GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM

Instrument Procedures Group
May 4-5, 1998
HISTORY RECORD

FAA Control # 98-01-197

SUBJECT: Air Carrier Compliance with FAA-specified Climb Gradients

BACKGROUND/DISCUSSION: Unlike balanced runway and takeoff engine failure computations, air carriers are not required by the FAA to provide flight crews with performance data to determine whether an a normally operating aircraft can make good the climb gradient specified on an instrument departure procedure. Not only do crews need these data in a form that can easily be used just prior to departure, the crews need to know the optimum flight profile to be used to assure that the presumed performance is achieved during the departure procedure.

In many cases, air carrier aircraft performance is sufficiently robust as to implicitly assure that specified climb gradients are exceeded simply by flying the nominal departure profile. But, this assumption is not valid at terrain-critical locales, where steep gradients must be maintained for several thousand vertical feet. Unless the FAA mandates an objective, valid performance-calculation program for air carriers, sooner or later a CFIT accident will occur at a mountain airport, which could have been prevented had a requirement been in place to assure compliance with the specified climb gradient under actual density altitude and aircraft takeoff weight conditions.

RECOMMENDATION: ALPA met with AFS-200, 400 and AGC-200 August 5, 1997, and set forth this issue. The FAA thus far has failed to respond to ALPA's legitimate safety-of-flight concerns. On January 6, ALPA requested a legal interpretation on the matter of climb gradients, a copy of which is attached to this agenda item. AFS-200 should act immediately to require certificate holders to provide flight crews with climb-gradient-performance calculation tools, including the required flight profiles for a given departure procedure.

COMMENTS: This affects the standard operations specifications and directive/training material provided to air carrier flight crews.

Submitted by Captain Tom Young, Chairman
Charting and Instrument Procedures Committee
AIR LINE PILOTS ASSOCIATION
PH: (703) 689-4176
FAX: (703) 689-4370
April 22, 1998

attachment

January 6, 1998

Mr. Nicholas Garaufis
Office of the Chief Counsel, AGC-1
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Subject: Request for Legal Interpretation

Dear Mr. Garaufis:

The Air Line Pilots Association is requesting that you provide us with a legal interpretation about whether air carrier operators (operating under either 14 CFR Parts 121 or 135) are required to assure that aircraft taking off and departing an airport under Instrument Flight Rules (IFR) can comply with climb gradients set forth in published IFR departure procedures or standard instrument departure procedures (SID). Further, we need you to clarify your November 30, 1993, legal interpretation that indicates that a published IFR departure procedure must always be used by a pilot under Part 121 or 135, even where a SID exists for the airport and such a SID is assigned by ATC to a departing air carrier aircraft.

In your letter of legal interpretation to Mr. McBride and Mr. Birdsong, dated November 30, 1993, you set forth the absolute requirement for 14 CFR 121/135 operators to use published IFR departure procedures, and we quote:

"Under Part 121 or Part 135, a pilot is required to follow any published IFR departure procedure regardless of whether the flight is conducted under VMC or under IMC."

Many IFR departure procedures and SIDs contain specified climb gradients in addition to a specific flight track. A few examples are:

1. *Reno, Nevada (KRNO) IFR departure procedure for Runway 16L: Minimum climb gradient of 510 feet per nautical mile to 8,500 feet, msl. (4,095-foot altitude gain required with specified climb gradient.) Aircraft that can make good the specified climb gradient are authorized standard (and by operations specifications, lower-than-standard) takeoff minimums. Aircraft that cannot make good the specified climb gradient are required to have a takeoff weather condition of not less than a ceiling of 3,600, visibility 2 miles.*

2. *Eagle, Colorado (KEGE) IFR departure procedure for Runway 25: Minimum climb gradient of 750 feet per nautical mile to 11,200 feet, msl. (4,744-foot altitude gain required with specified climb gradient.) Aircraft that can make good the specified climb gradient are required to have a takeoff weather condition not less than a ceiling of 1,700, visibility 3 miles. Aircraft that cannot make good the specified climb gradient are required to have a takeoff weather condition not less than a ceiling of 5,300, visibility 3 miles.*

3. *Los Angeles, California (KLAX) GABRE SID for Runways 6L/R and 7L/R: Minimum climb gradient of 330 feet per nautical mile to 12,000 feet, msl. (Approximate 11,900-foot altitude gain required with specified climb gradient for*

all referenced runways.) There are no alternative takeoff minimums on this SID for aircraft that cannot make good the specified climb gradient.

In Example 3, the climb gradient is mandatory without exception, because the departure is a SID. Most SIDs do not have alternative takeoff minimums without climb gradient.

Examples 1 and 2 are IFR departure procedures, with alternative high weather minimums for aircraft that cannot comply with the specified climb gradient. However, the FAA has never provided guidance to the aviation community about how to avoid controlled flight into terrain (CFIT) at mountain-area airports where a specified climb gradient cannot be complied with. In any case, the air carriers presume that their pilots will depart with the lowest possible takeoff minimums. Thus, for both the CFIT and economics-of-operations issue, the higher minimums are for all practical purposes useless.

14 CFR, Parts 121.189 and 135.379, require FAR 121 and 135 operators, dispatch departments and pilots to calculate the aircraft's performance capabilities to comply with a narrow, hypothetical takeoff flight path which is 600 feet wide, and extends to the point where the aircraft reaches 1,500 feet above departure end runway elevation. Pilots are provided with the necessary aircraft performance data to compute this takeoff flight path, which terminates once the aircraft has gained 1,500 feet of altitude, well short of the 11,900' at LAX in the example above. This calculation serves to determine whether sufficient runway is available for takeoff, whether the aircraft can safely abort the takeoff in event of an engine failure below the critical engine failure speed, and whether the aircraft can make good the 14 CFR 25-defined takeoff flight path to 1,500 feet, in the event of an engine failure. Further, flight crews are trained at every recurrent and proficiency training session on the correct power settings and flight profile to be used to assure that the assumed performance data will assure compliance with the 14 CFR25-defined takeoff flight path to 1,500 feet of altitude gain.

