:

1) An initial fatigue education and awareness training program that is consistent with the training elements identified in OpSpec A317 and AC 117-2.

2) Placing the following statement in the training program that identifies the target audience: "The training applies to all employees responsible for administering the provisions of the new rule, including flightcrew members, dispatchers, individuals directly involved in the scheduling of flightcrew members, individuals directly involved in operational control, and any employee providing direct management oversight of those areas."

3) A statement in the certificate holder's training program requiring them to submit an update to their fatigue education and awareness training program every 24-calendar months from the date of initial approval of the fatigue education and awareness training program. As prescribed in § 117.9(c)(1)(2), updates should be submitted to the FAA at least 12 months prior to the 24-calendar month expiration date.

F. Additional References. More information on Fatigue Education and Awareness Training Programs may be found in the current editions of:

- AC 120-100, Basics of Aviation Fatigue;
- AC 117-2, Fatigue Education and Awareness Training Programs;
- Public Law 111-216, § 212(b), Fatigue Risk Management Plans; and
- Operations Specification (OpSpec) A317, Acceptance of a Fatigue Risk Management Plan.

3-4697 FLIGHT TIME LIMITATIONS (§ 117.11).

A. Background. Studies have shown that after a person works for approximately eight or nine hours during a day, the risk of an accident increases exponentially for each additional hour worked. According to a series of studies that examined the national rate of accidents as a function of the amount of hours worked, the risk of an accident in the 12th hour of a work shift is more than double the risk of an accident in the 8th hour of a work shift. To mitigate the risk of fatigue setting in while on duty, the flight time limits in Table A of part 117 (unaugmented operations) restrict a flightcrew member's time on task (flight time) to either 8 or 9 hours during the unaugmented flightcrew member's FDP.

NOTE: Augmented flightcrew operations provide an added layer of safety by increasing the number of flightcrew members assigned to a flight or series of flights, above the required crew complement. This enables the flightcrew members to take an in-flight rest period, thus reducing fatigue and improving flightcrew member alertness. By using augmentation, the certificate holder gains additional flexibility as a result of longer FDPs and increased flight time limits. Augmentation adds a higher level of safety to compensate for the longer FDP and flight time limits.

B. Flight Time Limitations. Part 117 prescribes separate FTLs for unaugmented and augmented flightcrew member operations.

1) Unaugmented Flightcrew Member Operations. Unaugmented FTLs are prescribed in § 117.11(a)(1). The flightcrew member's applicable FTLs are predicated upon the "Time of Report," which is limited to eight or nine hours. If the flightcrew member's time of report occurs between 2000 hours and 0459 hours, the limit is eight hours during that FDP. If, however, the flightcrew member's time of report occurs between 0500 and 1959, then the FTL is nine hours for that FDP. (See Figure 3-161, Table A to Part 117-Maximum Flight Time Limits for Unaugmented Operations).

2) Augmented Flightcrew Member Operations. FTLs for augmented flightcrew member operations are prescribed in § 117.11(a)(2)(3).

a) Three pilots: a flightcrew consisting of three pilots is limited to 13 hours of flight time during that FDP.

b) Four pilots: a flightcrew consisting of four pilots is limited to 17 hours of flight time during that FDP.

Figure 3-161. Table A to Part 117 - Maximum Flight Time Limits for Unaugmented Operations

Table A to Part 117 – Maximum Flight Time Limits for Unaugmented Operations	
Time of report (acclimated)	Maximum flight time (hours)
0000-0459	8
0500-1959	9
2000-2359	8

C. Determining FTLs. FTLs rest within the limits of the flightcrew member’s assigned FDP. An FDP is a period that begins when a flightcrew member is required to report for duty with the intention of conducting a flight or series of flights.

1) Unaugmented Flightcrew Member. The maximum FTL for an unaugmented flightcrew member may be found in Table A of part 117 (see Figure 3-161). The Time of Report is the actual time in which the flightcrew member reports for their FDP.

2) Augmented Flightcrew Member. The maximum FTL is determined based on the time in which the flightcrew member reports for duty. An augmented flightcrew member’s FTLs may be found in § 117.11(a)(2)(3).

D. FTL Constraints. As previously stated, a flightcrew member’s FTL must be within the limits of their maximum applicable FTL limit. A flightcrew member may not take off on a flight segment if he or she does not have a reasonable expectation that the flight segment will be completed within the maximum FTL limit.

E. FTL Extensions. If unforeseen operational circumstances arise after takeoff a flightcrew member may exceed the maximum flight time and the cumulative flight time limits (as prescribed in § 117.23(b)) to the extent necessary to safely land the aircraft at the next destination airport or alternate, as appropriate.

F. Reporting Flight Time Extensions. In the event a flightcrew member’s FTL is extended, the certificate holder must report that extension to the FAA within 10 days following the flight time extension. The report must include a description of the extended flight time limitation and the circumstances surrounding the need for the extension.

G. Cumulative Flight Time Limits. As prescribed in § 117.23(b)(1)(2), cumulative FTLs function using the following rolling windows: 672 consecutive hours (rolling 28-day period) or 365 consecutive calendar-day (a rolling 365-day period). A flightcrew member's cumulative FTLs shall not exceed:

- 1) 100 hours in any 672 consecutive hours, or
- 2) 1000 hours in any 365 consecutive calendar-day period.

H. Demonstrating Compliance With § 117.11. The certificate holder will be responsible for implementing and demonstrating the following:

- 1) A method for tracking unaugmented and augmented flightcrew member's flight times to ensure compliance with the applicable limits of § 117.11(a)(1)(2)(3).
- 2) A method for ensuring compliance with the cumulative FTL prescribed in § 117.23(b)(1)(2).
- 3) A method for reporting flight time extensions to the FAA as specified in § 117.11(b)(c)(d).
- 4) A statement in the certificate holder's operating manual that states flight time extensions may only be applied after takeoff, and only to the extent necessary to safely land at the next destination or alternate airport, as appropriate.
- 5) Procedures for identifying and implementing corrective actions as specified in § 117.11(c) and (d).

3-4698 FLIGHT DUTY PERIOD. An FDP is defined as a period that begins when a flightcrew member is required to report for duty with the intention of conducting a flight, a series of flights, or positioning or ferrying flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flightcrew member. Additionally, an FDP includes the duties performed by the flightcrew member on behalf of the certificate holder that occur before a flight segment, or between flight segments, without a required intervening rest period. Examples of tasks that are part of the flight duty period include deadhead transportation, training conducted in an aircraft or flight simulator, and airport/standby reserve, if the above tasks occur before a flight segment or between flight segments without an intervening required rest period.

A. Maximum FDP Limits. One of the regulatory concepts of part 117 is the restriction on flightcrew members' maximum FDP limits. In creating maximum FDP limits, the rule addresses three primary fatigue concerns:

- 1) Flightcrew members' circadian rhythms needed to be addressed because studies have shown that flightcrew members who fly during their WOCL can experience severe performance degradation.

2) The amount of time spent at work needed to be taken into consideration because longer shifts increase fatigue.

3) The number of flight segments in a duty period needed to be taken into account because flying more segments requires more takeoffs and landings, which are both the most task-intensive and the most safety-critical stages of flight.

B. Individual FDP Limits. Under part 117, a flightcrew member is assigned an FDP limit based upon the scheduled time of start for that FDP. An FDP limit applies to the individual flightcrew member, not the crew as a whole. Therefore, within a crew, each flightcrew member could have a different maximum FDP limit. Flightcrew member's FDP limits incrementally decrease the later in the day in which the schedule time of start occurs for both unaugmented and augmented operations. In addition:

1) **Unaugmented Operations.** Unaugmented flightcrew member's maximum FDP limits will incrementally decrease as flight segments increase. These decrements mostly occur after the fourth segment, essentially representing a 30-minute decrement per segment. This decrease will continue to seven segments, where the limit remains consistent for each segment beyond seven segments. FDPs that have a Scheduled Time of Start between 0000-0359 have the shortest limit, which is nine hours, regardless of the number of segments flown.

2) **Augmented Operations.** An augmented flightcrew member's maximum FDP limit will decrease with the use of a lower-class rest facility (i.e., Class 3 instead of a Class 2) along with the number of pilots assigned to that FDP.

C. FDP Scheduled Time of Start. The Scheduled Time of Start for an FDP is created once that FDP has been assigned to a flightcrew member. In order to change this scheduled reporting time, the flightcrew member would have to be shifted into either long-call or short-call reserve assignment for that pertinent FDP.

D. Flightcrew Member's Start Time-Acclimated or Unacclimated Status. Knowing the acclimation status of a flightcrew member is essential in determining that flightcrew member's maximum FDP limit. Regardless of whether the flightcrew member is operating in an augmented or unaugmented operation, if the flightcrew member is unacclimated, that flightcrew member's maximum FDP limit must be reduced by 30 minutes. To determine the flightcrew member's maximum FDP limit, he/she must enter the appropriate time under the header titled "Scheduled Time of Start." The time of start assumes the flightcrew member is acclimated.

1) **Acclimated Flightcrew Member.** An acclimated flightcrew member may use local time when entering Tables B or C of part 117. The flightcrew member may also use base time if acclimated to a theater that encompasses his or her home base. This essentially becomes the acclimation point (e.g., JFK time) the flightcrew member will use for entering the appropriate table. Stated differently, the flightcrew member will enter the appropriate table using the local time of the point where they are acclimated, or they may use the local time of their base, if their base is within the theater to which they are acclimated. For example, a flightcrew member begins a series of FDPs in JFK, and is based in ORD, the flightcrew member could use either JFK or ORD time. The certificate holder will determine and declare whether local or base time will be

used; however, once determined and declared, the flightcrew member will use that time (local or base) when entering the tables until that flightcrew member receives 30 consecutive hours of rest (§ 117.25(b)) or acclimates to a new theater. If the flightcrew member's base is NOT in the theater to which the flightcrew member is acclimated, the flightcrew member must use the local time where the series of FDPs started. If, however, the flightcrew member acclimates to a new theater, which requires 36 consecutive hours rest or 72 hours in the new theater, the point to which the flightcrew member acclimates now becomes their new acclimation (or reference) point. The flightcrew member is now considered acclimated to that point and will enter the tables based on the local time of that point.

2) Unacclimated Flightcrew Member. If a flightcrew member is unacclimated, the flightcrew member will enter Table B or C of part 117 based on the local time where they were last acclimated. The flightcrew member will remain unacclimated until he/she re-enters the theater to which he/she is acclimated, or receives 36 consecutive hours of rest, or remains in the new theater for 72 hours, which acclimates the flightcrew member to a new theater.

