Date : 13 May 2009

TO: Jim Struhsaker, Zoe Keliher

FROM: Carson NTSB Operations Party Member, Sean Moretz

RE: Operations Factual Report, LAX08PA259

Carson group members received the extensive factual report from Zoe Keliher on 7 May 09. Her attached email solicits comments from group members by 20 May 09. With the large volume of material involved, we can appreciate the amount of work entailed in compiling the Operations factual report.

We have discovered a number of factual errors in the report that affect its validity, and we offer this response with the intent of making sure the report is as correct as possible and that the NTSB team has a true basis for analysis. We are sure this is the common goal of all party members. It is not truly comprehensive, because we have none of the attachments referenced in the report. We have requested the attachments, but have been informed that those will not be supplied at this time.

We have listed informational corrections in order by page number; some are simple records corrections, others are very important to deriving a true factual report. Items requiring more detailed explanation have their own subsection (2-Temperature Section, 3-Aircraft Weight Section).

1. ***Page by Page Informational Corrections***

P.1, Summary – the term passengers is used to describe the firefighters being transported by HT-766, which is incorrect. The helicopter was a public aircraft as defined by 49 USC 40102 and 40125, and as indicated in the opening paragraph. These laws prohibit the carrying of “passengers” and define occupants as either “crewmembers” or “qualified non-crewmembers”. The correct terminology should be used here and throughout the report. Additional reference, FAA Advisory Circular AC -00.1-1.

P. 2, 1st paragraph – states that the helicopter was operated under contract by CHSI. This is not correct, N612AZ was contracted to USFS by CHI, not CHSI. This needs to be clarified throughout the report. Although a lease agreement for the aircraft existed between CHI and CHSI for purposes of 135 operations, N612AZ was not being operated under part 135 or by CHSI during performance of this contract.

P.3 , 1.1 a – "….PIC a required recurrent check for the S-61."- This is not quite correct, the pilots were already USFS carded and had Part 135 qualifications. There is no established standard for helitack authorization from the USFS , and it is not a yearly (recurrent) requirement to do a checkride for this authorization. USFS has the authority to put inspector pilots on board to monitor pilots anytime, but this was not a recurrent ride.

P. 4 – 2nd paragraph – "…..as neither of the pilots had met the checkpilot before." This is incorrect. Ramage had given Bill Coultas (copilot) his initial firefighting checkride in an S61 in 2005. Our understanding is that the PIC (Schwanenberg) had also met Ramage previous to this day.

P.5 – last sentence makes reference to 44 people. - This conflicts with the load chart and manifests made by USFS displayed later in the report, which show 4 loads of 10 people and one load of 9 people, as well as other comments about 4 trips of 10 or 5 trips of 8 people, which would be 49 and 40 people, respectively. These numbers should be reconciled. The report says there were 44 people on the mountain to be moved. 766 then brought in an additional 5 helitack crew members to assist with the transportation, making a total of 49 to be transported out to H-36.

P.7,3rd paragraph- "With the helicopter about 10 to 15 feet agl, the pilots executed a go-around. Medium helicopters were called in to perform water drops on the LZ as a dust abatement procedure." – This is incorrect. The CVR and sky-connect data both show that the aircraft did briefly land on the heli-pad, and then lifted off and went around. Medium helicopters did do dust abatement, but not until after the 2nd landing at H44 by the S61. The chronology is improper.

P. 8, 2nd paragraph- "The helicopter departed at 1814 with a quartering headwind of 3 to 5 knots….." The weather condition table Figure 20 on P.40 of the report lists a 5 WNW wind, which would be a tailwind, not a headwind. One of these is wrong. For more detailed information, see our section on Conflicts with Wind Data.

P.8, 2nd paragraph- " referring to gas generator speed (Ng) gauge……." - This is incorrect. The co-pilot does not call out Ng here, he is referring to Torque.

P.9 – The footnote 18 states that "the copilot does not announce Ng, as heard on the departures from H-44. " The author is confusing Ng with Torque. The pilots are calling out

Torque during the departures, not Ng, which is an important distinction. This confusion is referenced elsewhere in the report also and should be corrected.

P.10, top paragraph- " Nr began a slow droop from 108 % to 101 percent over 35 seconds." - The Nr was 107 to 107.5% on this takeoff, not 108 %. It is important because there is an observed degradation in the flat pitch setting Nr on each successive takeoff from H44 as evidenced by the CVR spectrum data. This is a physical throttle stop for flat pitch RPM and should be the same each time, and between 107 to 109 %. The fact that the CVR shows flat pitch RPM degradation on each successive takeoff of this setting (which should be very constant) is an indicator that there is an incremental power loss as time goes on that day.