There is not, however, any FAA regulatory requirement or other FAA air-carrier-oversight function requirement that operators, dispatch departments, or pilots determine whether aircraft performance capabilities exist to comply with sustained climb gradients well above a 1,500-foot altitude gain, even with the normal operating condition of all engines operating. Further, there is no training or instruction given to flight crews about the required power settings and vertical flight profiles required to achieve climb gradients for several thousands of vertical feet, such as set forth in our three examples earlier in this letter.

Our specific questions are:

1. *Are climb gradients published in IFR departure procedures and SIDs merely guidelines, or is adherence to them mandatory when either a SID is assigned or an IFR departure procedure is used?*

2. *If adherence to such climb gradients is mandatory, are air carrier operators and flight dispatch departments required to provide flight crews with airport and runway-specific performance data and required vertical flight profiles to be flown to assure making good the specified climb gradient for each particular IFR departure procedure or SID to be used, assuming all engines operating?*

3. *Absent the air carrier providing flight crews with airport and runway-specific performance data and required vertical flight profiles to be flown to assure*

making good the specified climb gradient for each particular IFR departure procedure or SID to be used, what is the FAA-approved departure flight maneuver that will assure legal compliance with an IFR departure procedure's or SID's specified climb gradient?

4. *If an operator or pilot elects to use a higher-than-standard takeoff ceiling and visibility minimum as an alternative to an IFR departure procedure's specified climb gradient, what is the FAA-approved maneuver required to assure legal compliance with the higher minimum?*

5. *In view of the seemingly absolute mandatory language of your November 30, 1993, letter of legal interpretation, is it legal for a Part 121 or 135 pilot to use an ATC-assigned SID instead of a published IFR departure procedure for an airport that has both SIDs and a published IFR departure procedure?*

Thank you for your consideration of our request for these legal interpretations and related information.

Sincerely,

Tom Young, Chairman
Charting and Instrument Procedures Committee

TY:amr

cc: P. Lane, AGC-230
Q. Smith, AFS-200

INITIAL DISCUSSION (Meeting 98-01): This issue was presented by Tom Young on behalf of ALPA. They expressed concern that air carriers are not required by the FAA to provide flight crews with performance data to determine whether a normally operating aircraft can make good a climb gradient specified on an instrument departure procedure. ALPA had previously requested a legal interpretation of this issue and provided a copy of their request to the group. ALPA believes this affects the standard operations and specifications and directive/training material provided to flight crews. ALPA also believes this to be a potential CFTI issue and cited examples of situations at Minneapolis. Paul Smith, NBAA, stated that this should not be an ACF issue. Bob Wright, AFS-400, suggested the issue be brought before a FAA safety commission. Item to be held over pending assignment of an OPI. Howard Swancy (AFS-420) has initially taken the issue to AFS-200 (Dave Cady) as a possible FSIB item. Action: AFS-420.

MEETING 98-02: Howard Swancy, co-chair, proposed a meeting with AFS-420, AFS-200, ALPA and AGG to address this issue. Tom Young, ALPA, briefed that there was an FAA/AFS-400 commitment made during a meeting on August 5, 1997. Tom also emphasized AFS-200 participation. Kevin Comstock, ALPA, stated that he had spoken with AFS-200 and they don't believe this is a problem on public procedures and is handled on a case-by-case basis on special procedures. AFS-200 is working on a FSIB; however, it is

not mature enough to circulate for comment. It has also being worked as a low priority item. In short, no action has been taken to resolve this issue. Action: AFS-200.

MEETING 99-01: Jim Gardner, AFS-200 briefed that no action has been taken on this issue due to personnel constraints and changes. Tom Young, ALPA, re- briefed their concern and offered to meet with AFS-200 to re-emphasize the problem and to volunteer industry assistance in the solution. AFS-200 agreed to more aggressively work the issue with ALPA input. Action: AFS-200.

MEETING 99-02: An AFS-200 representative was not available to address this issue. Will Swank, AFS-200, was in attendance for the P-56 airspace issue and was tasked to request the AFS-200 representative assigned this issue to forward a status update on initiatives thus far for inclusion in the minutes. He agreed to convey the message. Wally Roberts, ALPA, briefed that his organization has sent a letter to a higher level expressing concern that the issue is not being actively pursued. Action: AFS-200.

MEETING 00-01: Will Swank, AFS-200, reported that the AFS-200 specialist assigned this issue was transferred and that no action has been taken. He stated that AFS-200 agrees with the importance of the issue as presented; however, staffing constraints have precluded action. Kevin Comstock, ALPA, is still working their organization internally to assess impact on their customers. Action: AFS-200.

MEETING 00-02: An AFS-200 representative was not present to discuss the issue. Discussion is continued to the next meeting. Action: AFS-200.

MEETING 01-01: An AFS-200 representative was not present to discuss the issue. Discussion is continued to the next meeting. Action: AFS-200.

MEETING 01-02: An AFS-200 representative was not present to discuss the issue. Discussion is continued to the next meeting. Action: AFS-200.