E. Determining FDP Limits. A flightcrew member's maximum FDP limit is determined by the use of either Table B of part 117 for unaugmented operations (See Figure 3-162, Table B to Part 117 – Flight Duty Period: Unaugmented Operations) or Table C of part 117 for augmented operations (See Figure 3-163, Table C to Part 117 – Flight Duty Period: Augmented Operations):

1) Unaugmented Operations. Determine if the flightcrew member is acclimated or unacclimated. If the flightcrew member is acclimated, the time entered will be based on the local time where the series of FDPs (or single FDP) started, or the flightcrew member's base time. Base time may only be used if the flightcrew member's base is in the theater to which he/she is acclimated. If the flightcrew member is unacclimated, then the flightcrew member will use the time at the point where he/she was last acclimated (the use of base time is not applicable). Enter Table B (Figure 3-162) under the header titled "Schedule Time of Start." Identify the time started using the local or base time (as applicable) if acclimated, or the time at the point last acclimated for a flightcrew member that is unacclimated. Under the header titled "Number of Flight Segments," identify the number of segments to be flown (or actually flown). Extend vertically from that point until intersecting with the row that contains the time started. The point at which these data points intersect identifies the flightcrew member's maximum FDP limit. Increasing or decreasing the number of flight segments flown may result in a change to the flightcrew member's maximum FDP limit. However, for the purpose of determining the flightcrew member's maximum applicable FDP limit, a flight segment that results in a diversion is not counted to the limit. Additionally, a change in the "Scheduled Time of Start" range will impact the maximum FDP limit.

2) Augmented Operations. Determine if the flightcrew member is acclimated or unacclimated. If the flightcrew member is acclimated, the time entered will be based on the local time where the series of FDPs (or single FDP) started, or the flightcrew member's base time. Base time may only be used if the flightcrew member's base is in the theater to which he/she is acclimated. If the flightcrew member is unacclimated, then the flightcrew member will use the time at the point where he/she was last acclimated (the use of base time is not applicable.) Enter Table C (Figure 3-163) under the header titled "Schedule Time of Start." Identify the time started

using the local or base time (as applicable) if acclimated, or the time at the point last acclimated for a flightcrew member that is unacclimated. Under the header titled, “Maximum flight duty period based on rest facility and number of pilots,” identify the class of rest facility being used, and then the number of pilots assigned to that FDP. Extend vertically from that point until intersecting the row containing the time scheduled to start. The point at which these data points intersect identifies the flightcrew member’s maximum FDP limit. A change in the flightcrew member’s maximum FDP limit will result if the number of pilots assigned, the class of rest facility used is changed, or the “Scheduled Time of Start” is outside the range for that timeframe.

3) Unacclimated Flightcrew Member. For either unaugmented or augmented operations, if the flightcrew member is unacclimated, that flightcrew member’s maximum FDP limit, as determined in Table B or C, must be reduced by 30 minutes.

Figure 3-162. Table B to Part 117 – Flight Duty Period: Unaugmented Operations

Table B to Part 117 – Flight Duty Period: Unaugmented Operations							
Scheduled time of start (acclimated time)	Maximum flight duty period (hours) for lineholders based on number of flight segments						
	1	2	3	4	5	6	7+
0000-0359	9	9	9	9	9	9	9
0400-0459	10	10	10	10	9	9	9
0500-0559	12	12	12	12	11.5	11	10.5
0600-0659	13	13	12	12	11.5	11	10.5
0700-1159	14	14	13	13	12.5	12	11.5
1200-1259	13	13	13	13	12.5	12	11.5
1300-1659	12	12	12	12	11.5	11	10.5
1700-2159	12	12	11	11	10	9	9
2200-2259	11	11	10	10	9	9	9
2300-2359	10	10	10	9	9	9	9

Figure 3-163. Table C to Part 117 – Flight Duty Period: Augmented Operations

Table C to Part 117 – Flight Duty Period: Augmented Operations						
Scheduled time of start (acclimated time)	Maximum flight duty period (hours) based on rest facility and number of pilots					
	Class 1 rest facility		Class 2 rest facility		Class 3 rest facility	
	3 pilots	4 pilots	3 pilots	4 pilots	3 pilots	4 pilots
0000-0559	15	17	14	15.5	13	13.5
0600-0659	16	18.5	15	16.5	14	14.5
0700-1259	17	19	16.5	18	15	15.5
1300-1659	16	18.5	15	16.5	14	14.5
1700-2359	15	17	14	15.5	13	13.5

F. Demonstrating Compliance With §§ 117.13 and 117.17. The certificate holder will be responsible for developing, implementing, and demonstrating the following:

- 1) A method for determining a flightcrew member's maximum FDP limits for each flightcrew member assigned to a flight.
- 2) Inserting a copy of Tables A, B, and C of part 117 into their operating manual.
- 3) A process for determining when a flightcrew member is acclimated and at what point he/she becomes unacclimated. This process should include a process for adjusting the flightcrew member's maximum FDP limit.
- 4) Policies and procedures for declaring whether the certificate holder will use local or base time. The policies and procedures should include methods for notifying the flightcrew member of this declaration.
- 5) Policies and procedures for changing a flightcrew member's assignment when the actual time of start of an FDP differs from the scheduled time of start, as assigned to the flightcrew member.

3-4699 FLIGHT DUTY PERIOD EXTENSIONS (§ 117.19). Part 117 allows for the extension of a flightcrew member's maximum FDP limit under specific conditions and limitations. Section 117.19 provides for two conditions under which a flightcrew member's FDP may be extended:

- A post takeoff FDP extension, and
- A pretakeoff FDP extension.

A. Post takeoff FDP Extension. The post takeoff FDP extension applies to an FDP in which a situation arises after takeoff that would cause a flightcrew member to exceed the pertinent FDP limit. This type of extension is more generous than a pretakeoff FDP extension because once an airplane is in the air, the certificate holder and pilot in command (PIC) have

very little discretion concerning FDPs and flight time limits, as they cannot change the flightcrew while the plane is in the air.

B. Pretakeoff FDP Extension. For situations that are known before takeoff that would cause a flightcrew member to exceed the pertinent FDP limit, only the more stringent pretakeoff FDP extensions can be utilized. That is because the certificate holder and PIC have more options for dealing with unexpected situations that arise while the plane is still on the ground. Thus, the distinction between pre- and post-takeoff FDP extensions comes from determining whether the flightcrew member and certificate holder had a reasonable expectation before takeoff that the flight segment would be completed within the pertinent FDP limit.

C. Construct of an FDP. Tables B and C of part 117 prescribe the maximum FDP limits. A 30-minute period exists at the end of each FDP, which may not be used for scheduling a flightcrew member. The purpose for this 30-minute period is simply a buffer that may be used in the event the flightcrew member's actual FDP runs over the maximum FDP limit by 30 minutes or less.

D. Applying a Pretakeoff FDP Extension. If unforeseen operational circumstances arise prior to takeoff, a flightcrew member's maximum FDP limit may be extended up to a maximum of 2 hours beyond their maximum FDP limit. Once a flightcrew member's maximum FDP limit has been extended by more than 30 minutes, that flightcrew member must receive a 30 consecutive hour rest period (as described in § 117.25(b)) before that flightcrew member may accept another FDP extension exceeding 30 minutes. The following conditions and limitations apply to pretakeoff FDP extensions:

- 1) An FDP extension requires joint concurrence between the certificate holder and the PIC.
- 2) An FDP extension may be applied to either Table B (unaugmented) or Table C (augmented) FDP limits.
- 3) The maximum length of an FDP extension is 2 hours. However, a flightcrew member may accept an FDP extension that is more than 30 minutes but less than the maximum 2-hour limit.
- 4) A pretakeoff FDP extension cannot be utilized if it causes a flightcrew member to exceed the cumulative FDP limits specified in § 117.23(c).
- 5) A flightcrew member cannot accept another FDP extension exceeding 30 minutes until that flightcrew member has received a 30 consecutive hour rest period, as prescribed in § 117.25(b).

E. Reporting Pretakeoff FDP Extensions. Each certificate holder must, within 10 days, report to the FAA any FDP that exceeded the maximum FDP permitted in Tables B or C by more than 30 minutes. The report must contain the following:

- 1) A description of the extended FDP and the circumstances surrounding the need for the extension;

2) If the circumstances giving rise to the extension were within the certificate holder's control, the corrective action(s) that the certificate holder intends to take to minimize the need for future extensions; and

3) The certificate holder must implement the corrective action(s) identified in this report within 30 days from the date of the extended FDP.

F. Applying a Post takeoff FDP Extension. If unforeseen operational circumstances arise after takeoff, the PIC and the certificate holder may extend a flightcrew member's maximum FDP limits specified in Tables B or C of part 117 to the extent necessary to safely land the aircraft at the next destination airport or alternate airport, as appropriate. The following conditions and limitations apply to post takeoff FDP extensions:

1) FDP extension may be applied to either Table B (unaugmented) or Table C (augmented) FDP limits.

2) An extension of a flightcrew member's maximum FDP limit by more than 30 minutes may occur only once prior to receiving a 30 consecutive hour rest period described in § 117.25(b).

3) A post takeoff FDP extension may exceed the cumulative FDP limits specified in § 117.23(c).

4) The certificate holder must report to the FAA within 10 days any FDP that exceeded the maximum FDP limits permitted by Tables B or C of part 117.

5) The report must contain a description of the circumstances surrounding the affected FDP.

G. Operational and Regulatory Considerations. FDP limits are applicable to a single flightcrew member, not the crew. Under § 117.19(a)(2) and (b)(2), an FDP extension of a flightcrew member's maximum FDP limit that is greater than 30 minutes can only be taken once before that flightcrew member is provided with 30 consecutive hours of rest, as prescribed in § 117.25(b). Therefore, if a flightcrew member had their maximum FDP limit extended beyond the 30 minutes, that flightcrew member could not take another FDP extension until receiving the 30 consecutive hour rest period reset. Thus, that flightcrew member and the certificate holder would be in violation of part 117 if that flightcrew member exceeds the pertinent FDP limits by more than 30 minutes. It is irrelevant that the FDP limit exceedance would have been caused by unforeseen operational circumstances. To that end, once a flightcrew member uses an FDP extension, the FAA strongly recommends that the certificate holder add buffers to that crewmember's schedule to account for possible unexpected events, reassign that flightcrew member, or provide that crewmember with a 30-hour rest period as soon as possible in order to reset the flightcrew member for an FDP extension.

H. Evidence of FDP Extension Concurrence. A record of PIC concurrence can take any reasonable form as long as there is evidence that the PIC concurred with the extension. For example, the PIC could note his/her concurrence with an FDP extension on a dispatch/flight release or in an ACARS message.

I. FDP Extensions Less Than 2 Hours. If the PIC believes that the flightcrew is too fatigued for a two-hour FDP extension, the PIC could concur to a shorter FDP extension that he/she believes could safely be carried out by the flightcrew. Additionally, pursuant to § 117.5, each flightcrew member would also have to certify that he/she would not be too fatigued to operate the aircraft during the extension.

J. FDP Extensions That Exceed Cumulative Limits. Under § 117.19(b)(3), a post takeoff FDP extension allows a flightcrew member to exceed the cumulative FDP limits. However, a post takeoff FDP extension is limited in that it expires once the airplane lands. Once the flight on which the post takeoff extension was used has been completed, the flightcrew member would again be bound by the cumulative FDP limitations. Thus, the post takeoff FDP extension allows a flightcrew member to exceed the cumulative FDP limits only to the extent necessary to complete the flight on which the extension is utilized.

K. Submitting FDP Extension Reports. The certificate holder will submit all FDP extension reports, circumstances for the extension, and corrective actions, as necessary, to the principal operations inspector.

L. Demonstrating Compliance With § 117.19. The certificate holder will be responsible for developing, implementing and demonstrating the following:

1) Procedures for the certificate holder and the PIC to follow when extending an FDP.

2) Outline the limits of the FDP extension, as specified in § 117.19.

3) Method for archiving PIC concurrences after accepting an FDP extension.