P.10, footnote 20 – " this statement is incorrect, as the total capacity for both tanks is 384.4 gallons……" - Carson standard procedure when filling the forward and aft tanks is to shut off fueling at 2500 lbs, rather than trying to fill to the very top of the tanks. This is done so that if there is a float malfunction the fuel cell will not overfill and rupture. 1250 lbs. per side is the standard for filling the two tanks, and when the co-pilot references they will have 2500 lbs of fuel, he is exactly right according to the standard procedure followed by our crews. This footnote should be removed.

P.11, 2nd paragraph- "….commented that the transmission oil gauge was at the edge of the normal operation (green) arc, indicating high temperatures." This is incorrect. The copilot never identifies what gauge he is referring to and actually says that the needle was "at the bottom of the green" and comments that pressure is a little low and temp a little high. The PIC comments that it is normal to be at the bottom of the green.

P.11 d – The footnote 24 states that it is unknown what altitude and location this reading was taken and therefore this temperature is not used. Although it is blanked out, it is assumed this is when the copilot reads the OAT as 20 degrees c. Cross referencing the CVR data and the Skyconnect data, we actually have a very good idea of where the reading was. Additionally, while the aircraft is on the ground at H44 the copilot states the temperature is 12 to 13 degrees cooler than the 32 deg. planning temp., which would be 20 deg. C. This is certainly a more accurate temperature than an extrapolated figure calculated from a location many miles away and it should be used in this report. See Temperature Section for more detailed information.

P.12, 1st paragraph- "……at 1941:02 he called out the Ng was increasing……" - This is incorrect. He is calling out torque, not Ng, and when he calls out 90 and 103 percent, he is calling out 90 % torque and 103 % Nr (calling out "90 and 103" is typical parlance in this instance).

"About 9 seconds later he informed the PIC that torque had decreased to 100 percent…." - This is incorrect. He is calling out Nr, not Torque here.

P. 12 – "during this time, the Nr began a slow droop from 107 percent to 91 percent….." This is incorrect. The top Nr was 106 to 106.5 % on this takeoff, which was a degradation from the

first Nr on the first takeoff of 108-108.5%, and 107% on the second takeoff. This is significant because this number should not change from takeoff to takeoff.

P.12-13- "The flight path continued toward an area of lower trees and the helicopter stayed at the same altitude." - This is not right. The helicopter lifted into a hover, then proceeded forward over the trees and then began dropping rapidly. We know this because the first trees at the edge of the helipad were taller and intact and the first cut tree was directly behind them. The aircraft had to clear the first trees and then began a rapid descent, clipping trees as it came down. It is an important distinction.

P. 15, 3rd paragraph- " He was not carded for fire suppression (helitack), or flying the helicopter from helibase to a fire, helispot to helispot, or on the fire line." - This is partially incorrect. It is true that he was not carded for helitack until the ride with Ramage, but there is no carding process or check ride for flying to or from any specific location on a fire. The section regarding not being carded for flying the helicopter from helibase to a fire, or helispot to helispot, or on the fire line is not applicable.

P. 16 ,2nd paragraph- "CHSI stated that they notified their POI in January 2008 of the PIC's situation." - This is not correct, CHSI first notified the POI at the Portland FSDO about the PIC rehab situation in November 07, as soon as CHSI learned of the situation.

P. 16, 1.3 b – says the copilot's medical was issued March 12, 2008. This is incorrect; it was issued May 12, 2008.

P. 17,1st paragraph – listing the pilot's qualifications, it omits that the copilot was indeed carded for fire suppression (helitack) and reconnaissance and surveillance on his current card. This should be added to his approval list.

P.18 – " This was the checkpilot's first time performing an evaluation in an S-61; he had no experience in the S-61." And in the next paragraph, it states "The accident flight was his first evaluation flight in an S-61." – Neither of these statements is true. Our records show the USFS checkpilot had given S-61 checkrides and carded at least two Carson pilots less than two months prior to the accident. In addition, he gave the copilot his initial carding and checkride for USFS firefighting in an S-61 on 9/30/2005. In fact, he had been in the S61 several times previously. It is not true that he had no experience in the S61, and these statements should be changed to reflect these facts.