MEETING 02-01: Jim Gardner, AFS-200, responded to the issue and was provided an update by Wally Roberts, ALPA. Wally re-stated that the FAA has no requirement for operators to provide performance data to be in the cockpit. Jim provided a short briefing on POI requirements and procedures for Part 121/135 operators and stated that AFS-200 has had no time or resources to address this particular issue. Wally briefed that ALPA had also raised the issue with FAA's General Council in 1998, but has received no response. Jim suggested that ALPA follow up that correspondence which could elevate the issue in AFS-200. Wally agreed to do so. Action: ALPA & AFS-200.

MEETING 02-02: Dave Kountz, a newly assigned specialist on detail from the Pittsburgh FSDO to AFS-220, stated that he will pursue the issue. He will attempt to prod AGC for a response to the ALPA letter of 1998. Dave is also an assistant POI for US Airways and will use this position to also try to determine the actual impact on air carriers. It is also recommended that ALPA continue to follow up their AGC letter for response. ACTION: AFS-220 and ALPA.

MEETING 03-01: There was no AFS-200 representative at the meeting to update the issue. ALPA has had no further success in getting a response from AGC-200. Status unchanged. ACTION: AFS-220 and ALPA.

MEETING 03-02: There is no change in status. An AFS-200 representative was not present to discuss the isue, nor did AFS-200 provide a response for an update to the ACF-IPG chair. Mark Ingram, ALPA, noted that ALPA did not send a follow up letter to AGC as recommended at the last meeting. Bill Hammett, AFS-420 (ISI), stated that it is apparent that the ACF is powerless to get response from AGC and AFS—200. The issue has been on the table for over 5 years without action. Bill again requested that ALPA review the importance of the issue. If deemed important, then ALPA should re-send their letter to AGC. Bill also agreed to draft a letter for the ACF-IPG chair to send to AFS-1 requesting that AFS-200 participate in ACG meetings on a full time basis. ACTION: ACF-IPG Chair & ALPA.

MEETING 04-01: Jerry Ostronic, AFS-220, apologized for past lack of support from AFS-200 on resolving this issue. They appreciate the significance of the issue; however, staffing constraints precluded action. He briefed that he has recently contacted AGC regarding this subject and they hope to have a response to the ALPA letter by the end of May. His office is also looking for possible solutions in Part 121.97 and pilot-in-command actions at special airports. He requested more specifics; e.g. airports, procedures, and what aircraft may be affected. Kevin Comstock, ALPA, responded that the problem exists at all airports with a climb gradient required departure. Kevin Jones, Southwest Pilots Assn., offered the LOOP 4 SID out of LAX as a classic example. Mark Ingram, ALPA, added that the only solution is that it must be a dispatch requirement to advise aircrews what actions are necessary to meet a required climb gradient. Jerry responded that there are several ways to address the problem; e.g., reduce weight, increase thrust, etc. Mark asked if it was a legal requirement to meet published climb gradients. Jerry responded that AGC is currently addressing that question. The bottom line is that AFS-200 can't mandate what is not regulatory. The first step is to get an AGC opinion. If AGC responds yes, AFS-200 will implement the requirement. If the response is no, rulemaking action will be required. Jerry will continue to work the issue and report at the next meeting. Tom Schneider, AFS-420 thanked Jerry for representing AFS-200 and recommended they continue to be active ACF-IPG participants. ACTION: AFS-220.

MEETING 04-02: Tom Schneider, AFS-420, briefed that Jerry Ostronic, AFS-220, was unable to attend the meeting due to travel requirements. However, Jerry did provide a written status report on the issue, a copy of which follows:

October 19, 2004

Mr. Thomas E. Schnedier
Chair Aeronautical Charting Forum
Instrument Procedures Group

Please extend to your group my regrets for not being able to participate in this session of the group's meetings. What your group does is very important to aviation safety and is greatly appreciated by the Air Transportation Division. Unfortunately I have not mastered how to be in multiple places at the same time. During your meeting I will be overseas working on operational issues with the implementation of the Airbus A380.

I wanted to bring you and the group up to date on my efforts on the climb gradient flight crew information issue since our last meeting in April.

As you know rulemaking is a long process that can take several years depending on the priority of the project. In reviewing aircraft accident statistics we were unable to identify a significant accident that was a direct result of the flight crew not having gross climb gradient information available to them at departure. Without this sort of statistical information we did not feel we could elevate a rulemaking project on this issue to the priority level that would have it acted on quickly. We worked through existing regulation in an effort to find a section that may provide the FAA the latitude to levy this requirement on air carrier operators. In verbal discussions with our legal group we identified the possibility of this latitude under CFR Parts 121.117 and 121.97. We developed the guidance material and policy for implementing these requirements for air carrier operations under Part 121. After several renditions this material gained acceptance by all the branches within the Air Transportation Division.

This draft document was then provided to our legal council for their concurrence that the FAA has the legal authority to require this information be supplied to the flight crews by the operator. This legal review is the typical process when flight standards establishes regulatory policy.

I learned just this morning, from more senior legal council, that the current verbiage in Parts 121.117 and 121.97, and the preamble to those regulations does not support our proposed policy and guidance on requiring air carrier operators to supply gross climb performance information to their flight crews.

Unfortunately this takes us back to where we were at our April meeting. The recommendation from legal council, and my superiors, is to have the group, or members of the group, petition the FAA for rulemaking under CFR Part 11. Although our primary focus for policy and guidance material was operations under Part 121 many other types of operations may benefit from a rule changes to provide this information. The petition for rulemaking could include all the applicable rules for the various sections of the regulations to cover all types of operations or possibly a change to CFR Part 91 Subpart B, which would probably accomplish the same objective.

I am sorry I do not have more encouraging information to pass along at this time. I hope and trust you will have a productive meeting and look forward to working with you at the next meeting.