4) Procedures for ensuring the flightcrew member receives a 30 consecutive hour rest period, as specified in § 117.25(b), prior to accepting another FDP extension.

5) Statement in the certificate holder's operating manual that when a pretakeoff extension of an FDP is applied, the FDP cumulative limitations specified in § 117.23(c) may not be exceeded.

6) Detailed procedures for reporting FDP procedures, determining the root-cause, and developing and implementing the necessary corrective actions.

7) Policy statement that post takeoff extensions may only be used to the extent necessary to safely land the aircraft at the next destination or alternate airport, as appropriate.

3-4700 REST FACILITIES. Rest is the best form of fatigue mitigation based upon the quality of rest received. Onboard flightcrew member rest facilities are designed to provide one of three qualities of rest: good, fair, or poor. Part 117 defines and classifies onboard flightcrew member rest facility criteria. As defined in part 117, a rest facility means bunk or seat accommodation installed in an aircraft that provides a flightcrew member with a sleep opportunity.

A. Classification of Rest Facilities. Rest facilities are classified into three categories: Class 1, Class 2 or Class 3. An essential factor in determining an augmented flightcrew member's maximum FDP limit is the classification of rest facility being used. A Class 1 rest facility provides the best quality of rest, therefore provides a longer FDP limit than a Class 3 rest facility, which provides the least quality of the three classes. For this reason a rest facility must be qualified as meeting one of the following criteria:

1) Class 1 rest facility means a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature controlled, allows the flightcrew member to control light, and provides isolation from noise and disturbance.

2) Class 2 rest facility means a seat in an aircraft cabin that allows for a flat or near flat sleeping position; is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation; and is reasonably free from disturbance by passengers or flightcrew members.

3) Class 3 rest facility means a seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

B. Operations Specifications (OpSpec) A117. When a certificate holder conducts augmented flightcrew operations, the certificate holder must have OpSpec A117 issued identifying the aircraft and classification of rest facility used in augmented flightcrew operations. OpSpec A117 identifies aircraft with onboard rest facilities by the registration and serial number, make, model, and series (M/M/S), the classification of rest facility and the number of sleep surfaces installed under that classification. OpSpec A117 provides the certificate holder, flightcrew member and inspector with the necessary information to determine the applicable FDP limits for an augmented flightcrew member.

C. Significance of Rest Facility Classification. Each rest facility has a classification ranking from one through three that defines the maximum flight duty period (FDP) limits predicated on the flightcrew member's start time, the number of pilots and the classification of rest facility to be used for augmented flightcrew operations. A Class 1 facility provides for the longest FDP, a Class 2 provides for the second longest FDP, and a Class 3 provides for the third longest FDP.

D. Specific Guidance for Qualifying Rest Facilities. The current edition of AC 117-1, Flightcrew Member Rest Facilities, provides guidance on qualifying rest facilities and the issuance of OpSpec A117.

E. Additional References. More information on rest facilities may be found in:

- AC 117-1, Flightcrew Member Rest Facilities
- TNO Report

3-4701 AUGMENTATION.

A. Use of Augmentation. Augmentation enables the certificate holder to use longer FDP limits by: (1) using rest facilities; and (2) increasing the number of flightcrew members assigned to a flight, above the minimum required flightcrew member complement. As a result, each flightcrew member is able to receive in-flight rest and the workload is shared among 3 or 4 flightcrew members, as opposed to 2 flightcrew members, thereby, reducing the effects of fatigue. Augmented flightcrew member operations also enable higher flight time limits based upon either a 3- or 4-pilot operation. When augmented flightcrew member operations are used, the aircraft assigned to that flight must have an installed rest facility that meets the criteria of a Class 1, 2, or 3 rest facility, and that aircraft information must be reflected in OpSpec A117.

1) When is Augmentation Required? Augmentation is required whenever a pilot is scheduled to fly in excess of the flight time limits prescribed in Table A of part 117, when three or more pilots are assigned to the flight, or when the flightcrew member FDP limit is based on the limits of Table C of part 117. When augmentation is applied, the airplane must have an installed rest facility that is qualified as meeting one of the three classifications defined in § 117.3.

2) Augmented FDP Limits. Table C of part 117 prescribes the maximum FDP limits for a flightcrew member based upon the scheduled time of start of the FDP, the class of rest facility used and the number of flightcrew members assigned to that flight or series of flights (see Figure 3-163).

3) Augmented Flightcrew Member Flight Time Limits. Flight time limits for augmented flightcrew member FDPs consisting of 3 or 4 pilots are prescribed in § 117.11(a)(2)(3), which are 13 hours for 3 pilots and 17 hours for 4 pilots.

4) Constrained FDPs. FDP limits are reduced consistently based upon the schedule time of start of the FDP, the number of pilots assigned to the flight (or series of flights), and the class of rest facility used. While the maximum flight time limit for 4 pilots is 17 hours, the FDP limits for 4 pilots using a Class 3 rest facility constrains the maximum flight time limit to a lower limit. With exception of an FDP start time between 0700 and 1259, the FDP limits using a Class 2 rest facility also constrain the flight time limits for 4 pilots below the maximum flight time limit.

5) Benefits of Augmentation. The main benefit for augmentation is fatigue mitigation. However, due to operational necessity, if the certificate holder required a higher FDP or flight time limit for a flight or series of flights above the unaugmented limits, the use of augmentation may achieve the certificate holder's needs. If augmentation were used, the maximum applicable augmented FDP limits based upon the FDP start time, number of pilots assigned, and rest facility used would apply, along with the applicable flight time limit for either a 3- or 4-pilot assignment, keeping in mind the FDP limit may constrain the maximum flight time limit.

6) Limits on Augmentation. A flightcrew member is limited to a maximum of three segments while conducting an augmented FDP.

7) Limitations on a Diversion. A flight segment contains a takeoff and landing. If a takeoff results in a diversion, that flight segment (segment containing the diversion) will not be treated as a segment for the purpose of calculating the maximum 3-segment limitation for augmented FDP. While a diversion may not count as a flight segment, the time spent on diversion would still count for purposes of the FDP and flight time limits. This is because the flight-time limit applies to all time that is spent piloting an aircraft and the FDP limit applies to all time between when a pilot first reports for duty with the intention of flying a plane and when the pilot completes his/her final flight segment. Likewise, when determining the flightcrew member's maximum applicable FDP limit for unaugmented operations, a flight segment that results in a diversion is not considered part of the total segments during that FDP.

B. Conditions and Limitations on the Landing and Monitoring Flightcrew Members. The following conditions and limitations apply to the landing and monitoring flightcrew members operating on an augmented FDP:

- 1) Two consecutive-hours in the second half of the flight duty period are available for in-flight rest for the pilot flying the aircraft during landing.
- 2) Ninety consecutive-minutes are available for in-flight rest for the pilot performing monitoring duties during landing.

C. Cumulative Flight Duty Period Limits. Cumulative flight duty period hours are limited to any 168 consecutive-hours (seven consecutive-day-period) or any 672 consecutive-hours (four consecutive-week-period). No certificate holder may schedule and no flightcrew member may accept an assignment if the flightcrew member's total FDP hours will exceed:

- 60 FDP-hours in any 168 consecutive-hours, or
- 190 FDP-hours in any 672 consecutive-hours.

3-4702 FLIGHT DUTY PERIOD: SPLIT-DUTY (§ 117.15). The FAA defines the term "split-duty" as a FDP having a scheduled break in duty that is less than a required rest period. However, the scheduled break in duty does not provide the flightcrew member with a minimum of 10 consecutive-hours of rest required prior to beginning an FDP or reserve period. Split-duty is an effective fatigue mitigation that is based on the premise that there are times during an unaugmented nighttime FDP when a certificate holder could reasonably provide a flightcrew member with an opportunity for rest. This rest opportunity (opportunity to sleep) would allow a flightcrew member to get some sleep during the night. The nighttime sleep could be used to mitigate the performance degradation created by working through the WOCL.

A. Minimum Split-Duty Rest. Split-duty rest breaks provide carriers conducting nighttime operations with additional flexibility. Split-duty rest must be at least 3 hours long and must be scheduled in advance. The actual split-duty rest breaks may not be shorter than the scheduled split-duty rest breaks. The rationale for this is that flightcrew members must, at the beginning of their FDP, evaluate their ability to safely complete their entire assigned FDP. In order to do so, they must not only know the length of the FDP, but any scheduled split-duty rest breaks that they will receive during their FDP.

B. Unaugmented Operations Only. Split-duty may only be applied to an unaugmented flightcrew member; therefore, an augmented flightcrew may not receive any split-duty rest credit under the provisions prescribed in § 117.15.

C. Suitable Accommodation. The split-duty rest must occur in a suitable accommodation during his or her FDP. The time that the flightcrew member spends in the suitable accommodation is not considered part of that flightcrew member's FDP if all of the following conditions are met:

- 1) The rest opportunity is provided between the hours of 2200 and 0500 local time.
- 2) The time spent in the suitable accommodation is at least 3 hours, measured from the time that the flightcrew member reaches the suitable accommodation.
- 3) The rest opportunity is scheduled before the beginning of the flightcrew member's FDP in which that rest opportunity is taken.
- 4) The rest opportunity that the flightcrew member is actually provided may not be less than the rest opportunity that was scheduled.
- 5) The split-duty rest opportunity may not be provided until the flightcrew member's first segment of that FDP has been completed.
- 6) The combined time of the FDP and the split-duty rest opportunity may not exceed 14 hours.

NOTE: If the combined split-duty rest opportunity and FDP time of a flightcrew member exceeds 14 hours, then the amount of split-duty rest that caused the exceedance would not count as split-duty. Instead, this time would simply count as part of the flightcrew member's FDP, and it would be subject to the FDP extensions specified in § 117.19.

D. Scheduled vs. Actual Split-Duty Rest Break. Subsection 117.15(d) states that the actual split-duty rest opportunity may not be less than the scheduled split-duty rest opportunity. However, § 117.15 does not prohibit actual split-duty rest from exceeding the scheduled split-duty rest. If the actual split-duty rest period exceeds the scheduled rest period, then the actual rest provided to the flightcrew member would be considered split-duty as long as that rest period is within the 14-hour limit specified in § 117.15(f).

E. Application of Local Time for Split-Duty Rest. Subsection 117.15(a) states that the split-duty rest opportunity must be "provided between the hours of 2200 and 0500 local time." Thus, in order to determine compliance with § 117.15(a), the certificate holder must use local time at the location where the split-duty rest is being provided regardless of whether the flightcrew member is acclimated to the theater that encompasses that location.

3-4703 RESERVE STATUS (§ 117.21).

A. Reserve Flightcrew Member. A reserve flightcrew member is a flightcrew member who a certificate holder requires to be available to receive an assignment for duty.

B. Reserve Status. A flightcrew member assigned to a reserve period is considered to be in one of the following three reserve classifications (Status):

- 1) Airport/standby,
- 2) Short-call, or
- 3) Long-call.

C. Reserve Limitations. Unless the certificate holder specifically designates a flightcrew member assigned to a reserve period as being airport/standby or short-call reserve, then that flightcrew member is considered to be on long-call reserve; and must comply with the provisions prescribed for this classification of reserve.

