WEBVTT

1
00:00:00.020 --> 00:00:04.480
I'm very happy to do so. I am, uh, I am familiar with them, um,

2
00:00:04.500 --> 00:00:09.280
at least for Keith Gime. Uh, Keith Gime is, uh,

3
00:00:09.310 --> 00:00:10.960
here at Tetron Aviation.

4
00:00:10.990 --> 00:00:14.480
He's a test engineer and flight analyst in aircraft performance,

5
00:00:14.480 --> 00:00:18.680
flight characteristics and auto control. He's the lead engineer for,

6
00:00:19.780 --> 00:00:23.680
uh, handling qualities for the Cessna Sky Courier and, uh,

7
00:00:23.710 --> 00:00:27.600
lead flight test engineer for performance on the Cessna citation

8
00:00:28.150 --> 00:00:31.720
longitude. One of the things about Keith is,

9
00:00:31.740 --> 00:00:34.400
is he's a very prolific writer. When he writes a report,

10
00:00:34.460 --> 00:00:35.560
you gotta have a lot of time,

11
00:00:35.560 --> 00:00:38.080
you gotta have a lot of time to sit down and be able to read it.

12
00:00:38.620 --> 00:00:42.830
And sometimes you wonder if he's making, building a watch actually look simple.

13
00:00:43.540 --> 00:00:47.850
Presenting along with him is Shannon Lunds,

14
00:00:48.600 --> 00:00:53.530
also of Textron Flight Test Engineering manager for the Cessna Sky Courier

15
00:00:54.150 --> 00:00:57.250
and the lead flight test engineer for the Scorpion jet,

16
00:00:57.250 --> 00:00:59.930
primarily working on weapon separation, which, uh,

17
00:01:00.030 --> 00:01:03.890
to me would be absolutely amazing on a clean sheet airplane. And in fact,

18
00:01:04.510 --> 00:01:08.970
she has conducted flight testing on four clean sheet designs.

19
00:01:09.310 --> 00:01:11.170
So, Keith and Shannon, can you come up?

20
00:01:24.710 --> 00:01:27.470
I want to, I want to check both of you. Um, do you have light shavers on,

21
00:01:27.530 --> 00:01:30.060
on you? Uh, okay, good. Good. Thank you.

22
00:01:33.120 --> 00:01:37.540
All right, well, uh, thank you. Good morning. So, uh,

23
00:01:37.880 --> 00:01:42.460
we are here to give you a crash course in the changes to the F FAA

24
00:01:42.690 --> 00:01:45.420
part 23, amendment 64. Uh,

25
00:01:45.420 --> 00:01:48.340
part 23 is the certification, uh,

26
00:01:48.340 --> 00:01:51.220
or airworthiness criteria for small aircraft. Uh,

27
00:01:51.220 --> 00:01:54.220
we're gonna talk about the lessons learned on the Cessna Sky Courier,

28
00:01:54.220 --> 00:01:57.860
which was the first program to use the New Amendment level. Uh,

29
00:01:57.860 --> 00:02:02.460
it took us just over 18 months to write the certification plan for this project,

30
00:02:02.880 --> 00:02:06.300
but we're gonna give you the briefing in just under 18 minutes. Uh,

31
00:02:06.300 --> 00:02:09.860
we're gonna talk about the main changes to, uh, amendment 64,

32
00:02:10.360 --> 00:02:13.140
review the options for determining the means of compliance,

33
00:02:13.450 --> 00:02:16.860
introduce the Sky Courier, and then wrap up with the lessons learned.

34
00:02:19.650 --> 00:02:20.340
Right?

35
00:02:20.340 --> 00:02:25.040
So the Small Airplane Revitalization Act of 2013 called for the F

36
00:02:25.140 --> 00:02:29.600
AA to issue a final rule revising the certification requirements for small

37
00:02:29.880 --> 00:02:33.880
aircraft. The rule took effect in 2017 with Amendment 64.

38
00:02:34.460 --> 00:02:38.440
The FAA has since been working with the foreign civil aviation authorities to

39
00:02:38.440 --> 00:02:42.240

harmonize the airworthiness standards for Part 23 aircraft all over the world

40
00:02:43.040 --> 00:02:44.980
for those keeping current on Part 23.

41
00:02:44.980 --> 00:02:48.420
Amendment 65 was published this past December,

42
00:02:48.760 --> 00:02:50.340
but all of the changes were editorial.

43
00:02:50.480 --> 00:02:54.540
So we're gonna focus on the changes made at Amendment 64 for this presentation.