Sincerely

Jerry Ostronic
FAA AFS-200

MEETING 04-02 (Continued): Tom read the report and a copy was provided all attendees and further discussion followed. Frank Flood, Air Canada, briefed information and provided an example table (included below) that is currently available from aircraft manufacturers. Frank provided a sample table that is included in Air Canada's Flight Operations Manuals, a copy of which is attached to this synopsis. The group consensus was that the table would be a useful tool. Mitch Scott, Continental Airlines, voiced objection to a rulemaking effort that would levy the performance requirement on dispatchers. Dispatchers would not be able to provide an immediate, real-time response to requests due to other job requirements. Mark Ingram, ALPA, requested the FAA continue to pursue a formal response from AGC. Tom Schneider, AFS-420, stated the issue would remain open with AFS-200 as OPR. ACTION: AFS-220.

Issue 98-01-197- Status Update by Frank Flood, Air Canada

Air Canada research into this issue indicates that there are currently tables/charts available to help resolve this issue. For example, the Airbus chart below shows flap, pressuer altitude, and outside air temperature, and results is a climb gradient. This performance data from the manufacturer allows pilots and dispatchers to be proactive in meeting specified climb gradients. It can also serve as a useful tool for procedure designers and regulators in meeting their requirements.

NORMAL PACK FLOW
ANTI-ICE OFF

ALL ENGINES CLIMB GRADIENT
(FT/NM)

A319-112
PERF ENG
AUG 2004

	AIRPORT PRESS ALT (FT ASL)	OUTSIDE AIR TEMPERATURE (°C) OR FLEX TEMPERATURE (°C)					
		0	10	20	30	40	50
CONF 1	0	476	471	462	435	381	327
	1000	460	454	448	412	358	306
	2000	442	438	430	387	332	287
	3000	425	420	410	364	309	
	4000	409	405	387	340	290	
	5000	394	389	365	318	272	
	6000	378	375	344	297	263	
	7000	366	362	326	278	255	
	8000	355	348	311	265		
	9000	347	335	294	256		
CONF 3	0	471	465	460	432	378	325
	1000	455	450	442	408	354	309
	2000	437	431	425	383	329	302
	3000	421	415	406	361	308	
	4000	405	401	384	338	300	
	5000	392	387	365	318	286	
	6000	385	381	352	305	277	
	7000	377	373	338	289	269	
	8000	369	362	323	278		
	9000	360	347	307	268		

ASSUMPTIONS:

- NO WIND
- 1500 FT THRUST REDUCTION ALTITUDE
- GOOD FOR ALL WEIGHTS UP TO 70000 KGS

Presented by: Captain Frank Flood
Organization: Air Canada
Phone: 905-676-4300 ext 6430
Fax: 905-676-2252
E-mail: frank.flood@aircanada.ca

MEETING 05-01: Jerry Ostronic, AFS-220, briefed that he has been continuing a dialog with FAA's Office of General Council (AGC). AGC initially did not want to pursue levying the climb gradient (CG) requirement through the rulemaking and public comment process. However, they are now re-thinking the issue and considering issuing a policy memorandum. Although this would also require a public comment period, it may be an easier solution than the rulemaking process. He also advised that AGC is more aggressively working a response to the ALPA letter of January 1998; it is still under discussion. Mark Ingram, ALPA, clarified the ALPA concern that high CGs are not being evaluated by dispatch. A discussion ensued regarding very high ATC required climb gradients. ACTION: AFS-220.

MEETING 05-02: Jerry Ostronic, AFS-220, briefed that the issue is still bring worked. In addition to requesting carriers to provide climb performance data in the cockpit, it also asked for a determination of which climb gradient was applicable when there were differences between the Obstacle Departure Procedure gradient and a gradient on a SID. Jerry stated that he has asked the NFPG to review these procedures and resolve differences. Bill Hammett, AFS-420 (ISI) noted that as a result of previous ACF discussions, policy has been written in Order 8260.46, *Departure Procedure Program*, to require all information applicable to a graphic DP, either ODP or SID, to be published on the chart. There should be no need for a pilot to refer to different pages to ascertain what climb gradient or takeoff minimums are applicable to a given procedure. Jerry noted that while this is true, not all locations have been updated. He further noted that if rulemaking was required, then it would require priority and funding. Jerry also stated that there is not a unanimous opinion within AFS and AGC on how to proceed. Mark Ingram, ALPA, questioned the timetable for a decision. Jerry responded that there was none. ACTION: AFS-220.

MEETING 06-01: Mark Ingram, ALPA, briefed that an AGC response to their follow-up letter was received on January 13, 2006. The response regarding the climb gradient (CG) validated there is no requirement for carriers to provide CG data to aircrews. Therefore, if ALPA desires to pursue the issue, then ALPA must initiate rulemaking under 14 CFR Part 11. In regard to Part 121/135 pilots flying an ODP or a SID, AGC ruled that a pilot could fly either procedure and be in compliance with the rule. However, if assigned a SID, the pilot may not fly the ODP unless receiving an amended ATC clearance as required by Part 91.123. Rich Boll, NBAA, stated that corporate pilots face the same lack of performance data. Vince Massimi, MITRE, noted that Part 121.189 requires engine out performance parameters, it seems logical that similar data would be required for Part 97 procedures. Bill Hammett, AFS-420 (ISI), asked whether the AGC response satisfied the issue as it stands before the ACF, recommending that if ALPA decides to request rulemaking; that would be an ALPA prerogative outside the ACF. Kevin Comstock, ALPA, responded that ALPA has not decided whether to pursue rulemaking. He also noted that AGC only responded to two of ALPA's original five questions. Kevin requested the issue remain open until ALPA decides their next course of action. He also stated that he thought the request for rulemaking would have more weight if presented from within FAA, e.g. AFS-200. Bill suggested that ALPA follow up with a request for an opinion to the remaining three questions while they have AGC's attention. Copies of the ALPA letter and the AGC response are included below. ACTION: ALPA.