D. Airport/Standby Reserve. Any reserve that meets the definition of airport/standby reserve must be designated as airport/standby reserve. The definition of airport/standby reserve may be found in § 117.3. For airport/standby reserve, all time that is spent on airport/standby reserve is part of a flightcrew member's FDP regardless of what happens during the airport/standby reserve. Therefore, the flightcrew member must be assigned in accordance with the applicable FDP limitations prescribed in Tables B or C (as applicable) of part 117.

E. Cumulative Limitations. Since all time spent in an airport/standby reserve status is part of the flightcrew member's FDP time, that time spent on Airport/standby is subject to the cumulative FDP limitations specified in § 117.21(b).

F. Physical Location of an Airport/Standby Assignment. Section 117.3 defines airport/standby reserve as a duty period during which a flightcrew member is required by a certificate holder to be at an airport for a possible assignment. In order to be at an airport, a flightcrew member would have to be physically located on airport property.

G. Short-Call Reserve. A flightcrew member assigned to short-call will have a reserve availability period (RAP) identifying the timeframe in which that flightcrew member must be available to the certificate holder. The flightcrew member's RAP may not exceed 14 hours.

H. Short-Call Rest Limitations. Once a flightcrew member completes a RAP, the flightcrew member must receive the required rest specified in § 117.25(e) prior to the certificate holder scheduling, and the flightcrew member accepting, an assignment for another RAP.

I. FDP and RAP Limitations for Unaugmented Operations. The total number of hours a flightcrew member may spend in an FDP and a RAP may not exceed the lesser of the maximum applicable FDP limit in Table B of part 117 plus 4 hours, or 16 hours, as measured from the beginning of the RAP. Essentially, the combined number of hours spent in a RAP and FDP may not exceed the lesser of: pertinent FDP limit in Table B plus four hours or 16 hours.

J. FDP Limits and the Addition/Subtraction of Flight Segments for Unaugmented Operations. The number of flight segments in an FDP can be changed after an FDP begins. However, as flight segments are added to a flightcrew member's FDP, the potential outcome may be a decreased FDP limit. Conversely, if the number of flight segments in an FDP is reduced, the FDP limit may be slightly increased up to the maximum limit. For the purposes of determining maximum applicable FDP limits, in the event a flight segment results in a diversion, the diversion segment does not count as a segment.

K. FDP and RAP Limitations for Augmented Operations. The total number of hours a flightcrew member may spend in an FDP and a RAP may not exceed the maximum applicable FDP limit in Table C of part 117 plus 4 hours, as measured from the beginning of the RAP. The combined number of hours spent in a RAP and an FDP may not exceed the pertinent FDP limit in Table C plus 4 hours.

L. FDP and RAP Limitations Apply to the Individual Flightcrew Member. The RAP and RAP + FDP limits, as well as the other limits in § 117.21, apply to each flightcrew member individually.

M. Example for Applying FDP and RAP Limits (Unaugmented Operations). An acclimated flightcrew member begins a RAP at 0600. That flightcrew member is then assigned to an unaugmented FDP that begins at 1200 and consists of two flight segments. According to Table B, the FDP limit for a two-segment FDP that begins at 1200 is 13 hours. The applicable 13-hour FDP limit plus 4 hours equals 17 hours. Because this is greater than 16 hours, under § 117.21(c)(3), the pertinent RAP + FDP limit for this unaugmented operation is 16 hours. Given that the flightcrew member in this example began his RAP at 0600, he will have 6 hours of RAP time by the time his FDP will start at 1200. As a result, to stay within the 16-hour RAP + FDP limit, this flightcrew member's FDP cannot exceed 10 hours without an extension, as his RAP will use up 6 hours of the 16-hour RAP + FDP limit. For the second example, an acclimated flightcrew member begins a RAP at 1100. That flightcrew member is then assigned to an unaugmented FDP consisting of five flight segments that begin at 1500. According to Table B, the FDP limit for a five-segment FDP that begins at 1500 is 11.5 hours. The applicable 11.5-hour FDP limit plus 4 hours equals 15.5 hours. Because this is smaller than 16 hours, under § 117.21(c)(3), the pertinent FDP + RAP limit for this unaugmented operation is 15.5 hours. Since the flightcrew member in this example began his RAP at 1100, he will have 4 hours of RAP time by the time his FDP will start at 1500. Consequently, this flightcrew member can take the full 11.5-hour FDP as the 11.5-hour FDP plus the 4 hours of RAP will not exceed the 15.5-hour RAP + FDP limit.

N. Entering the FDP Table While on a RAP. The pertinent FDP limit for the RAP + FDP regulations in § 117.21 is determined using the time at which the FDP begins.

O. Reserve and Cumulative Limitations. Short-call reserve consists of a RAP and an FDP, if the FDP is assigned during the reserve. The RAP is not part of an FDP, and as such, the time spent on an FDP is the only aspect of short-call reserve that is counted toward the cumulative FDP limits. However, this situation would change if the pilot was to be assigned to airport/standby reserve instead of short-call reserve. Under § 117.21(b), the entire time that is spent in airport/standby reserve is considered to be FDP.

P. Long-Call Reserve Rest Requirements. A flightcrew member assigned to long-call reserve must receive the rest specified in § 117.25(e). However, if a certificate holder contacts a flightcrew member to assign him or her to an FDP that will begin before and operate into the flightcrew member's WOCL, the flightcrew member must receive a 12-hour notice of report time from the certificate holder.

Q. Shifting a Flightcrew Member from Long-Call to Short-Call Reserve. A certificate holder may shift a reserve flightcrew member's reserve status from long-call to short-call only if the flightcrew member receives a rest period as provided in § 117.25(e).

3-4704 REST PERIODS (§ 117.25). A certificate holder may not assign, nor may a flightcrew member accept, an assignment to any reserve or duty with that certificate holder during any required rest period. A rest period must be prospective in nature, which means that a flightcrew member must be told in advance that he or she will be on a rest period for a specified duration. This is so that a flightcrew member has an opportunity to plan out his or her rest period in order to maximize the sleep opportunities available during that rest period.

A. Minimum 10-Hour Rest Period. Part 117 prescribes the minimum rest period between FDPs as 10 consecutive hours measured from the time the flightcrew member is released from duty. This 10-hour rest period must provide the flightcrew member with a minimum 8 uninterrupted hours of sleep opportunity. Subsection 117.25(e) requires the 10 hours of rest period (that includes an 8-hour uninterrupted sleep opportunity) to occur immediately before the flightcrew member begins a reserve period or FDP. This is to ensure the flightcrew member is properly rested prior to accepting an assignment for reserve or an FDP. If, however, the flightcrew member determines that their 10-hour rest period will not provide 8 uninterrupted hours of sleep opportunity, the flightcrew member must notify the certificate holder. The flightcrew member cannot report for the assigned reserve period or FDP until that flightcrew member receives an 8-hour sleep opportunity.

B. Thirty-Hour Cumulative Rest Period. In an effort to mitigate cumulative fatigue, a flightcrew member must receive a 30 consecutive hour rest period within the previous 168 consecutive hours. Therefore, before beginning any reserve or FDP, a flightcrew member must be given at least 30 consecutive hours free from all duty in any 168 consecutive hours. The point of reference for the 168-hour rest period specified in § 117.25(b) is the beginning of an FDP. In this case § 117.25(b) requires that a flightcrew member be provided with a 30 consecutive hour rest period in the 168-hour period immediately preceding an FDP. In the event a flightcrew member has received 36 consecutive hours of rest to re-acclimate to a new theater, the flightcrew member is considered to have met the 30 consecutive hour cumulative rest requirement. Again, the flightcrew member's assigned rest period must be prospective in nature. Because a flightcrew member would need to plan ahead in order to maximize the multiple sleep opportunities available during this 30-hour rest period, the flightcrew member must be told before the rest period begins that he/she will be receiving 30 hours of rest in order for that rest to satisfy § 117.25(b).

C. Acclimation. A flightcrew member operating in a new theater that has received 36 consecutive hours of rest, or who has been in a new theater for 72 hours, is considered to be acclimated to that new theater.

D. Rest Requirements After Being Out of Theater and Away From Home Base for More Than 168 Hours. If a flightcrew member travels more than 60° longitude during an FDP, or a series of FDPs, that require him or her to be away from home base for more than 168 consecutive hours, the flightcrew member must be given a minimum of 56 consecutive hours rest upon return to home base. This required rest must encompass three physiological nights' rest based on local time.

E. Rest Requirements for Deadhead Transportation. If a flightcrew member engaged in deadhead transportation exceeds the applicable FDP in Table B of part 117, the flightcrew member must be given a rest period equal to the length of the deadhead transportation but not less than 10 consecutive hours immediately before beginning an FDP measured from the time the flightcrew member is released from duty. For the purpose of clarity, in accordance with the definition of FDP in § 117.3, deadhead transportation that is followed by a flight segment without an intervening rest period is part of an FDP and is subject to the FDP limits in Tables B and C. All other deadhead transportation is not part of an FDP and is not subject to any limits under part 117. However, if the deadhead transportation exceeds the limits of Table B, § 117.25(g) requires that the flightcrew member engaging in the deadhead transportation be provided with a compensatory rest period before beginning his/her next FDP.

3-4705 CONSECUTIVE NIGHTTIME OPERATIONS (§ 117.27). The provisions prescribed in § 117.27 for consecutive nighttime operations apply whenever a flightcrew member's FDP infringes on any part of that flightcrew member's WOCL. If, however, a flightcrew member's FDP remains entirely free of their WOCL, the provisions of § 117.27 would not be applicable. When a flightcrew member conducts operations during their WOCL, the risk of cumulative fatigue significantly increases. For this reason § 117.27 prescribes specific limitations and conditions when consecutive nighttime operations apply, regardless of whether the FDP is unaugmented or augmented.

A. Limitations for Consecutive Nighttime Operations. Flightcrew members are limited to a maximum of 3 consecutive nighttime FDPs without any additional mitigation. However, a flightcrew member may be assigned a maximum of 5 consecutive nighttime FDPs provided the certificate holder provides that flightcrew member with a minimum 2-hour mid-duty rest opportunity during each of the 5 consecutive nighttime FDPs. This rest period must be taken in a suitable accommodation (as defined in § 117.3), and the minimum 2-hour mid-duty rest opportunity is measured from the time that flightcrew member reaches the suitable accommodation.

B. Infringement on the Flightcrew Member's WOCL. As a point of reference, in a series of consecutive FDPs, the flightcrew member's first FDP that infringes on their WOCL is subject to the limitations prescribed in consecutive nighttime operations. A flightcrew member may not exceed three consecutive nighttime operations without specific mitigations prescribed in § 117.27. This simply means that a flightcrew member may not be scheduled, or accept an assignment, for more than three consecutive nighttime FDPs where each of the three FDPs infringe on any part of that flightcrew member's WOCL.

C. Limitations on Five Consecutive Nighttime FDPs. A certificate holder may schedule, and a flightcrew member may accept, up to five consecutive FDPs if that certificate

holder provides that flightcrew member with an opportunity to rest in a suitable accommodation during each of the consecutive nighttime FDPs. The criteria for the suitable accommodation must meet the definition outlined in § 117.3. Principally, a flightcrew member may be scheduled and may accept up to 5 consecutive nighttime operations provided the certificate holder provides that flightcrew member with a minimum of a 2-hour rest opportunity during each of the consecutive nighttime FDPs. When a flightcrew member is scheduled 4 or 5 consecutive nighttime FDPs, that flightcrew member must be provided at least a 2-hour rest opportunity during each of the 4 or 5 FDPs, as applicable. Otherwise, that flightcrew member is limited to three consecutive nighttime FDPs.