44
00:02:56.020 --> 00:03:00.800
Amendment 64 will apply to all new part 23 certification projects

45
00:03:01.340 --> 00:03:04.880
and for any existing projects that are gonna require, uh,

46
00:03:04.940 --> 00:03:09.320
new or novel features that would've previously required issue papers and special

47
00:03:09.320 --> 00:03:10.153
conditions.

48
00:03:13.720 --> 00:03:18.380
So the first major change in Amendment 64 is the move from prescriptive based

49
00:03:18.380 --> 00:03:22.420
requirements to performance-based regulations. Um,

50
00:03:22.420 --> 00:03:25.780
really the regulations have been paired down to their most basic level of what

51
00:03:25.780 --> 00:03:27.260
it means to have a safe airplane.

52
00:03:28.160 --> 00:03:32.140
It now establishes a basic level of performance for part 23 aircraft.

53
00:03:32.640 --> 00:03:36.260
So instead of describing how an aircraft should be designed,

54
00:03:36.600 --> 00:03:40.100
it now states the expected performance that you should have.

55
00:03:40.490 --> 00:03:44.740
It's then up to the applicant to determine the means of compliance, uh,

56
00:03:44.760 --> 00:03:48.900
for each regulation. Okay. Um,

57
00:03:48.900 --> 00:03:52.500
this change in approach allows the industry to find innovative and

58
00:03:52.500 --> 00:03:55.420
non-traditional ways to achieve the required safety outcome.

59
00:03:59.240 --> 00:03:59.710
Okay,

60
00:03:59.710 --> 00:04:03.610
so one of the more extreme examples of that pairing down of the regulations is

61
00:04:03.610 --> 00:04:05.850
for aircraft stability. Previously,

62
00:04:05.850 --> 00:04:10.030
there were four separate regulations for static stability. Um,

63
00:04:10.030 --> 00:04:14.030
they included specific conditions, configurations, acceptance criteria,

64
00:04:14.030 --> 00:04:18.590
everything that must be tested to meet that regulation. With Amendment 64,

65
00:04:18.590 --> 00:04:18.920
though,

66
00:04:18.920 --> 00:04:23.230
those were consolidated into one new regulation that says that the aircraft must

67
00:04:23.230 --> 00:04:25.390
have static, longitudinal, lateral,

68
00:04:25.390 --> 00:04:29.870
and directional stability in normal operations. But what does that mean? Well,

69
00:04:29.870 --> 00:04:33.110
now the applicant gets to determine how they're gonna show compliance with those

70
00:04:33.130 --> 00:04:37.110
new standards and gives the opportunity for new technology to be used during

71
00:04:37.110 --> 00:04:37.943
certification.

72
00:04:42.900 --> 00:04:44.150
Here we go. Uh,

73
00:04:44.150 --> 00:04:48.350
the second major change is the elimination of the normal acrobatic and utility,

74
00:04:48.570 --> 00:04:50.390
I'm sorry, commuter categories. Um,

75
00:04:50.390 --> 00:04:55.270
instead 23 2005 introduces certification levels one through

76
00:04:55.270 --> 00:04:58.190
four. Based on the number of passengers the aircraft can hold.

77
00:04:58.730 --> 00:05:03.590
The aircraft are then further classified by the performance level, which is, uh,

78
00:05:03.590 --> 00:05:06.430
corresponds to the maximum operating speeds of the aircraft.

79
00:05:06.980 --> 00:05:11.470
Amendment 64 still does maintain the max weight of 19,000 pounds

80
00:05:11.850 --> 00:05:14.630
and up to 19 passengers for part 23 aircraft.

81
00:05:16.100 --> 00:05:20.440
The certification levels implement the con concept of a safety continuum that

82
00:05:20.440 --> 00:05:24.320
attempts to balance the need for an acceptable level of safety with the burden

83
00:05:24.500 --> 00:05:25.800
to reach that level of safety,

84
00:05:27.170 --> 00:05:31.590
the higher levels of risk and corresponding less rigorous safety demonstrations

85
00:05:31.890 --> 00:05:34.150
are now accepted for more personal forms of travel.

86
00:05:34.640 --> 00:05:38.750
Keith is gonna talk more in a few minutes about the specifics level levels of

87
00:05:38.870 --> 00:05:39.950
scrutiny. With some examples,

88
00:05:40.940 --> 00:05:43.980
a single aircraft can be certified with more than one level,

89

00:05:44.410 --> 00:05:46.900
such as the Cessna Sky Courier. For example, we,

90
00:05:46.900 --> 00:05:49.620
there's a level one variant for freighter operations,

91
00:05:50.000 --> 00:05:54.400
and then there's a level four variant with operations for up to 19 people. Um,

92
00:05:54.400 --> 00:05:57.200
in addition, the new regulations do, uh,

93
00:05:57.200 --> 00:06:00.920
have additional maneuvering requirements based on the acrobatic capabilities,

94
00:06:04.010 --> 00:06:04.360
right?