P. 19, footnote 35 – "….the helicopter had accumulated about an additional 2 hours of operating time prior to the accident……" - This is incorrect. The aircraft flew approximately 4.3 hours that day, two hours water dropping and about 2.3 hours in the afternoon doing helitack work prior to the accident.

P. 21, bottom footnote- “Power assurance checks are conducted daily.” This is not necessarily true. As noted in the top of the page, the USFS requires a PAC every 10 hours. Although power checks can be done daily, there is no flight manual or USFS requirement to do so.

P. 22, 2nd paragraph- “…….or 2.0 hours since the last power check.” Also footnote 41 refers to 2.0 hours since power check. This is incorrect. The aircraft flew approximately 4.3 hours on the day of the accident, so these numbers should be revised.

P. 22, 1.6 a – CHSI 14 CFR Part 135 Operations Specifications – this section does not apply to this operation. Under contract, the USFS explicitly has legal operational control of the aircraft under public use laws, and CHSI part 135 Op Specs do not apply to USFS operations, other than an operator needs to be in possession of valid Op Specs to be contracted. This is the position of the USFS and the FAA. This section should be removed.

P. 25-26, passenger manifests- There is confusion in the report regarding passengers and manifests. The report early on states there were 44 people to be removed from H44, but these manifests show 4 loads of 10 people and one load of 9 people, or 49 people. Other discussions center around 4 loads of 10 people. This needs to be reconciled; are there additional helitack crew, and if so, how would they get down ?

P. 28, 1st and 2nd paragraph – reference is made to the CHC (Canadian Helicopter Company) weighings and comparisons are made to the CHSI weighings. This wording is misleading. The reality is that the comparison is being made between a Carson weighing done in August 2007, and a CHC chart A and subsequent chart C based on an original weighing done by CHC in 2003. The aircraft had not been weighed by CHC since 2003, only chart C additions were notated. If we are going to compare weights of the aircraft it is very important to note you are comparing actual weighings that are more than 4 years apart. Additionally, Carson has found some addition information indicating there may have been another weighing done on 6 August 07 that shows the aircraft at 12491 lbs. Please see Aircraft Weight Section.

P. 29 – This paragraph is incorrect. The chart B that is referenced here does not indicate that the aircraft was weighed in Grants Pass, only that the form was prepared by Levi Phillips. As stated in the footnote (and should be made clear in the main text body), weight data from Perkasie was transferred to a standardized Part 135 weight and balance form in order to be submitted as part of a standardized proposal package for the USFS bid proposals, and this is not unusual. CHSI has never represented that the aircraft was weighed on roll-on scales in Grants Pass, which was not physically possible. In fact, this aircraft was never at the Grants Pass facility in the time that Carson owned the aircraft, and we have never maintained otherwise. This paragraph should either be extensively modified or deleted.

P.40- We have extensive comments on the temperature and OAT section contained on these pages, including inconsistencies with the wind data. The footnote 69 contains several errors and inconsistencies with supplied data. Please see the Temperature Section below.

P.41, footnote 72- Reference is made in several places here to Class A and B rotorcraft loads. This is incorrect. The correct term is Category A and Category B loads, which refer to passenger and internal cargo FAR part 135 loads. Class A,B,C,D loads are completely different from Category A and Category B load limitations, and refer to FAR part 133 loads.

P.43 b – " This email was not provided in the subpoenaed documentation, nor did CHSI provide this information to the Safety Board." - This is a misleading statement. CHSI has been and still is complying fully with the NTSB request for documents. The email in question was not produced because we were not required initially – but only subject to further request – to search and produce emails from those CHSI employees whose computer hard drives had not been previously copied, including the computer of CHSI's Director of Operations, whose computer does contain a copy of the email in question. This production limitation was proposed because we believed that the hard drives already copied would yield all relevant emails. Subsequent to learning of this oversight, we provided, through our attorneys, a copy of the email in question and other documents to the NTSB. We have made every attempt to comply with the NTSB requests and have delivered almost 20,000 pages of documents to the NTSB without censoring or holding back any information. This sentence incorrectly characterizes this issue and should be removed.