D. Two-Hour Rest Opportunity Conditions and Limitations. The minimum 2-hour rest opportunity is measured from the time that flightcrew member reaches the suitable accommodation. The following limitations and conditions shall apply to each 2-hour mid-duty rest opportunity:

- 1) The rest opportunity is provided between the hours of 2200 and 0500 local time.
- 2) The rest opportunity is scheduled before the beginning of the FDP in which that rest opportunity is taken.
- 3) The rest opportunity that the flightcrew member is actually provided may not be less than the rest opportunity that was scheduled.
- 4) The rest opportunity is not provided until the first flight segment of the FDP has been completed.

3-4706 EMERGENCY AND GOVERNMENT-SPONSORED OPERATIONS (§ 117.29).

Flights operated by a certificate holder under contract with a U.S. Government agency must comply with the flight and duty regulations in part 121 and 14 CFR part 135, as appropriate, unless the Administrator has granted a deviation under 14 CFR part 119, §§ 119.55 or 119.57. This section addresses various supplemental operations that require flying into or out of hostile areas, and politically sensitive, remote areas that do not have rest facilities. This authority is issued on a case-by-case basis during an emergency situation as determined by the Administrator. These operations range from moving armed troops for the U.S. military, conducting humanitarian relief, repatriation, Air Mobility Command (AMC), and State Department missions.

A. Application of Emergency and Government-Sponsored Operations. The purpose of this section is to address true emergency situations and operations that are being conducted under contract with the U.S. Government that pose exceptional circumstances that would otherwise prevent a flightcrew member from being relieved from duty or safely provided with rest at the end of the FDP. This section is not meant to address self-induced emergencies that arise from inadequate planning. Certificate holders must be responsible for having appropriate onboard rest facilities or the proper number of flightcrew members available for the length of the duty day, if necessary.

B. PIC Limited Authority to Extend an FDP. The PIC may determine that maximum applicable FDPs must be exceeded to the extent necessary to allow the flightcrew to fly to the

closest destination where they can safely be relieved from duty by another flightcrew or can receive the requisite amount of rest prior to commencing their next FDP.

C. Prohibition on Exceeding Cumulative Limitations. An FDP may not be extended for an operation conducted pursuant to a contract with the U.S. Government if it causes a flightcrew member to exceed the cumulative flight time limits in § 117.23(b) and the cumulative FDP limits in § 117.23(c).

D. Required Rest. The flightcrew shall be given a rest period immediately after reaching the destination equal to the length of the actual FDP or 24 hours, whichever is less.

E. Reporting FDP Extensions Under This Section. Each certificate holder must report to the FAA within 10 days:

1) Any FDP that exceeded the maximum FDP permitted in Tables B or C of part 117, as applicable, by more than 30 minutes; and

2) Any flight time that exceeded the maximum flight time limits permitted in Table A of part 117 and § 117.11, as applicable.

F. Contents of the FDP Extension Report. The report must contain the following:

1) A description of the extended FDP and flight time limitation, and the circumstances surrounding the need for the extension; and

2) If the circumstances giving rise to the extension(s) were within the certificate holder's control, the corrective action(s) that the certificate holder intends to take to minimize the need for future extensions.

G. Implementation of Corrective Actions. Each certificate holder must implement the corrective action(s) reported in the FDP extension report within 30 days from the date of the extended FDP.

RESERVED. Paragraphs 3-4707 through 3-4748.

Section 3 Guidance Evaluation and Qualification of Onboard Flightcrew Member Rest Facilities for Part 117 Operations

3-4722 GENERAL. This section provides the inspector with the necessary guidance to evaluate and qualify a certificate holder's onboard flightcrew member rest facilities as meeting the specifications and criteria of a Class 1, 2, or 3 facility.

3-4723 BACKGROUND. Under Title 14 Code of Federal Regulations (14 CFR) part 121, §§ 121.485(a) and 121.523(b), if a flightcrew member is scheduled to fly more than 12 hours during any 24-consecutive hour period, the certificate holder must provide the flightcrew member with "adequate" sleeping quarters. The criteria for adequate sleeping quarters may be found in Advisory Circular (AC) 121-31, Flight Crew Sleeping Quarters and Rest Facilities. Additionally, the Federal Aviation Administration (FAA) has issued legal interpretations defining the meaning of adequate sleeping quarters (see letter to Mr. Wells dated 9/22/03) in which the FAA stated, "Generally, an adequate rest facility means a bunk or berth." However, the industry has loosely interpreted the meaning of a rest facility, which has resulted in a wide variation of sleeping quarters.

NOTE: It is important to note that the purpose of a rest facility is to provide a suitable area for flightcrew members to rest during long-haul operations while operating in an augmented crew configuration.

A. Title 14 CFR Part 117. On January 4, 2012, the FAA published (final rule) 14 CFR part 117, Flightcrew Member Flight and Duty Time Limitations and Rest Requirements. Part 117 prescribes many limitations supporting fatigue mitigation that are based on current fatigue science. Part 117 established three classes of onboard flightcrew member rest facilities. The minimum criteria required for a rest facility to be qualified as meeting either a Class 1, 2, or 3 designation is defined in § 117.3 and outlined in AC 117-1, Flightcrew Member Rest Facilities.

B. Qualification. Qualification of an onboard rest facility is an essential function for determining whether a particular rest facility meets the criteria of one of the three classes. Once the FAA qualifies that rest facility as meeting one of the three classifications prescribed in part 117, the classification for that specific airplane will remain in effect until the rest facility is modified or the FAA determines it no longer meets its previously qualified status. Ensuring that a rest facility meets and is maintained to its qualified classification is crucial as the class of rest facility used is one of the three elements required to determine a flightcrew member's maximum flight duty period (FDP) limit for augmented operations.

3-4724 DIFFERENCES BETWEEN A REST FACILITY AND A SUITABLE ACCOMMODATION. In an effort to eliminate confusion between the terms rest facility and a suitable accommodation, part 117 defines a rest facility as a bunk or seat accommodation installed in an airplane that provides a flightcrew member with sleep opportunity.

A. Suitable Accommodation. A suitable accommodation means a temperature-controlled facility with sound mitigation, the ability to control light and provides a flightcrew member with the ability to sleep either in a bed, bunk, or in a chair that allows for a

flat or near flat sleeping position. Suitable accommodation only applies to ground facilities and does not apply to airplane onboard rest facilities.

B. Classification of Rest Facilities. Each classification of a rest facility is designed to provide a minimum sleep quality based upon its classification. A Class 1 facility provides good sleep, a Class 2 provides fair sleep, and a Class 3 provides poor sleep quality. The better the quality of sleep the longer the flightcrew member's maximum FDP limit. Conversely, the lesser the sleep quality, the shorter the flightcrew member's FDP limit. Part 117, § 117.3 defines the classification of each onboard flightcrew member rest facility based upon the following physical characteristics, specifications, and design criteria:

1) Class 1 rest facility means a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flightcrew member to control light, and provides isolation from noise and disturbance.

2) Class 2 rest facility means a seat in an airplane cabin that allows for a flat or near flat sleeping position, is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or flightcrew members.

3) Class 3 rest facility means a seat in an airplane cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

3-4725 TNO REPORT. During the development of part 117, with regard to what constitutes each specific type of rest facility, the FAA took note of a comprehensive evaluation of available onboard rest facilities (refer to pages 343-345 of the part 117 preamble), which was conducted by the Dutch government in 2007 (Simons M., Spencer M., Extension of Flying Duty Period by In-Flight Relief Report TNO–DV2007C362. TNO, Soesterberg, Netherlands, 2007 (TNO Report)). The TNO Report was created in order to provide science-based advice on the maximum permissible extension of the FDP related to the quality of the available onboard rest facility and the augmentation of the flightcrew with one or two pilots. As such, the FAA relied heavily on the data contained in the TNO report.

3-4726 FDP LIMITS.

A. Relationship Between Rest Facility Qualification and Augmented FDP Limits. The FDP limits for augmented operations may be found in Table C of part 117 and are reflected in Figure 3-163, Table C to Part 117 – Flight Duty Period: Augmented Operations (see Volume 3, Chapter 58, Section 2.) In determining the flightcrew member's maximum FDP limits, the FAA took note of the recommendations set out in the TNO Report. The TNO Report recommended that:

1) An airplane with a Class 1 rest facility provides an FDP extension equal to 75 percent of the duration of the rest period,

2) An airplane with a Class 2 rest facility provides an FDP extension equal to 56 percent of the duration of the rest period, and

3) An airplane with a Class 3 rest facility provides an FDP extension equal to 25 percent of the duration of the rest period.

NOTE: The augmented FDP limits in Table C of part 117 (see Figure 3-163) are based on the quality of rest opportunity that would be provided the flightcrew member while in the rest facility.

B. Difference Between Maximum FDP Limits and Maximum Applicable FDP

Limits. FDP limits apply to the individual flightcrew member. For the purpose of augmented flightcrew member operations, Table C of part 117 (see Figure 3-163) prescribes a flightcrew member's maximum FDP limits based upon the class of rest facility used, the number of pilots assigned, and the flightcrew member's scheduled time of start. The table assumes the flightcrew member is acclimated; however, if the flightcrew member is not acclimated their maximum FDP limit must be reduced by 30 minutes. The term "maximum applicable FDP limit" illustrates the flightcrew member's maximum FDP limits based upon the class of rest facility, number of pilots assigned, scheduled time of start and whether the flightcrew member is acclimated.

3-4727 REST FACILITIES.

A. Physical Location of the Rest Facility. The certificate holder must consider many factors when determining the location of an onboard rest facility. Such factors include isolation from disturbance by passengers and other crewmembers, environmental noise, and the location of the rest facility with respect to the serving carts and around the galley areas. Rest facilities should not be located in the economy-class section of the airplane. One of the reasons why an economy-class seat does not provide restful sleep is that space around the seat is not sufficient to create an adequate separation from the passengers (economy jostling). Because there are substantially more passengers in the economy section of an airplane, that section is generally noisier and have more densely-packed people than the other sections of the airplane. In addition, the FAA notes that economy cabins are generally located behind the airplane engines, and thus, have to deal with louder engine noise. Due to all of these considerations, locating a rest facility in the economy section would reduce the restfulness of the sleep obtained by a flightcrew member.

B. Prohibition on the Use of an Economy-Class Passenger Seat as a Rest Facility. The decision to not consider an economy-class seat as a rest facility was based on the TNO Report (refer to pages 343-345 of the preamble to part 117), which determined that "the probability of obtaining recuperative sleep in such a seat would be minimal" on the following considerations:

- 1) An economy-class seat does not recline more than 40 degrees "and has no opportunities for adequate foot and leg rest, which diminishes the probability of recuperative sleep,"
- 2) "Space around the seat is not sufficient to create an adequate separation from the passengers (jostle in economy class), or guarantee any privacy," and
- 3) "A majority of passengers are unable to sleep at all in an economy seat."

NOTE: In developing part 117, the FAA agreed with the TNO Report's analysis of economy-class passenger seats and based on this analysis, which states that economy-class seats provide minimal amounts of recuperative sleep, the FAA has determined that economy-class seats should not be considered as a rest facility for the purposes of part 117. To that end, the FAA will not accept an economy-class seat as a rest facility because the TNO Report has determined that these types of seats provide a minimal amount of restful sleep.