95
00:06:04.360 --> 00:06:08.760
The third major change is the introduction of new certification standards for

96
00:06:08.760 --> 00:06:12.040
loss of control and flight into icing. Uh,

97
00:06:12.040 --> 00:06:14.840
there the intent was to improve general aviation safety.

98
00:06:15.270 --> 00:06:20.120
Inadvertent stalls leading to loss of control was noted by the F AA as

99
00:06:20.120 --> 00:06:23.560
the most common cause of small aircraft fatal accidents. So,

100
00:06:23.560 --> 00:06:25.720
as stated in the part 23 final rule,

101
00:06:26.940 --> 00:06:31.200
the new certification standards for loss of control require the applicant to

102
00:06:31.200 --> 00:06:35.920
quote, use new design approaches and technologies to improve aircraft saw

103
00:06:35.920 --> 00:06:40.200
characteristics and pilot situational awareness to prevent loss of control

104
00:06:40.520 --> 00:06:45.320
accidents. So for new aircraft, these, uh, safety ideas can be implemented,

105
00:06:45.740 --> 00:06:49.550
uh, easily into a new new design. Um,

106
00:06:49.610 --> 00:06:51.470
in revising these standards,

107
00:06:51.470 --> 00:06:54.430
the FAA also look to include requirements for s sld,

108
00:06:54.720 --> 00:06:57.190
mixed phase icing and ICE crystals,

109
00:06:57.490 --> 00:07:00.710
as well as support for the use of ice detectors on part 23.

110
00:07:00.950 --> 00:07:02.750
Airplanes when they previously were, uh,

111
00:07:02.750 --> 00:07:06.820
primarily used on part 25 large aircraft. The, uh,

112
00:07:07.020 --> 00:07:08.060
previous icing regulation,

113
00:07:08.060 --> 00:07:12.300
23 point 1419 was also split into two new requirements.

114
00:07:12.800 --> 00:07:17.100

One for handling qualities in ice detection and the other one for ice protection

115
00:07:17.100 --> 00:07:21.190
systems. Okay,

116
00:07:21.250 --> 00:07:25.790
so the final major change is how to show compliance to these regulations.

117
00:07:26.210 --> 00:07:30.390
Um, previously the regulations themselves had a majority of that information,

118
00:07:30.570 --> 00:07:34.030
so the configurations, the conditions, uh, criteria,

119
00:07:34.850 --> 00:07:39.590
but now the applicant must determine how that compliance is gonna be shown and

120
00:07:39.700 --> 00:07:44.600
gain FAA acceptance per 2310. Uh,

121
00:07:44.600 --> 00:07:49.440
luckily the FAA published an Amendment 64 implementation procedures guide

122
00:07:49.780 --> 00:07:54.440
in June of 2022 that describes the acceptance criteria. Um,

123
00:07:54.440 --> 00:07:59.320
it includes using a detailed design standards or DDS to define the means

124
00:07:59.320 --> 00:08:02.120
of compliance. That implementation guide, uh,

125
00:08:02.120 --> 00:08:05.960
includes templates for how to define all of those means of compliance as well.

126
00:08:06.970 --> 00:08:07.190
Um,

127
00:08:07.190 --> 00:08:10.870
the means of compliance may include specific conditions and configurations that

128
00:08:10.870 --> 00:08:13.730
will be tested for each reg. Uh,

129
00:08:13.730 --> 00:08:18.370
having those means of compliance accepted by the FAA is also intended to reduce

130
00:08:18.390 --> 00:08:19.930
the need for special conditions,

131
00:08:20.060 --> 00:08:22.690
exemptions and equivalent level of safety findings,

132
00:08:22.720 --> 00:08:26.530
because now all of that information is contained within those means of

133
00:08:26.530 --> 00:08:30.040
compliance. Okay.

134
00:08:30.260 --> 00:08:32.920
So how do we determine the means of compliance? Well,

135
00:08:32.920 --> 00:08:37.520
the FAA preferred way is to use consensus standards in the form of

136
00:08:37.830 --> 00:08:38.663
ASTM standards.

137
00:08:39.160 --> 00:08:43.620
So the F FAA publishes their accepted means of compliance in a notification of

138
00:08:43.620 --> 00:08:46.140
availability. NOAA in the federal register,

139
00:08:46.880 --> 00:08:51.540
the NOAA points to a specific version of a collector a T M standard and

140
00:08:51.540 --> 00:08:55.520
includes any other changes specific to the standards for FA acceptance.

141
00:08:56.190 --> 00:08:58.260
These standards are written by the, uh,

142
00:08:58.630 --> 00:09:03.220
committees of industry experts such as many of you here today and are developed,

143
00:09:03.320 --> 00:09:06.740
uh, in cooperation with various civilization aviation authorities.