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL
535 HERNDON PARKWAY ☐ P.O. BOX 1169 ☐ HERNDON, VIRGINIA 20172-1169 ☐ 703-689-2270
888-FLY ALPA (888-359-2572) ☐ FAX 703-689-4370

December 30, 2005

Mr. Andrew B. Steinberg,
Office of the Chief Counsel, AGC-1
Federal Aviation Administration
800 Independence Ave., S.W.
Washington, DC 20591

Subject: Status of 1998 Request for Legal Interpretation

Dear Mr. Steinberg,

The Air Line Pilots Association, International (ALPA) represents over 63,000 cockpit crewmembers at 40 airlines in the U.S. and Canada. We are writing to obtain the status of a request for legal interpretation we submitted to your office nearly eight years ago, on January 6, 1998 (attached), to which the FAA has not responded.

Since 1998 the Government/Industry Aeronautical Charting Forum (ACF), established by FAA Order 7910.5, has had an open agenda item on charted climb gradients. This agenda item is in reference to air carriers not providing pilots with performance data to determine if their aircraft can comply with charted climb gradients on departures based on current loading and atmospheric conditions. Flight Standards has stated that based on current regulations they have been unable to establish a requirement for air carriers to provide data to pilots that would help them determine if they can comply with charted climb gradients. Flight Standards has also said that depending on the response from AGC to our request for legal interpretation, they may at that time be able to institute such a requirement.

The request for legal interpretation has to do with non-standard climb gradients that are published on some departure procedures for use in normal operations (i.e. all engines operating). In order for pilots to determine if they can comply with these restrictions on the chart, pilots must be provided performance data. Pilots are not currently given the data to determine if their aircraft can comply.

Please note that our concern is not addressed by the use of engine-out procedures. Airlines provide data in the form of what track to fly for use in the event of an engine failure. However, this engine failure flight track is typically different than the normal

departures and in no way assist the pilot in determining compliance with meeting climb gradient requirements on the normal departures.

In ALPA's view, data that can be used by pilots to determine the ability to comply with normal departure procedure climb gradients is necessary to ensure that these procedures can be executed as charted.

Subsequent to our original request, we have made numerous phone calls attempting to resolve the apparent contradiction of pilots being required to verify performance but not being given the data with which to do so. In addition to those phone calls, we have faxed the original request two additional times at AGC-220's request. These faxes were sent on March 1, 1999 and June 29, 2001.

The complete history of discussions at the ACF on this item can be found by going to http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs420/acfipg/open/ and selecting item 98-01-197.

Please provide us with a status to our request for legal interpretation. If you have any questions please contact Kevin Comstock at 703-689-4176.

Sincerely,

Pedro Rivas/kc

Captain Pedro Rivas,
Director, Charting & Instrument Procedures

cc: Mr. Nicholas Sabatini, AVS-1
Mr. Thomas Toula, AFS-200
Mr. John McGraw, AFS-400

Kevin

U.S. Department
of Transportation
**Federal Aviation
Administration**

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

January 13, 2006

Captain Pedro Rivas
Director, Charting and Instrument Procedures Committee
Air Line Pilots Association, International
535 Herndon Parkway
Post Office Box 1169
Herndon, VA 20172

RE: Climb Gradient Information for Air Carrier Pilots

Dear Captain Rivas,

We received a copy of your letter requesting a legal interpretation of the Federal Aviation Regulations. In summary, you asked:

1. whether an air carrier operating in accordance with parts 121 or 135 is required to provide flight crewmembers with data necessary to assure that an aircraft can comply with the climb gradients specified in published instrument flight rules (IFR) departure procedures and standard instrument departure (SID) procedures; and
2. whether pilots operating under parts 121 or 135 are required to follow a published IFR departure procedure even when Air Traffic Control (ATC) assigns a SID to a departing aircraft.

First, please accept our apologies for the delay in issuing a response to your inquiry. As you are aware, the FAA has been working internally and with the Government/Industry Aeronautical Charting Forum (Forum) on this issue. We appreciate your efforts in resolving this aviation safety matter.

Regarding the first issue, there is presently no requirement in the Federal Aviation Regulations mandating air carriers or commercial operators to provide climb gradient data to flight crewmembers. Therefore, it would be necessary for the FAA to conduct rulemaking proceedings in order to impose this requirement. Section 5 of the Administrative Procedure Act defines rulemaking as the agency process for formulating, amending, or repealing a rule.[1] FAA rules are subject to public notice and comment prior

[1] 5 U.S.C. § 551 (2004).

ORIGINAL TO FILE

000034 JAN 23 '06

to implementation. You may file a petition for rulemaking in accordance with 14 C.F.R. part 11.

Your second area of concern involved the requirement for pilots to follow published IFR departure procedures. Specifically, you asked which procedure a pilot should follow if ATC issues a SID that differs from the published IFR departure procedure for a particular airport.