C. Relationship Between Rest Facility and Sleep Surface. A sleep surface is the fundamental part of the rest facility and may be a bed, bunk, or a seat based upon the classification of rest facility. Each class of rest facility has physical specifications relative to that specific classification.

D. When a Rest Facility is Required. A rest facility is required any time the flightcrew is augmented. The rest facility used must meet one of the three classifications outlined in § 117.3.

3-4728 DEFINITIONS.

A. Applying Augmentation. The primary purpose of augmentation is to provide the operating flightcrew members with in-flight rest relief. However, in-flight rest may not be the only reason for the application of augmentation. A certificate holder may augment the minimum required flightcrew because their planned FDP and/or flight time may exceed their maximum applicable FDP and/or flight time limits prescribed for unaugmented operations. For example, an unaugmented flightcrew is assigned an FDP starting at 0700 hour; with 5 planned segments during that FDP, the flightcrew member's maximum applicable FDP limit would be 12.5 hours (see Figure 3-162, Table B to Part 117 – Flight Duty Period: Unaugmented Operations (Volume 3, Chapter 58, Section 2)). Due to operational necessity, the planned FDP requires 13.5 hours.

1) The certificate holder has a few potential options available. First, they could potentially extend the flightcrew member's FDP with pilot in command (PIC) concurrence. However, if the option of an extension is not available, the certificate holder could reduce the number of segments during that FDP to two segments (14-hour FDP limit) or plan to augment that FDP. Applying the augmentation FDP limits (see Figure 3-163), a flightcrew consisting of three pilots with a scheduled time of start of 0700, and using a Class 3 rest facility, the flightcrew member's maximum applicable FDP limit would now be 15 hours. A similar approach can be applied to flight time limits. Considering the same scheduled time of start in an unaugmented operation, the planned flight time may exceed 9 hours. In this case, by using augmentation (three pilots), the flightcrew would have a new flight time limit of 13 hours during that augmented FDP.

2) Flightcrew members serving in an augmented crew are considered to be in excess of the minimum required flightcrew member complement. Because the entire flightcrew would consist of 3 or 4 pilots, their maximum applicable FDP limit would be determined by use of Table C of part 117 (see Figure 3-163). Table C of part 117 prescribes the flightcrew member's FDP limits based upon three criteria: the FDP scheduled time of start, the number of pilots

assigned to the FDP, and the classification of rest facility being used. Flight time limits for 3 and 4-pilot crews are prescribed in § 117.11(a)(2)(3), which are 13 and 17 hours, respectively.

B. Evaluation and Qualification Inspection. An evaluation and qualification inspection is a two-step process performed by the principal operations inspector (POI) (or the Aircraft Evaluation Group (AEG) for Class 1 rest facilities). The purpose of the inspection is to ensure the rest facility and sleep surface conforms to its design and operational criteria and conforms to the limitations and specifications prescribed in § 117.3. The first step is to review the data contained in the certificate holder's technical report for the rest facility being qualified. The second step is to perform a qualification inspection using the appropriate Qualification Analysis Statement (QAS) (See Figure 3-191, Qualification Analysis Statement Class 1 Rest Facility; Figure 3-192, Qualification Analysis Statement Class 2 Rest Facility; and Figure 3-193, Qualification Analysis Statement Class 3 Rest Facility).

C. Technical Report. The certificate holder will prepare a technical report pertinent to the class of rest facility being qualified explaining how the rest facility complies with part 117 and the guidance in AC 117-1. The purpose of the technical report is to provide the POI or AEG with the necessary supporting documentation for qualification of the rest facility. The technical report must identify the installation approval source for the specific class of rest facility being qualified. The installation approval source may be from the airplane's type certificate (TC) and reflected in the Type Certificate Data Sheet (TCDS), a Supplemental Type Certificate (STC) or a Designated Engineering Representative (DER) approval. In the event the Flight Standardization Board (FSB) Report for that airplane type includes and identifies a specific rest facility that meets the criteria prescribed in § 117.3 for a specific class of rest facility, this data may be used as a substitute for the installation approval source provided the rest facility is identical to class included in the FSB.

1) The technical report must contain a complete list of the certificate holder's airplanes (by registration and serial number, make, model and series (M/M/S)) that correspond to the installation approval for the specific class of rest facility being qualified. The technical report is instrumental in providing relevant data applicable to the all the rest facilities installed under a particular installation approval. Absence of this data will result in the FAA evaluating each rest facility separately.

2) When the certificate holder is prepared to have their rest facilities qualified they will make this request through their POI. With this notification, the certificate holder should provide their POI with a copy of a technical report. It is important for the certificate holder to recognize that a more organized and complete technical report will result in a smoother evaluation and qualification. The technical report should contain the following data:

a) A list of airplanes, by registration number, serial number, M/M/S, classification of rest facility to be qualified, and the number of sleep surfaces installed under that classification.

b) The method for approval of the rest facility installation such as TC, STC, DER approval or another acceptable means of approval. If applicable, a statement from the FSB stating the rest facility meets the criteria prescribed in § 117.3.

- c) Specific dimensions and layout of the rest facility and sleep surface (photographs, drawings, diagrams, etc.) and its location on the airplane.
- d) Operating instructions pertinent to the operation and use of the sleep surface and rest facility.
- e) Design features for the specific rest facility class qualification.
- f) Sound mitigation data for Class 1 rest facilities.
- g) Sound mitigation data and operating procedures applicable to curtain installed for a Class 2 rest facility.
- h) Any other appropriate approved data supporting the proposed qualification of rest facility.
- i) If applicable, a differences table identifying the differences associated with the class of rest facility under this installation approval.
- j) Augmented operations procedures.
- k) In the event the design of the rest facility requires some preparation by the crew prior to use, such as expanding sections, the evaluation request should include appropriate preparation procedures, and recommended qualification/training requirements (if required).

D. Differences Table. In any class of rest facilities under the same installation approval source, the design, location and layout should be identical. However, in the event differences exist in a class of rest facility under the same installation, the certificate holder should identify those differences and incorporate them into a differences table. The table should be included in the certificate holder's technical report.

E. QAS. There are three QAS documents, one document applicable for each classification of rest facility. Each QAS (Class 1, 2 or 3) document contains a checklist of items applicable to that classification of rest facility. When evaluating and qualifying a rest facility, the inspector (or AEG) must use the appropriate QAS for the classification being conducted.

F. Completing the QAS. Prior to completing, the POI or AEG should review the data within the certificate holder's technical report that outlines the design criteria and specifications for the class of rest facility being qualified. This data should outline the information supporting the class of rest facility to be qualified. The QAS should be completed in the following manner:

- 1) **Certificate Holder:** Enter the name of the certificate holder.
- 2) **Certificate No.:** Enter the certificate holder's air carrier certificate number.
- 3) **TC/STC/DER Approval:** For Class 1 rest facilities qualification only, in the installation approval is under the airplane TC, enter the TC number. For all classes of rest

facilities where the installation approval is under a STC or DER approval, enter the STC or DER approval for that class of rest facility.

- 4) **M/M/S:** Enter the airplane M/M/S.
- 5) **Registration No.:** Enter the airplane registration number.
- 6) **Serial No.:** Enter the serial number of the airplane.

7) **Number of Sleep Surfaces:** Enter the number of sleep surfaces installed in the airplane under the classification for which the rest facility is qualified.

G. Operation Specification (OpSpec) A117. OpSpec A117, Use of Onboard Flightcrew Member Rest Facilities, must be issued to the certificate holder prior to conducting augmented flightcrew member operations using the FDP limits prescribed in Table C of part 117. OpSpec A117 serves as the source document identifying each of the certificate holder's airplanes having installed rest facilities based upon the class of rest facility and the number of sleep surfaces under that classification. This data corresponds to the airplane (M/M/S, registration and serial number) listed in OpSpec A117.

H. Relationship Between the QAS and OpSpec A117. The completion of a QAS initiates the issuance of, or update to, the certificate holder's OpSpec A117. The POI will be responsible for the issuance of OpSpec A117 and, if applicable, the subsequent addition or deletion of the certificate holder's airplanes having rest facilities. At the conclusion of a satisfactory qualification of class 1 rest facility, once the AEG has completed the qualification evaluation and prepared the QAS, they will forward a copy to the POI.

NOTE: The certificate holder's technical report should contain a list of all their airplanes (by M/M/S) that have rest facilities under the same rest facility classification and installation approval. When preparing the certificate holder's OpSpec A117, the POI should have a copy of the technical report and the completed QAS. Refer to the technical report for a list of all the certificate holder's airplanes (by M/M/S and registration and serial number) that have the same installation approval and the same class of rest facility qualified by this QAS. Insert each of these airplanes by M/M/S, registration and serial number, class of rest facility, qualification date, and the number of sleep surfaces.

I. Augmented Operations Procedures. The certificate holder should develop augmented operations procedures relative to the use of the specific onboard rest facilities and sleep surface. The certificate holder should provide the POI (or AEG inspector) with a copy of their augmentation operating procedures. At a minimum, the certificate holder's augmented operations procedures should include the following:

- 1) Specific operating procedures relative to the operation of the rest facility and sleep surface for augmented flightcrew operations,
- 2) Use of Table C in part 117 to determine a flightcrew member's maximum applicable FDP limits,

- 3) Procedures for the loss of cabin altitude while in the rest facility,
- 4) Emergency communications procedures between the flight deck crew and the flightcrew member(s) in the rest facility,
- 5) Procedures for smoke in the cabin for flightcrew members in the rest facility, and
- 6) Procedures for dealing with fires in the rest facility.

3-4729 EVALUATION AND QUALIFICATION.

A. Paths for Evaluation and Qualification of Rest Facilities. Evaluation and qualification of onboard rest facilities will follow one of four paths:

- 1) Existing rest facilities (adequacy evaluated in accordance with AC 121-31),
- 2) Newly installed Class 1,
- 3) Newly installed Class 2 and 3, and
- 4) Previously qualified rest facilities (Class 1, 2, or 3 in accordance with the criteria established in part 117).

B. Responsibility for Evaluating and Qualifying a Rest Facility. The responsibility for evaluating and qualifying rest facilities is determined by the classification sought by the certificate holder.

1) Class 1 Rest Facilities. Due to the specification and design criteria of a Class 1 facility, the AEG having responsibility of that airplane type will conduct the evaluation and qualification. The AEG will keep the POI having oversight responsibility of that certificate holder involved throughout the process.

2) Class 2 and 3 Rest Facilities. The POI having oversight responsibility of that certificate holder will be responsible for conducting the evaluation and qualification of Class 2 and 3 rest facilities with the AEG serving in an advisory role. The AEG will serve in an advisory role to the POI.

C. The Qualification Process. The classification of the onboard rest facilities (i.e., Class 1, 2, and 3) is one of the three elements used to determine the augmented flightcrew member's maximum FDP limit. Therefore, it is imperative that the certificate holder's rest facilities are properly evaluated and qualified as meeting one of the classifications (Class 1, 2 or 3) prescribed in § 117.3 prior to using that airplane in augmented flightcrew member operations.