144
00:09:07.050 --> 00:09:09.300
They're then published by ASTM International.

145
00:09:10.100 --> 00:09:14.800
So this initial list was first published in 2018 and the next

146
00:09:14.800 --> 00:09:17.160
update was made four years later in 2022.

147
00:09:17.450 --> 00:09:20.040
Keith is gonna talk about why that gap is, um,

148
00:09:20.390 --> 00:09:24.440
important and show some specific examples from that NOAA to give you an idea of

149
00:09:24.440 --> 00:09:29.420
how it's laid out. Okay. Um, another option to use, uh,

150
00:09:29.420 --> 00:09:33.860
to show compliance is using previous, um, part 23 amendment levels.

151
00:09:34.410 --> 00:09:38.540
There's a secret de coder ring within that implementation guide that links the

152
00:09:38.540 --> 00:09:43.380

old regulations to the new regulations and kind of shows you how and where to

153
00:09:43.380 --> 00:09:44.700
apply them. Uh,

154
00:09:44.700 --> 00:09:48.460
the guide also has a table that shows where the previous amendment levels are

155
00:09:48.460 --> 00:09:51.660
inadequate to use as a means of compliance for par 20.

156
00:09:51.800 --> 00:09:55.060
I'm sorry for Amendment 64. So for example, uh,

157
00:09:55.060 --> 00:09:59.820
amendment 63 does not contain the appropriate means of compliance for loss of

158
00:09:59.820 --> 00:10:02.820
control, icing, or newer novel designs.

159
00:10:03.080 --> 00:10:07.460
So you must use either ASTM standards or create your own means of compliance for

160
00:10:07.460 --> 00:10:08.820
that. Uh,

161
00:10:08.820 --> 00:10:13.740
so your own means of compliance is the last or the third option for, uh,

162
00:10:13.740 --> 00:10:18.430
proposing compliance to the regulations. That could include using, uh,

163
00:10:18.430 --> 00:10:22.430
small aircraft issues list the sale or other standards like R tca,

164
00:10:22.470 --> 00:10:27.150
A S A E E. Uh, some of you may be familiar with the F I T memo for, uh,

165
00:10:27.370 --> 00:10:30.880
low, uh, low air speed characteristics. Um,

166
00:10:30.980 --> 00:10:35.240
or you can even use different revision levels of the accepted ASTM standards.

167
00:10:35.670 --> 00:10:40.160
This also allows applicants to propose using part 25

168
00:10:40.160 --> 00:10:42.960
requirements as a means of compliance for technology,

169
00:10:43.010 --> 00:10:47.160
which is generally only found in the larger aircraft such as auto throttles and

170
00:10:47.360 --> 00:10:48.240
enhanced vision systems.

171
00:10:50.030 --> 00:10:54.450
So applicants can use one of these options or can use a combination.

172
00:10:55.030 --> 00:10:59.050
Um, additionally guidance material like advisory circulars are still applicable,

173
00:10:59.550 --> 00:11:02.090
but if they conflict with the ISTM standards,

174
00:11:02.190 --> 00:11:06.480
the ISTM standards will take precedence regardless of the method that's used.

175
00:11:06.940 --> 00:11:11.600
The final means of comp compliance will be published in a DDS summary document,

176
00:11:11.930 --> 00:11:15.640
which is listed in the type certificate data sheet and is publicly available.

177
00:11:21.730 --> 00:11:22.170
All right,

178
00:11:22.170 --> 00:11:25.910
so let's switch gears a little bit and talk about the first type certificated

179
00:11:25.910 --> 00:11:29.790
program to use Amendment 64, the Cessna Sky Courier.

180
00:11:30.300 --> 00:11:33.400
The Cessna Sky Courier, as you can see, is a twin engine turbo prop.

181
00:11:33.450 --> 00:11:38.310
We've got Garin G 1000 avionics a max takeoff weight of 19,000

182
00:11:38.310 --> 00:11:39.143
pounds.

183
00:11:39.330 --> 00:11:43.870
Our VMO M M O is 210 knots and 0.4 mach and we have a maximum

184
00:11:44.270 --> 00:11:45.710
altitude of 25,000 feet.

185
00:11:46.410 --> 00:11:51.090
We certified two variants simultaneously of this airplane,

186
00:11:51.270 --> 00:11:52.060
the freighter variant,

187
00:11:52.060 --> 00:11:56.840
which can carry up 6,000 pounds of cargo and a passenger variant which can carry

188
00:11:56.840 --> 00:11:59.760
up to 19 people aerodynamically.