As an initial matter, it is helpful to clarify that a "published IFR departure procedure" may be a SID developed for ATC purposes or an obstacle departure procedure (ODP) developed for obstacle clearance purposes. ODPs are developed by the Aviation System Standards Division (AVN) within the FAA Flight Standards Service.[2] According to Flight Standards, ATC historically developed SIDs for purposes of expediting air traffic and maintaining aircraft separation. SIDs did not contain an assessment for obstacle clearance beyond the first en route navigational fix. Instead, the obstacle assessment along the SID route was terminated at the first en route airway fix even if the SID procedure had transition routes beyond that point. The SIDs contained a standard 200 feet per nautical mile climb gradient that provided obstacle clearance for most airports. Procedures requiring greater climb gradients were specifically tested and documented in the Terminal Procedures Publication as part of the procedure. Therefore, flight crews are provided with adequate obstacle clearance climb gradients, even when using a SID developed by ATC.

In recent years, AVN and ATC began developing ODPs that establish climb gradients for obstacle clearance beyond the first en route navigational fix. All airports with instrument approach procedures are assessed to determine if an ODP should be published. ODPs are published for airports with a required climb gradient of more than 200 feet per nautical mile for obstacle clearance. The ODPs are valid for all directions of flight unless otherwise stated in the ODP.

According to your letter, the question regarding which procedure a pilot must follow stems from FAA Interpretation 1993-30.[3] In that interpretation, the FAA stated that part 121 or 135 operators are required to follow "any published IFR departure procedure" regardless of the weather conditions. A SID issued by ATC and an ODP developed by AVN are both "published IFR departure procedures." Therefore, it is consistent with the 1993 interpretation and regulatory requirements for an operator to comply with either procedure. The pilot in command (PIC) has the authority to determine which procedure is most appropriate based on the circumstances of the flight. However, if the PIC desires

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[2] The FAA also notes that more restrictive departure procedures may be imposed on an air carrier via Operations Specifications. A carrier must always comply with the more restrictive procedures mandated by the Operations Specifications unless an emergency exists or the deviation is in response to a traffic alert and collision avoidance system resolution advisory. If a more restrictive procedure is mandated by the Operation Specifications, the pilot in command must seek an amended clearance from air traffic control. *See* 14 C.F.R. § 91.123 (2006).

[3] *See* Federal Aviation Decisions, published by West Publishing Company.

to use an ODP instead of the SID issued by ATC, the PIC must request an amended clearance in accordance with § 91.123.

We trust that the foregoing interpretation is responsive to your inquiry, and we apologize again for the delay in its issuance. This interpretation was prepared by the Operations Law Branch of the Office of the Chief Counsel, and coordinated with the Air Transportation and Flight Operations Divisions of the Flight Standards Service. Please contact us if we can be of further assistance.

Sincerely,

Rebecca MacPherson
Assistant Chief Counsel for Regulations

MEETING 06-02: Mark Ingram, ALPA, briefed that ALPA has not abandoned the possibility for requesting rulemaking. However, they would still prefer that it be initiated from within FAA. In the interim, they plan to address the subject through the PARC. Mark also noted that it has come to attention that RNAV SAAAR is recommending up to 425 Ft/NM climb gradients in the missed approach. Rico Carty, AFS-410, stated that FAA will not approve SAAAR operations unless the aircraft can demonstrate ability to meet specified climb gradients. Bill Hammett, AFS-420 (ISI) asked whether ALPA had contacted AGC for a response to the unanswered questions posed in their original letter. Mark replied they had not. Mark stated that ALPA has an "administrative commitment" to pursue the rulemaking process, but they also still believe the problem is larger than airlines-only and seek additional support. Richard Boll of NBAA agrees, stating that Part 91 and 135 operators will be affected similarly. The issue remains open pending an ALPA decision on rulemaking. ACTION: ALPA.

MEETING 07-01: Mark Ingram, ALPA, provided an update briefing as well as a chronological listing of ALPA actions on this issue since 1998 (See attachment). ALPA is now proposing that the FAA establish essentially the same guidance contained in AC 90-101, applicable to RNP (SAAAR) approaches (extract below), for all procedures with charted climb gradients [i.e. departures (ODPs and SIDs) and missed approaches for RNAV and conventional procedures regardless of whether they are public or special procedures].

AC 90-101, Appendix 2 extract:

"m. Non-Standard Climb Gradient. When the operator plans to use the DA associated with a non-standard missed approach climb gradient, he must ensure the aircraft will be able to comply with the published climb gradient for the planned aircraft loading, atmospheric conditions and operating procedures before conducting the operation. Where operators have performance personnel that determine if their aircraft can comply with published climb gradients, information should be provided to the pilots indicating the climb gradient they can expect to achieve."

Ernie Skiver, AFS-410, stated that pilots are currently using the rate-of-climb table. He believes that manufacturers should be able to provide the data to the aircrews. Rich Boll, NBAA, responded that maybe manufacturers can but they don't. Kevin Comstock, ALPA, emphasized that ALPA does not want the procedures published in AC 90-101; however, they do want the language published in other Orders. Tom Schneider, AFS-420 recommended that ALPA pursue rulemaking. Kevin responded that past history indicates that it won't do any good. It will achieve more by putting the requirement in other FAA Orders. Tom emphasized that this issue was going nowhere fast and he sees only 3 options: 1) Take to the PARC for emphasis; 2) Determine exactly what other ACs/Orders to publish the requirement; or, 3) Admit defeat. Wally Roberts, NBAA, recommended that AFS-410 take the issue to John McGraw, AFS-400, for PARC consideration. Mark Ingram, ALPA, also suggested an FAA simulator study. AFS-410 accepted the tasking to coordinate the issue with the Manager, AFS-400 for PARC consideration. ACTION: AFS-410.