1) Early identification of the qualification project is essential for ensuring a timely rest facility evaluation. Requests for FAA qualification of the rest facility should be made in a timely manner so that an inspection and evaluation of the rest facility may be scheduled after the installation is complete for newly installed facilities, and for existing facilities. Therefore, the

certificate holder should submit their request for rest facility qualification to their POI as early as possible. If the qualification project is for a Class 1, the POI must forward this request to the AEG having responsibility for that airplane type.

2) Requests should also include a technical report (as described in this document) relative to the rest facility being qualified. In the event the design of the rest facility requires some preparation by the crew prior to use, such as expanding sections, the evaluation request should include appropriate preparation procedures, and recommended qualification/training requirements (if applicable).

D. Installation Approval. The data contained in the installation approval specifies the design criteria, operational specifications and materials used along with the layout of the facility as well as its location on the airplane. Each class of rest facility installed under a specific approval should be identical to another under of that same approval. For this reason, when the certificate holder prepares their technical report they should list in the technical report each airplane with rest facilities (M/M/S, registration and serial number) corresponding to its installation approval source for that classification. Therefore, when evaluating a certificate holder's rest facility, the POI (or AEG) need only inspect one class of rest facility under that installation approval per airplane type. As an example, a certificate holder operates ten (10) Boeing B-767 airplanes, each having two (2) Class 2 rest facilities installed under the same installation approval and the layout is identical. Under this example only one of the certificate holder's ten (10) B-767's need to be evaluated as the remaining nine (9) B-767 airplanes will fall under this qualification. The certificate holder's technical report should reflect ten (10) B-767 (individually listed by registration and serial number, and M/M/S) under the same installation approval, each airplane having two (2) Class 2 rest facilities.

E. Rest Facility Differences. If differences exist in a particular class of rest facility under the same installation approval, these differences must be reflected in the certificate holder's technical report corresponding to the specific airplane by M/M/S and registration and serial number. Such differences include, but are not limited to, number of sleep surfaces, the sleep surface, sound mitigation data for Class 1 and 2 facilities, design and layout, location of the rest facility and airplane type. The certificate holder should develop a table outlining the rest facility differences applicable to the class of rest facility, the airplane type and the installation approval for that rest facility. The differences table should be incorporated into the certificate holder's technical report for that class of rest facility and airplane type. The differences table must be evaluated to determine if individual evaluations must be conducted for each of the rest facilities having those differences. If the differences are common to a given number of airplanes of the same type, then only one of those airplane's rest facilities with common differences needs to be evaluated. Otherwise, each airplane's rest facilities with differences must be evaluated individually.

F. Conducting the Rest Facility Evaluation and Qualification Inspection. When conducting a rest facility evaluation and qualification inspection:

1) For Class 1 rest facilities, the AEG will review the data in the certificate holder's technical report and supporting documentation to determine if it supports Class 1 criteria. Using the data in the technical report and conducting a physical inspection of the rest facility, the AEG

will complete the Class 1 QAS checklist. If the AEG determines that an item required for the Class 1 qualification does not meet the criteria, the AEG will notify the POI of the findings. The certificate holder will be advised by the POI that they have three options. They can make the necessary corrective actions and reschedule another inspection by the AEG, evaluate the rest facility to a lower class (i.e., Class 1 to a Class 2), or contact the Air Transportation Division, AFS-200, to pursue a Fatigue Risk Management System (FRMS) application. If the certificate holder elects to have the rest facility evaluated to a lower class, that evaluation responsibility rests with the POI. In this case the AEG would serve in an advisory role to the POI. If, however, the AEG qualifies the rest facility as a Class 1, the AEG will forward a copy of the completed Class 1 QAS to the POI.

2) For Class 2 rest facilities, the POI will review the data in the certificate holder's technical report and supporting documentation to determine it supports Class 2 criteria. Using the data in the technical report and conducting a physical inspection of the rest facility, the POI will complete the Class 2 QAS checklist. If the POI determines that an item required for the Class 2 qualification does not meet the criteria, the POI will advise the certificate holder that they have three options. They can make the necessary corrective actions and reschedule another inspection with the POI, evaluate the rest facility to a lower class (i.e., Class 2 to a Class 3), or contact AFS-200 to pursue an FRMS application. If the certificate holder elects to have the rest facility evaluated to a lower class, that evaluation responsibility rests with the POI. The AEG would serve in an advisory role to the POI, if necessary. If the POI determines the rest facility qualifies as a Class 2, the POI will complete the Class 2 QAS.

3) For Class 3 rest facilities, the POI will review the data in the certificate holder's technical report and supporting documentation to determine it supports Class 3 criteria. Using the data in the technical report and conducting a physical inspection of the rest facility, the POI will complete the Class 3 QAS checklist. If the POI determines that an item required for the Class 3 qualification does not meet the criteria, the POI will advise the certificate holder that they have two options. They can make the necessary corrective actions and reschedule another inspection with the POI, or contact AFS-200 to pursue an FRMS application. The AEG will serve in an advisory role to the POI, if necessary. If the POI determines that the rest facility qualifies as a Class 3, the POI will complete the Class 3 QAS.

G. Qualifying a Class 1 Rest Facility and Existing Rest Facilities (Adequacy Evaluated in Accordance with AC 121-31). If the request for qualification is for a Class 1 rest facility, the POI will forward that request to the AEG having responsibility for that airplane type. The certificate holder will provide the POI with the instructions for continued airworthiness (ICA), the technical report, approved data and other supporting data relative to the class of rest facility at the time of the qualification request. Along with this request, the POI will forward a copy of the technical report, approved data and other supporting documentation to the AEG. The AEG will coordinate with the POI throughout the evaluation. The AEG will coordinate with the certificate holder to schedule a time and location to conduct the evaluation. The AEG will conduct an evaluation and qualification to evaluate and inspect the rest facility for compliance with part 117. The qualification is accomplished by use of the Class 1 QAS checklist. If a question in the checklist yields a "NO" response, it means the rest facility is not qualified as a Class 1. Therefore, to be qualified as a Class 1 rest facility, each question in the Class 1 QAS must yield a "YES" response.

1) Once the rest facility has been qualified as meeting the criteria and specifications prescribed in part 117 for a Class 1, the AEG will issue a Class 1 QAS for that rest facility. Once issued, the AEG will forward a copy of the completed Class 1 QAS to the POI to initiate the issuance of OpSpec A117. The AEG will retain a copy of the completed Class 1 QAS.

2) The qualification will remain in effect until a modification to the rest facility or a component of the rest facility renders it noncompliant with the criteria and specifications prescribed in part 117 for that classification, or the FAA determines the rest facility no longer meets the criteria and specification(s) prescribed in part 117 for that classification.

H. Qualifying Class 2 and 3 Rest Facilities. Requests for FAA qualification of the rest facility should be made in a timely manner to the certificate holder's POI so that an inspection and evaluation of the rest facility may be scheduled after the installation is complete. Class 2 and 3 flightcrew member rest facilities will be inspected and evaluated by the POI having oversight responsibilities of the certificate holder. The AEG responsible for that airplane type will serve in an advisory role to the POI. The POI will confer with the AEG as necessary during this process. The certificate holder will provide the POI with the proposed ICA, technical report, approved data and other supporting data relative to the class of rest facility at the time of the qualification request. Also, in the event the design of the rest facility requires some preparation by the crew prior to use, such as expanding sections or leg and foot support, the evaluation request should include appropriate preparation procedures, and recommended qualification/training requirements.

1) Each rest facility is installed under a specific approval. The data contained in the approval specifies the design criteria, operational specifications material to be used along with the layout of the facility, as well as its location on the airplane. Each rest facility installed under a specific approval should be identical to another under of that same approval. For this reason, when the certificate holder prepares their technical report they should list each airplane with rest facilities (M/M/S, registration and serial number) corresponding to its installation approval source. Therefore, when evaluating a certificate holder's rest facility, the POI need only inspect one rest facility under that installation approval per airplane type.

2) The certificate holder will provide the POI with a copy of the technical report and other supporting documentation relative to the rest facility to be qualified. The POI will coordinate with the certificate holder to schedule a time and location to conduct the evaluation. They will conduct an evaluation and qualification to evaluate and inspect the rest facility for compliance with part 117. The qualification is accomplished by use of the Class 2 or 3 QAS checklist, as appropriate. Any question in the checklist that yields a "NO" response means the rest facility is not qualified for that classification. Therefore, to be qualified as a Class 2 or 3 rest facility, as appropriate, each question in the respective QAS must yield a "YES" response. Otherwise, the rest facility is not qualified.

3) If the POI has determines the rest facility meets either the Class 2 or 3 qualification, the POI will issue the appropriate QAS for that rest facility classification. A copy of the QAS will be provided to certificate holder. The QAS will remain in effect until a modification to the rest facility or a component of the rest facility renders it noncompliant with the criteria and specifications prescribed in part 117 for that classification, or the FAA

determines the rest facility no longer meets the criteria and specification(s) prescribed in part 117 for that classification.

I. FRMS Application for Rest Facilities. In the event a certificate holder elects to apply for an FRMS authorization for rest facilities, the POI (or AEG for class 1) should direct the certificate holder to review the current edition of AC 120-103, Fatigue Risk Management Systems for Aviation Safety, and contact AFS-200 at 202-267-8166. All FRMS applications and authorizations are processed by AFS-200.

J. Modifications and Repairs to Rest Facilities. Modifications and repairs that alter any part of the original specifications of the rest facility may disqualify it from the previously qualified classification.

K. Requalification of Previously Qualified Rest Facilities. Requalification of a previously qualified rest facility is required when an item or component associated with the rest facility is modified or altered in any way, except when an inoperative item or component of the rest facility is covered and properly deferred in accordance with the certificate holder's FAA-approved MEL and its associated procedures. The purpose for requalifying a previously qualified rest facility is to determine that the modification(s) or alteration(s) have not changed the facility's physical specifications beyond that classification previously qualified and is in compliance with part 117. If the FAA determines the modified or altered rest facility does not meet the classification previously qualified, the rest facility may be evaluated to a different (lower) classification, if applicable. If the FAA determines that the rest facility does not meet any of the three classifications, the airplane may not be used for augmented flightcrew operations and may not use the augmented FDP limits while operating that airplane. If determined that the rest facility does not meet any of the three classifications, or if a rest facility loses its qualification, the POI must remove the airplane from the certificate holder's OpSpec A117.

1) The AEG responsible for that airplane type is responsible for inspection, evaluation and requalification of previously qualified Class 1 rest facilities. Inspection and evaluation of previously qualified Class 2 and 3 onboard rest facilities is the responsibility of the POI. The AEG responsible for that airplane type will serve in an advisory role to the POI. The POI will confer with the AEG as necessary during this process.

2) For requalification of a Class 1 rest facility, the AEG will follow the same process outlined in this document for the qualification of Class 1 rest facilities. For Class 2 and 3 rest facilities, the POI having oversight responsibility of the certificate holder will follow the same process outlined in this document for the qualification of Class 2 and 3 rest facilities, as appropriate.

3) Once the airplane's onboard rest facility has been satisfactorily requalified, the POI will complete the applicable QAS. The completed QAS will initiate the update to the certificate holder's OpSpec A117. The qualification will remain in effect until a modification to the rest facility or a component of the rest facility renders it noncompliant with the specifications prescribed in part 117, or the FAA determines the rest facility no longer meets the specification(s) prescribed in part 117 for that classification.