189
00:11:59.850 --> 00:12:03.680
These two airplanes are the same except for windows and escape patches on the

190
00:12:03.680 --> 00:12:04.513
passenger variant.

191
00:12:05.440 --> 00:12:09.170
This Esna Sky Courier was certified in March of 2022,

192
00:12:09.670 --> 00:12:13.810
and we are currently finishing up our first foreign validation with Brazil.

193
00:12:17.680 --> 00:12:19.700
So let's talk about some of the lessons learned.

194
00:12:23.030 --> 00:12:27.450
So the first step in determining your certification requirements is what is your

195
00:12:27.730 --> 00:12:29.170
classification level of the airplane?

196
00:12:29.710 --> 00:12:34.570
Now the classification level is determined by the certification level and the

197
00:12:34.570 --> 00:12:36.090
performance level of the aircraft.

198
00:12:36.800 --> 00:12:40.500
The certification level is the maximum number of passengers that your airplane

199
00:12:40.520 --> 00:12:44.460
can hold. So for us, our passenger variant can hold 19 people,

200
00:12:44.460 --> 00:12:48.780
therefore it's a level four and the freighter variant can hold zero to one

201
00:12:48.780 --> 00:12:52.640
passengers, which means it's a level one airplane. Now,

202
00:12:52.640 --> 00:12:56.320
it should be noted that these certification levels cannot be changed in the

203
00:12:56.320 --> 00:12:59.960
field, which means if I have a freighter variant airplane,

204
00:13:00.240 --> 00:13:02.680
I can't take out the pa, the cargo barrier,

205
00:13:03.060 --> 00:13:06.440
put a couple seats in back and take people for a ride. Likewise,

206
00:13:06.620 --> 00:13:09.160
if I have a freighter variant certified for level four,

207
00:13:09.460 --> 00:13:11.400
but I don't have anyone in the back that day,

208
00:13:11.840 --> 00:13:16.040
I can't suddenly say I'm gonna use level one performance and go about my merry

209
00:13:16.100 --> 00:13:20.830
way. The next area is your performance levels, your maximum speed,

210
00:13:20.830 --> 00:13:24.250
and your maximum altitude. Our MMO is less than 0.6,

211
00:13:24.310 --> 00:13:28.290
so we're a low speed airplane and our ceiling is at 25,000 feet,

212
00:13:28.290 --> 00:13:32.530
which means we're a low altitude airplane. So why is this important?

213
00:13:33.000 --> 00:13:36.690
Your certification and performance levels affect the required testing.

214
00:13:38.320 --> 00:13:43.070
ASTMs generally have the same requirements across all the levels except

215
00:13:43.170 --> 00:13:44.070
for performance,

216
00:13:44.410 --> 00:13:48.270
low speed handling characteristics and handling qualities.

217
00:13:49.610 --> 00:13:49.830
Now,

218
00:13:49.830 --> 00:13:53.830
most of these standards also break down the requirements by the certification

219
00:13:53.830 --> 00:13:57.510
level, performance level, number of engines, and even stall speeds.

220
00:13:58.090 --> 00:14:01.430
And each certification level can require a different amount of scrutiny.

221
00:14:02.720 --> 00:14:06.300
For example, your level one airplane is ideally a smaller airplane.

222
00:14:06.300 --> 00:14:07.460
There's no type rating,

223
00:14:07.690 --> 00:14:11.060
therefore at times it's gonna require a higher level of scrutiny.

224
00:14:12.040 --> 00:14:15.890
Compare this to a level four, which was envisioned as a much larger airplane,

225
00:14:16.010 --> 00:14:19.930
handling a lot more people and requiring some specific training.

226
00:14:21.060 --> 00:14:25.120
So one area where this comes into play is the low speed flight characteristics.

227
00:14:25.680 --> 00:14:30.560
A level one airplane requires more scrutiny to determine that it is not

228
00:14:30.560 --> 00:14:34.480
susceptible to departure characteristics compared to the level four airplane,

229
00:14:34.480 --> 00:14:36.480
which does not have this requirement at all.

230
00:14:37.340 --> 00:14:38.960
So what did this mean for Sky Courier?

231
00:14:39.180 --> 00:14:41.960
It meant that as we went through our certification process,

232
00:14:42.420 --> 00:14:46.400
we had to be cognizant of these various areas and at times we had to do some

233
00:14:46.410 --> 00:14:51.360
extra compliance paperwork to show that our level one airplane complied

234
00:14:51.360 --> 00:14:52.193
with all the rules.

235
00:14:55.950 --> 00:15:00.290
Now the biggest difference that we found between level one and level four is in

236
00:15:00.290 --> 00:15:02.730
the testing and expansion for takeoff performance.