Primary ALPA activities regarding ACF Issue 98-01-197

Chronology of Actions:	
Date:	**Item:**
05/28/97	Letter to Mr. Ed Mills, Airspace and Procedures Specialist at the Minneapolis ARTCC. SID revised to have MCA. Asked for Withdrawal of MSP Six SID until SID is revised to have climb gradient expressed due to MCA resultant high climb gradient. Also asked for region to inform carriers to give pilots data to determine ability to comply with the climb gradient.
06/04/97	Letter to Ms. Patricia Lane, AGC-200 with the subject of lack of performance data in the cockpit to determine climb gradient capability and ability to comply with required charted climb gradients.
07/17/97	Letter to Mr. David E. Hanley, Manager, Flight Standards Division, AGL-200 (Great Lakes Region) cc Kathy Hakula (now Perfetti), acting AFS-200 at the time, asking for the new climb gradient to be charted on MSP 6 & for help getting pilots data to determine if they can comply.
07/17/97	Letter to Yeske, Asst Mgr MSP ATCT-cc MSP ARTCC, AGL-200, AFS-1, 200, 400, 420, 440. ✓ Issues in the letter were: **1.** That the required worst case scenario climb gradient needs to be published on the SID including a NOTAM being issued until the actual chart change is published. **2.** That pilots need the performance data necessary to determine if the published climb gradient can be met under the current conditions (i.e., weight, density altitude, etc.). **3.** Notice that sent letter [dated same day, 7/17/97] to Mr. David E. Hanley, Manager, Flight Standards Division, AGL-200, requesting that an FSIB be issued directing all POIs to ensure that their airlines provide pilots with the necessary performance data to determine if they can meet required climb gradients. **4.** Because pilots do not have the data they need to make a valid determination on whether or not the crossing restriction can be met, we request that MSP Tower not issue the procedure until the FAA has required carriers to provide the previously stated data to pilots. We stated that we do appreciate that a NOTAM has been issued but without the data in the cockpit, the procedure is still not safe for use. The most effective solution to this problem would be for ATC not to issue the SID.

07/18/97	FAA AGL, Mr. Rasky telephones Kevin Comstock, ALPA staff and says he will take our concerns to Kathy Hakula (Acting AFS-200) & get back to us.
07/23/97	FAA Response to ALPA 07/07/97 Letter re Lack of Climb Gradient Information on MSP SIX SID. MSP FAA had NOTAM issued to provide climb gradient as we requested and then deferred the rest of our concerns including the issue of pilots not having the data needed to calculate whether they can comply to AFS-420, Dave Eckles.
08/5/97	Meeting with AFS-400 staff, AFS-200 staff, and chief counsel staff in Washington on August 5, 1997, to discuss our concerns with climb gradients.
01/06/98	Request for Legal Interpretation on Climb Gradients sent to Nicholas Garaufis (AGC-1), FAA legal, from Tom Young.
05/02/98	Meeting with BobWright (AFS-400) & Howard Swancy (AFS-420). We discussed that pilots need data for determining ability to comply with climb gradients. ALPA requested FAA to put in Opspecs that carriers provide climb gradient data to pilots. Additional points made by ALPA were that Air Traffic provides procedures they want to AVN. AVN looks to see if any TERPS obstacle/terrain problems if not then Air Traffic can do what they want. This is sometimes how the unreasonable climb gradients get on SIDs.
05/04/98	ALPA submits items to the Aeronautical Charting Forum (ACF) “98-01-197, Air Carrier Compliance with FAA-Specified Climb Gradients” which remains open as of ACF 07-01, 5/1-3/07. In addition we also submitted “98-01-204, Climb Gradients on Public Missed Approaches.”
7/23/98	ALPA-CHIPS letter of priority issues to Bob Wright, AFS-400 from Tom Young, CHIPS Chairman. Listed 15 items 2 of which were having to do with climb gradients:
8/12/98	Bob Wright’s response saying he will address each issue individually within the next 120 days and in the mean time has asked Howard Swancy to coordinate with us.
08/21/98	FAA Response to ALPA CG comments on draft 8260.40B, FMS Departure and missed approach procedure development criteria. The FAA referenced in its response a CFR that was applicable to engine-out climb performance requirements. This revealed that the FAA didn’t understand our concerns as they applied to 8260.40B.
01/05/99	Left message for Joe Conty, AGC atty for Part 121 regulations, asking for a status on our 1/6/98 request for legal interpretation on climb gradients.

03/01/99	Re-faxed the 01/06/98 request for legal interpretation letter to FAA Legal, Joe Conte, at his request after Kevin talked to him on the phone.
03/19/99	3/19/99 Joe Conte told me that Cecile O'Conner (202-267-3073), Acting Manager Air Traffic Law Branch (AGC-230) was assigned to work our climb gradient interp request. I called and left a message for Cecile on 3/19/99.
03/30/99	Gave Climb Gradient Issue Paper to AVR-1, McSweeney during his visit to ALPA. **ALPA Recommendations:** 1. AVR direct AFS-200 to act immediately and require air carrier operators (operating under either 14 CFR Parts 121 or 135) to provide flight crews with climb-gradient-performance calculation tools, including the required flight profiles for a given departure procedure. 2. Also insure that all climb gradients in excess of 200'/NM are published on procedures whether for terrain, obstacles or ATC purposes.
09/27/00	Meeting with Bob Wright (AFS-400). Discussed that AFS-200 agrees with our concerns but to resolve this issue there is a need for a new FAR and that hasn't been given the resources to be accomplished.
06/28/01	Re-faxed, a second time, the 01/06/98 request for legal interpretation letter to FAA Legal, Joe Conte. This time with a small summary of what we want an interpretation of in the remarks section of the fax.
07/09/01	John O'Brien, ALPA E&AS Director, gave bulleted list of ALPA issues on climb gradients to the FAA Administrator.
02/04/02	Simon Lawrence (ALPA CHIPS Chairman) gave Chronology of Climb Gradient issues to Kathy Abbott.
03/05/02	Telecom with AFS-420 - Carl Moore wanted ALPA's help in how to make a decision of whether a CG was too great or not since now based on criteria AVN has to get AFS approval for CGs greater than 500'. Simon and Wally couldn't help much since they want performance data given to pilot and AFS-420 couldn't help us in that because that is an AFS-200 issue. Resolution was that Carl would propose that their TRB (Technical Review Board), which meets typically once a week to review waivers and specials, take into account things such as airport elevation, procedure's track, terrain, etc. when deciding to approve CGs over 500' or not. Wally and Simon agreed that would be a step in the right direction.)
02/27/04	Chris Baum (ALPA E&AS Manager) to John McGraw (AFS-400) - Draft ALPA letter asking for Status of Climb Gradient Legal Interp Request.