L. Upgrading a Rest Facility. In some cases, the certificate holder may upgrade their rest facility to meet the specifications for a higher rest facility classification, which will require that rest facility to be requalified before using the FDP limits applicable for the higher rest facility classification. If the requalification is satisfactory to a higher classification, prior to using the airplane for augmented operations with the higher FDP limits, the certificate holder's OpSpec A117 must be updated to reflect the newly qualified rest facility.

M. Downgrading a Rest Facility. If a rest facility is downgraded to a lower classification for reasons other than those identified in the certificate holder's FAA-approved MEL, the POI must reflect this downgraded status by conducting an evaluation and qualification of the rest facility, complete the appropriate class of QAS, and reissue the certificate holder OpSpec A117 reflecting the new classification of rest facility and number of sleep surfaces under that new classification.

N. FRMS Authorization. In certain cases a certificate holder may elect to apply for an FRMS authorization specific to a rest facility. For example, a certificate holder's rest facility may not comply with the all the criteria and specifications outlined in part 117 for a Class 1. The certificate holder would develop an alternative method of compliance (AMOC) that demonstrates an equivalent level of safety applicable to the safety standards set forth in part 117. All FRMS applications should be submitted to AFS-200 for processing (refer to AC 120-103). AFS-200 will coordinate directly with the certificate holder and involve the POI throughout this process. After completion of the studies and validation of the data collected, if the FRMS application is approved, AFS-200 will provide the POI with an approval memo classifying that rest facility to its demonstrated classification based upon the validated AMOC and associated data. In addition, AFS-200 will provide the POI with an OpSpec A318 (FRMS Authorization) template containing the pertinent data to be populated into the OpSpec, which will include the applicable conditions and limitations for that authorization.

O. Issuance of the QAS and OpSpec A117. Prior to conducting augmented flightcrew operations, and using the augmented flightcrew member FDP limits, the certificate holder must be issued OpSpec A117 reflecting the airplane and the classification of rest facility to be used. The issuance of OpSpec A117 is contingent on the completion of the appropriate QAS qualifying that rest facility under one of the three classifications. The POI should refer to the guidance in Volume 3, Chapter 18, Section 3 for the issuance of OpSpec A117. OpSpec A117 must contain the following information:

- 1) M/M/S,
- 2) Airplane registration number,
- 3) Airplane serial number,
- 4) Qualification date,
- 5) Classification of rest facility, and
- 6) Number of installed sleep surfaces for that classification.

Figure 3-191. Qualification Analysis Statement Class 1 Rest Facility

QUALIFICATION ANALYSIS STATEMENT			
CLASS 1 REST FACILITY			
Certificate Holder	Certificate No.	TC/STC/DER Approval	
Make/Model/Series	Registration No.	Serial Number	No. of Sleep Surfaces
	N		

A Class 1 rest facility is defined in Title 14 Code of Federal Regulations (14 CFR) part 117 as a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flightcrew member to control light, and provides isolation from noise and disturbance.

Certification of this Qualification Analysis Statement (QAS) qualifies this installed onboard flightcrew member rest facility as a Class 1 rest facility. Unless otherwise authorized by an FAA-approved Fatigue Risk Management System (FRMS), when conducting augmented flightcrew member operations, the certificate holder and the flightcrew members must comply with the maximum flight duty period limits (FDP) prescribed in Table C of 14 CFR part 117 based upon the use of this qualified Class 1 rest facility, the flightcrew member's time of start and the number of assigned flightcrew members. However, when an augmented flightcrew consisting of four or more pilots using multiple classes of rest facilities installed on a single aircraft, the maximum FDP limits applicable to the lowest classification of installed rest facility (Class 1 is the highest and Class 3 is the lowest classification) apply based upon the number of assigned flightcrew members, start time of the flightcrew member's FDP, and classification of rest facility.

This qualification will remain in effect until a modification to this rest facility renders it noncompliant with the specifications qualifying it as a Class 1 rest facility, or the FAA determines the rest facility no longer meets the requirements prescribed in 14 CFR part 117 for a class 1 rest facility.

Modifications and repairs that alter any part of the original specifications for a Class 1 rest facility may disqualify it from its previously qualified classification. If the rest facility classification is disqualified, requalification of the rest facility is required, except when an inoperative item or component associated with this rest facility is covered and deferred in accordance with the certificate holder's FAA-approved minimum equipment list (MEL).

Prior to conducting augmented flightcrew operations, the certificate holder must be issued OpSpec A117,

<i>Use of Onboard Flightcrew Member Rest Facilities</i> , authorizing the use of specific onboard rest facilities.			
Evaluation and Qualification Analysis			
Item No.	Item	YES	NO
1.	Is the physical location of each rest facility of this classification located in an area other than the economy section of the airplane?		
2.	Does the sleeping surface a bunk or other surface allow for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled?		
3.	Are the sleeping surfaces designed so that they are flat and as level as practicable during cruise flight?		
Item No.	Item	YES	NO
4.	Do the dimensions of each sleep surface meet the 30"x78" recommendation and the volume per individual of 1.0 m ³ (35 feet ³).		
5.	Does the rest facility provide a suitable means to ensure occupant privacy for each sleeping surface area, e.g., curtains in an over-and-under arrangement or a divider curtain in a side-by-side arrangement.		
6.	Does the rest facility allow the flightcrew member to control light?		
7.	Does the facility provide isolation from noise and disturbance?		
8.	Is the rest facility area temperature-controlled?		
9.	Is airflow and temperature control available to provide a uniformly well-ventilated atmosphere free from drafts, cold spots, and temperature gradient?		
10.	Are suitable personal articles stowage and occupant restraint systems provided to each occupant's sleeping surfaces as well as each occupant of any seats located in crewmember rest facilities?		
11.	Are there one or more operational lighted "FASTEN SEAT BELTS" signs within the view of the occupants of each sleeping surface located within the rest facility?		

	a.) If so, are these lighted signs dimmable for sleeping purposes?		
12.	Is an operational interphone available for the cockpit crewmembers to communicate with the sleeping crewmember(s)? Note: The FAA recommends that the public address system or an alternative means should include provisions to provide only relevant information to crewmembers in the crewmember rest facility (e.g., in flight emergencies, aircraft depressurization, preparation of compartment occupants for landing).		
13.	Is approved oxygen equipment provided for each crewmember using a sleeping surface, including an aural alert to awaken a sleeping crewmember?		
14.	Does the rest facility have operational emergency lighting?		
15.	Does this rest facility meet the qualification specifications for a class 1 rest facility?		
Item No.	Comments and Remarks		
Qualification Conducted By:			

Inspector	Date	Office Routing Symbol	

Figure 3-192. Qualification Analysis Statement Class 2 Rest Facility

QUALIFICATION ANALYSIS STATEMENT			
CLASS 2 REST FACILITY			
Certificate Holder	Certificate No.	STC/DER Approval	
Make/Model/Series	Registration No.	Serial Number	No. of Sleep Surfaces
	N		

A Class 2 rest facility is defined in Title 14 Code of Federal Regulations (14 CFR) part 117 as a seat in an aircraft cabin that allows for a flat or near flat sleeping position; is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation; and is reasonably free from disturbance by passengers or flightcrew members.

Certification of this Qualification Analysis Statement (QAS) qualifies this installed onboard flightcrew member rest facility as a Class 2 rest facility. Unless otherwise authorized by an FAA-approved Fatigue Risk Management System (FRMS), when conducting augmented flightcrew member operations, the certificate holder and the flightcrew members must comply with the maximum flight duty period limits (FDP) prescribed in Table C of 14 CFR part 117 based upon the use of this qualified Class 2 rest facility, the flightcrew member's time of start and the number of assigned flightcrew members. However, when an augmented flightcrew consisting of four or more pilots using multiple classes of rest facilities installed on a single aircraft, the maximum FDP limits applicable to the lowest classification of installed rest facility (Class 1 is the highest and Class 3 is the lowest classification) apply based upon the number of assigned flightcrew members, start time of the flightcrew member's FDP, and classification of rest facility.

This qualification will remain in effect until a modification to this rest facility renders it noncompliant with the specifications qualifying it as a Class 2 rest facility, or the FAA determines the rest facility no longer meets the requirements prescribed in 14 CFR part 117 for a Class 2 rest facility.

Modifications and repairs that alter any part of the original specifications for a Class 2 rest facility may disqualify it from its previously qualified classification. If the rest facility classification is disqualified, requalification of the rest facility is required, except when an inoperative item or component associated with this rest facility is covered and deferred in accordance with the certificate holder's FAA-approved minimum equipment list (MEL).

<p>Prior to conducting augmented flightcrew operations, the certificate holder must be issued OpSpec A117, <i>Use of Onboard Flightcrew Member Rest Facilities</i>, authorizing the use of specific onboard rest facilities.</p>			
<p>Evaluation and Qualification Analysis</p>			
Item No.	Item	YES	NO
1.	Is the rest facility located in an area other than the economy section of the airplane?		
2.	Is the rest facility placarded to designate it as a class 2 rest facility?		
3.	Does the seat (sleep surface) in the rest facility allow for a flat or near flat sleeping position?		
4.	Is the rest facility separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation?		
5.	Is the location of the rest facility reasonably free from disturbance by passengers or flightcrew members?		
6.	Is the rest facility configured so that a passenger may not occupy a seat beside the flightcrew member?		
7.	With the curtain fully extended around the seat, does the curtain provide darkness?		
8.	Does this rest facility meet the qualification criteria and specifications for a class 2 rest facility?		
Item No.	Comments and Remarks		



Figure 3-193. Qualification Analysis Statement Class 3 Rest Facility

QUALIFICATION ANALYSIS STATEMENT			
CLASS 3 REST FACILITY			
Certificate Holder	Certificate No.	STC/DER Approval	
Make/Model/Series	Registration No.	Serial Number	No. of Sleep Surfaces
	N		

A class 3 rest facility is defined in Title 14 Code of Federal Regulations (14 CFR) part 117 as a seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

Certification of this Qualification Analysis Statement (QAS) qualifies this installed onboard flightcrew member rest facility as a Class 3 rest facility. Unless otherwise authorized by an FAA-approved Fatigue Risk Management System (FRMS), when conducting augmented flightcrew member operations, the certificate holder and the flightcrew members must comply with the maximum flight duty period limits (FDP) prescribed in Table C of 14 CFR part 117 based upon the use of this qualified Class 3 rest facility, the flightcrew member's time of start and the number of assigned flightcrew members. However, when an augmented flightcrew consisting of four or more pilots using multiple classes of rest facilities installed on a single aircraft, the maximum FDP limits applicable to the lowest classification of installed rest facility (Class 1 is the highest and Class 3 is the lowest classification) apply based upon the number of assigned flightcrew members, start time of the flightcrew member's FDP, and classification of rest facility.

This qualification will remain in effect until a modification to this rest facility renders it noncompliant with the specifications qualifying it as a Class 3 rest facility, or the FAA determines the rest facility no longer meets the requirements prescribed in 14 CFR part 117 for a Class 3 rest facility.

Modifications and repairs that alter any part of the original specifications for a Class 3 rest facility may disqualify it from its previously qualified classification. If the rest facility classification is disqualified, requalification of the rest facility is required, except when an inoperative item or component associated with this rest facility is covered and deferred in accordance with the certificate holder's FAA-approved minimum equipment list (MEL).

Prior to conducting augmented flightcrew operations, the certificate holder must be issued OpSpec A117,