237
00:15:03.360 --> 00:15:08.250
Takeoff performance is controlled by ASTM 31 79 and it

238
00:15:08.250 --> 00:15:09.890
says that for a level one airplane,

239
00:15:10.030 --> 00:15:14.010
you only need to publish go takeoff data to 50 feet.

240
00:15:14.700 --> 00:15:17.390

This is very, very different from a level four airplane,

241
00:15:17.560 --> 00:15:20.950
which requires your standard balance field length takeoff data,

242
00:15:21.240 --> 00:15:24.630
which is your multi engine go, single engine go and accelerate stops.

243
00:15:24.690 --> 00:15:26.950
It also means for a level four airplane,

244
00:15:27.210 --> 00:15:29.590
you need to provide single engine flight path distances.

245
00:15:30.310 --> 00:15:34.850
There's also different requirements for air speed markings in the cockpit. Now,

246
00:15:34.850 --> 00:15:39.490
Textron Aviation only wanted to certify one set of performance data for all of

247
00:15:39.490 --> 00:15:43.850
our variants for initials tc. So therefore we use the level four rules.

248
00:15:45.210 --> 00:15:46.010
In the future,

249
00:15:46.010 --> 00:15:50.150
we could turn around and publish a supplement for our freighter folks with the

250
00:15:50.150 --> 00:15:52.950
level one performance, but we haven't chosen to do that quite yet.

251
00:15:55.890 --> 00:15:58.390
The next lesson we learned was with the means of compliance.

252
00:15:59.170 --> 00:16:01.430
So when you're trying to figure out your means of compliance,

253

00:16:01.430 --> 00:16:04.830
it is very important to start with the latest NOAA in the federal register

254
00:16:04.830 --> 00:16:09.550
system. This NOAA will point you to the accepted ASTM F

255
00:16:09.550 --> 00:16:10.950
32 64,

256
00:16:11.280 --> 00:16:15.950
which is a standard specification for normal category airplane certification.

257
00:16:16.960 --> 00:16:21.700
Now this specification 32 64 will then point you to the ASTMs that

258
00:16:21.760 --> 00:16:24.020
are laid out per each regulation.

259
00:16:24.480 --> 00:16:29.100
And the example you can see up here on the screen is from the 2022 Noah and you

260
00:16:29.100 --> 00:16:32.620
can see how the regulations and the ASTMs get related there.

261
00:16:33.480 --> 00:16:38.060
Now there is a bit of a gray area here because F 32 64

262
00:16:38.260 --> 00:16:43.180
revision 21 is what is set out in the 2022

263
00:16:43.330 --> 00:16:46.740
noaa. However, as of February, this past February,

264
00:16:47.530 --> 00:16:49.780
ASTM released revision 23,

265
00:16:50.520 --> 00:16:54.060
but there's not been a new NOAH to say that the FAA accepts that revision yet.

266
00:16:54.520 --> 00:16:58.060
So this is another one of those areas where you need to talk with your ACO to

267
00:16:58.060 --> 00:17:01.740
make sure everyone's on the same page using the same regulations.

268
00:17:03.490 --> 00:17:08.030
So let's dig into F 32 64 a little bit and how the ASTM specifies these

269
00:17:08.030 --> 00:17:11.130
accepted means of compliance. Like I said,

270
00:17:11.130 --> 00:17:13.210
32 64 you can see on there,

271
00:17:13.260 --> 00:17:16.850
links the rigs for 23 21 50,

272
00:17:16.850 --> 00:17:21.210
which is for stalls to ASTM 31 80 dash 19,

273
00:17:21.510 --> 00:17:25.770
the standard specification for low speed flight characteristics. However,

274
00:17:26.110 --> 00:17:27.290
as sometimes happens,

275
00:17:27.950 --> 00:17:32.010
the NOAH then calls for changes before the FAA will actually accept it.

276
00:17:32.950 --> 00:17:33.783
In this case,

277
00:17:34.960 --> 00:17:37.980
and I'm gonna have to read this because it gets a bit confusing,

278
00:17:38.760 --> 00:17:43.420
the FAA does not universally accept 31 80 19 due to

279
00:17:43.420 --> 00:17:45.860
inexperience with alternative two. Now,

280
00:17:45.860 --> 00:17:50.240
alternative two is a novel method of departure resistance single engine aircraft

281
00:17:51.220 --> 00:17:55.440
the FAA previously and continues to accept 31 80 revision 16.

282
00:17:56.320 --> 00:18:00.500
The additional information column says applicants are encouraged to consider

283
00:18:00.500 --> 00:18:02.220
proposing 31 80 19,

284
00:18:02.540 --> 00:18:06.620
particularly alternative to for development of their means of compliance for low

285
00:18:06.620 --> 00:18:11.140
speed handling qualities, or may obtain FAA acceptance of a different method.