01/03/05	ALPA letter Requesting Status of 01/06/98 Climb Gradient Legal Interp. This is 3rd written follow up to the original 1/6/98 letter.
1/13/06	Cobe Johnston (AFS-410) said that he was working with FAA Legal to generate a response to our 1998 request for legal interpretation. He needed to confirm that Pedro was the current Director of CHIPs and said that hopefully they would have the response out the door today or at least in the next couple days.
01/13/06	FAA response to 1/6/98 ALPA request for Climb Gradient interpretation. The response failed to respond to three of our five questions. AGC said that there is no regulatory basis for providing pilots with climb performance data. However, AGC failed to answer whether the charted climb gradients were mandatory and if so how a pilot could comply based on their determination that the data to determine if compliance is possible is not required.

MEETING 07-02: At the last meeting, AFS-410 had an IOU to coordinate with the AFS-400 Manager for a decision on how to address the issue; however, little progress has been made. Al Herndon, MITRE, briefed that since three-dimensional RNP operations will require space projection, perhaps a study on trajectory based operations should be developed and presented to the PARC in lieu of a rulemaking effort. Mark Ingram, ALPA, asked whether any strong effort had been made to have John McGraw take the issue to the PARC. Rich Boll, NBAA, stated that this is no longer an air carrier issue as it also affects Part 91 operators. He further stated that NBAA is concerned that FAA is pumping out procedures with specified climb gradients when pilots cannot know whether they can meet performance requirements. As a result, NBAA is on record as strongly supporting ALPA's position to have performance information provided by the original equipment manufacturer (OEM). Kevin Comstock, ALPA, asked the status of ALPA's recommendation to have AC 90-100 be updated to include the language in AC 90-101 regarding performance data in the cockpit. Mark Steinbicker, AFS-470, responded that AC 90-101 is applicable to RNP missed approach climb gradients only and he prefers to approach the requirement from a Terminal perspective. Tom Schneider, AFS-420, added that publication in an Advisory Circular or FAA Order doesn't force the requirement. Kevin agreed; however, he noted that publication in the ACs would provide an emphasis to elevate the issue. Kevin also recommended that the Chair of the ACF-IPG elevate this issue to the PARC as a consolidated Flight Standards/Industry ACF recommendation for incorporation of the AC90-101 language into AC90-100. Tom accepted the tasking. ACTION: ACF-IPG Chair.

MEETING 08-01: Tom Schneider, AFS-420, briefed that at the last meeting, it was recommended that he, as the Chair, write the PARC requesting their intervention in assuring the recommendation for incorporation of the AC 90-101 language into AC 90-100 is followed through. Tom stated the letter was submitted on December 5, 2007. A copy was included in the meeting handout material and is attached here  . Tom also followed up the letter with emails to the PARC Co-Chair on March 13th and April 14th; however, no response has been received. He agreed to continue follow up efforts. Roy Maxwell, Delta Air Lines, stated that airlines do not have the all-engine aircraft performance data from the manufacturers that would allow a pilot to determine whether the all-engine climb gradient requirements can be met. To simply ask carriers to provide the information to the pilot isn't going to make that happen. Rich Boll, NBAA, stated his organization is interested in more generic information; e.g., "the average climb gradient from takeoff to a specified altitude", not so much a detailed analysis like that required for engine out operations. Mark Ingram, ALPA, stated that regardless of who is responsible for calculating climb gradients, the pilot is responsible for meeting them. Roy noted that as a performance engineer, he doesn't see a meaningful way of providing the information to the pilot because the flight path is not a straight line, and the climb gradient is not constant. Rich added that climb gradients are mandatory when published on ODPs per the new Part 97.20 and Part 91.175(f). Frank Flood, ACPA, stated that situational awareness is key. There are aircraft performance tables available that Air Canada uses to provide their pilots something upon which to base a "go" or "no-go" decision. Rich said that he had been told by Learjet that this type of performance data is not provided in part due to varying speed/configuration profiles that the flight crew may use on takeoff, which makes it difficult to produce such data. Roy responded that this is probably because FAA hasn't provided the parameters needed to develop the data. Rich also suggested this issue be elevated to the USIFPP as Aircraft Certification may need to be involved. Tom, as Chair agreed to do this. In order to implement a 4D NAS, we will need to know where aircraft are, and projected to be, laterally and vertically; perhaps the Takeoff and Landing Performance Assessment Aviation

Rulemaking Committee (TALPA ARC) may want to look at the issue. Roy is a member of this ARC agreed to take the issue to this group; however, he noted this group may consider this issue beyond their scope. The ARC is first addressing landing procedures and will address takeoff performance later in the year. Tom will ensure the issue is forwarded to the USIFPP and will follow up on the letter to the PARC.
ACTION: ACF-IPG Chair and Delta Air Lines