286
00:18:12.460 --> 00:18:14.660
Confused cuz we definitely were.

287
00:18:15.990 --> 00:18:18.560
Basically what the FAA is saying here is that hey,

288
00:18:18.620 --> 00:18:21.080
we are okay with revision 19 if it applies.

289
00:18:21.800 --> 00:18:24.840
Revision 16 is well is all good and well too.

290
00:18:24.900 --> 00:18:29.360
But please if you would propose alternative to, cuz we wanna know how it works,

291

00:18:30.140 --> 00:18:32.720
but proposing something else is completely fine as well.

292
00:18:34.010 --> 00:18:38.350
The lesson here is you have to review all your available resources when you're

293
00:18:38.350 --> 00:18:41.750
selecting your means of compliance and be aware for any of these contradictions

294
00:18:41.750 --> 00:18:43.550
that may be hanging out in there.

295
00:18:44.210 --> 00:18:48.750
The next lesson is if you are in a large corporation like Textron Aviation,

296
00:18:49.370 --> 00:18:51.310
you have to coordinate early and often.

297
00:18:52.130 --> 00:18:56.540
It's very important that each one of your groups is on the same page as far as

298
00:18:56.540 --> 00:18:58.580
what revision of the ASTM you're using.

299
00:18:59.960 --> 00:19:03.930
This also means that you need to have early and often coordination with the aco.

300
00:19:05.750 --> 00:19:08.590
Remember the ACO is also learning amendment 64.

301
00:19:08.640 --> 00:19:11.870
These ASTMs are being updated all the time.

302
00:19:12.290 --> 00:19:16.750
And while you may be the resident expert on the revision of the a s TM you're

303

00:19:16.750 --> 00:19:17.583
using for your project,

304
00:19:17.970 --> 00:19:22.590
the local ACO might be keeping up with several revisions of an A tm,

305
00:19:23.050 --> 00:19:24.050
you know,

306
00:19:24.050 --> 00:19:28.730
this early and often coordination also primes them for the inevitable cert plan

307
00:19:28.730 --> 00:19:32.740
and test plan changes that are coming. Now, subpart B, honestly,

308
00:19:32.740 --> 00:19:36.100
it matches up really well with the new regs and the new ASTMs,

309
00:19:36.480 --> 00:19:40.140
but the same can't really be said for the rest of the subparts. Uh,

310
00:19:40.560 --> 00:19:41.620
Cessna Sky Courier,

311
00:19:41.720 --> 00:19:46.660
we had several cert plan and test plan revisions along the way due

312
00:19:46.660 --> 00:19:51.220
to systems UMS rereading their ASTM for the third or fourth time and realizing,

313
00:19:51.560 --> 00:19:52.393
oh no wait,

314
00:19:52.500 --> 00:19:56.420
I actually do need a flight test method of compliance to be able to show

315
00:19:56.420 --> 00:19:59.420
compliance to this regulation, which forces those updates.

316

00:20:03.100 --> 00:20:06.400
Now let's take a quick look at the individual standards. Uh,

317
00:20:06.400 --> 00:20:10.160
the list you can see on the screen is definitely not all inclusive,

318
00:20:10.820 --> 00:20:14.600
but as you can see, the ASTMs are based on individual subjects, propulsion,

319
00:20:14.600 --> 00:20:18.440
handling qualities, performance. They're each given their own rev levels,

320
00:20:18.490 --> 00:20:21.080
which is the dash number after the ASTM number,

321
00:20:21.140 --> 00:20:23.400
and this corresponds to the year published.

322
00:20:23.700 --> 00:20:25.840
If there's an ABC or a letter after it,

323
00:20:25.870 --> 00:20:28.800
that just means they needed to publish more than one revision that year.

324
00:20:29.850 --> 00:20:33.630
So now that you've determined what rev level of your ASTM you want,

325
00:20:33.700 --> 00:20:38.150
then you have to figure out what paragraphs inside that ASTM actually apply to

326
00:20:38.150 --> 00:20:41.720
your airplane. As I said before, these regulation,

327
00:20:41.920 --> 00:20:45.720
these ASTMs can be broken down by performance levels, certification levels,

328
00:20:45.980 --> 00:20:48.080
engine number of engines, stall speeds.

329
00:20:48.460 --> 00:20:52.280
So it really becomes helpful to go through and highlight the portions that

330
00:20:52.960 --> 00:20:56.120
actually apply to your airplane or go through and redact the parts that don't

331
00:20:56.120 --> 00:21:00.540
apply to your aircraft at all. And even sometimes a flow chart becomes handy,

332
00:21:00.550 --> 00:21:02.700
especially when you start looking at, you know,

333
00:21:02.940 --> 00:21:05.260
a spin program or a stall characteristics.

334
00:21:05.260 --> 00:21:08.900
Having that flow chart to figure out when you can move on and when you've passed

335
00:21:08.900 --> 00:21:11.950
all your requirements can be really helpful. Finally,

336
00:21:12.170 --> 00:21:15.630
you should note that ASTM standards are copyrighted.

337
00:21:16.290 --> 00:21:20.870
So that means that you have to talk with ASTM International early on and get

338
00:21:20.870 --> 00:21:24.830
permission from them to quote these ASTM standards in your test plans,

339
00:21:25.130 --> 00:21:28.030
in your cert plans, in your certification reports.

340
00:21:28.940 --> 00:21:31.520
It also means that when you're working with your suppliers,

341

00:21:31.900 --> 00:21:35.360
you can't just hand them an ASTM and say, Hey, this is what I'm using.

342
00:21:35.540 --> 00:21:37.640
Or when you're talking with the aco, the same thing.

343
00:21:37.640 --> 00:21:40.960
You can't hand them the ASTM or email it to 'em and say, oh yeah,

344
00:21:40.960 --> 00:21:42.560
we're on paragraph 3.4.

345
00:21:43.480 --> 00:21:47.960
Everyone needs their own subscription to A S T M to be able to follow along with

346
00:21:47.960 --> 00:21:48.793
you.

347
00:21:51.980 --> 00:21:55.760
The Cessna Sky Courier was definitely a learning opportunity for both Textron

348
00:21:56.000 --> 00:21:58.600
Aviation and the Wichita ACO o You know,

349
00:21:58.600 --> 00:22:03.040
amendment 64 is supposed to be easier and in a lot of ways it is. However,

350
00:22:03.050 --> 00:22:05.840
there are definitely some kinks still getting worked out.

351
00:22:06.610 --> 00:22:10.080
There is the requirement to publish your means of compliance at the end of

352
00:22:10.080 --> 00:22:10.913
certification,

353
00:22:11.050 --> 00:22:15.200

which means there's much more upfront research that has to happen. However,

354
00:22:15.250 --> 00:22:20.240
these new consistent consensus standards do provide more flexibility

355
00:22:20.300 --> 00:22:24.320
and the opportunity for advanced technology in your aircrafts. With that,

356
00:22:24.840 --> 00:22:28.880
I hope this program helped you out and we'll take any questions.

357
00:22:43.490 --> 00:22:46.060
Yeah, thank you for that presentation. Uh, my question is, uh,

358
00:22:46.680 --> 00:22:51.630
if you considered using any of the legacy rules as a means of

359
00:22:51.630 --> 00:22:54.510
compliance for, uh, either the level one or level four aircraft,

360
00:22:56.370 --> 00:22:58.870
why or why and if and if you did or didn't, why or why not?

361
00:23:00.250 --> 00:23:04.270
Uh, I don't. From the very beginning, we, uh,

362
00:23:04.270 --> 00:23:06.110
just stuck with using as s T M standards.

363
00:23:06.110 --> 00:23:09.670
That was a decision that the engineering department as a whole made. Uh,

364
00:23:09.670 --> 00:23:12.910
we do have other projects going on where they are using the previous amendment

365
00:23:12.910 --> 00:23:17.870
levels except for stalls and icing where they do have to use the new,

366
00:23:17.970 --> 00:23:21.590

new items. Um, so it was just a program decision from the beginning.

367
00:23:22.900 --> 00:23:25.670
Yeah. And part of that is when, uh,

368
00:23:25.810 --> 00:23:30.190
sky Carrier made initial initial application to the F a A

369
00:23:30.580 --> 00:23:33.830
Amendment 64 was already out there.

370
00:23:34.010 --> 00:23:37.790
And so we just decided to jump in with both feet and go with all the A S T M

371
00:23:37.950 --> 00:23:38.783
standards.

372
00:23:48.110 --> 00:23:49.400
I'll, I'll make a comment. I,

373
00:23:49.600 --> 00:23:54.200
I was in the f AA for 18 years and through this transition and I want to thank

374
00:23:54.710 --> 00:23:57.320
both Keith and Chin and that was probably the,

375
00:23:57.380 --> 00:24:01.960
the best tutorial I've seen on the actual how do it work that I've seen even

376
00:24:01.960 --> 00:24:04.160
having lived through it. Thank you.

377
00:24:12.300 --> 00:24:14.770
So Keith and Shannon, thank you so much. Thank you.

378
00:24:15.210 --> 00:24:17.530
Excellent presentation really is it much appreciated.

379

00:24:17.680 --> 00:24:19.010
Know your lightsabers are available.