P. 45, footnote 75- " During the investigation, the Vice President originally stated that the mislabeled chart originated from CHI. Later he opined that an outside source had switched the charts in an act of sabotage." - This statement combines two separate meanings and is somewhat misleading. 1) The original statement that the chart originated from CHI was in the context of the fact that ALL flight supplements regarding composite blades or performance originate from CHI and are sent to CHSI in Grants Pass after FAA approval. It was not intended or stated to mean that CHI had sent a particular mislabeled chart to CHSI. 2) It is true that there was some early speculation about whether this chart could have been substituted by a recently terminated disgruntled employee that had already threatened various kinds of retribution. However, this was just one of several theories mentioned as Carson began trying to understand how the mislabeled chart was propagated into our flight manuals. This sentence should be deleted from the factual report, because it leaves a false impression and has no bearing on the facts.

P. 46, Figure 7- "…..the chart derives maximum gross weight." This is not correct. These are not max. gross weight limitations, see next comment.

P. 47, top of page- "…..the maximum gross weight is ….." - This is incorrect. These are performance chart figures for expected performance with 5 minute power, they are not maximum gross weight limitations, which is an important distinction.

P. 46-47 chart discussion- it should be made clear somewhere in this discussion that these figures are expected performance for minimum specification engines.

P. 47, figure 24 – It appears the description under this figure has the colors reversed between the FAA and CHI numbers.

P. 48 3rd paragraph- " ……accumulate about 1400 hours annually." - This statement needs clarification that this is an approximate fleet average per aircraft per year, not a cumulative total for the Carson fleet.

P. 49, last paragraph – "….designated by the operator to act as a second tier of operational control." - This is not technically true, or should be clarified. Operational Control is a legally defined FAA term, and the USFS has Operational Control on public use contracts(and they are very adamant about that). There is no second tier of operational control as legally defined. It is true that the PIC has final authority as to whether the mission will be flown and weights carried, but this is not the same as operational control of the aircraft, it is a flight safety issue. This should be revised, as well as the sentence at the end of the paragraph on the next page.

P.51 , 1st paragraph- "…loading and unloading of passengers, may be conducted while the engine was at flight idle with both main and tail rotors turning." - This is incorrect. Carson standard procedure is that the aircraft will be at 100 % rotor RPM at all times during passenger loading and unloading when the aircraft is running, not flight idle. This is true anytime the aircraft is running on the ground.

P. 54, Contracts, paragraphs 2 and 5- "CHSI received 7……" and "CHSI received 5 awards….." - This is incorrect. CHI was the contracted party for both sets of these contracts.

P.55, CHI and USFS - " Initially the USFS did not have interest in utilizing type 1 helicopters for passenger transport." This is not true. On at least two previous occasions, the USFS let contracts for passenger transport with type 1 helicopters; ERA helicopters had a contract to move crews with a Eurocopter SuperPuma in southern California, and for some years Pacific Helicopters provided an S-61 helicopter on contract for helitack crew transport in Arroyo Grande, California.

2. Temperature Section

A) Actual vs. Extrapolated readings

It is noted twice in this report that the CVR temperatures as called by the pilot for the accident takeoff are not used since exact location and accuracy is not determined. Instead, averaged meteorological data taken from several miles away is used (at 23 deg. C). This is not a valid substitute for the CVR data. However, we do have a very good idea of location as he reads the temperature the first time.

1) We have a good fix of his proximity to the H44 pad when he reads temperature by cross referencing the CVR timeplot and the Sky Connect data. At 19:30:33 the helitack person on the ground informs the pilots that winds are the same as before, out of the south at 3 to 5 knots. At 19:33:26, the aircraft passes through 6300 ft., only 355 feet in elevation above the helispot. At 19:34:52 (more than 1 minute later and certainly lower), the aircraft is on short final bearing and the co-pilot calls temperature as 20 deg.C. Less than 40 seconds later, the next Skyconnect data point shows them already on the ground at 5945 ft. elevation. From this data we know that when the temperature is read, they are on short final very close to H44, descending and certainly well less than 300 ft. above the helispot location. The Standard Adiabatic Cooling rate as per NTSB is 3 deg.C per 1000 ft. of elevation. This OAT temperature is nearly certain to be less than 1 deg. C different than at H44 itself when read by the copilot.
2) At 19:39:18, four minutes after they have landed at H44, the copilot is heard to be carefully considering the temperature as between 12 to 13 deg. C cooler than the 32 deg. C mission planning temperature (or 19 to 20 deg.C). The OAT gauge is directly in his right line of sight near his head and he is certain to be reading this from the gauge.
3) The Outside Air Temperature Gauge (OAT or Free Air) was checked specifically for the FAA Hoist Supplement Flight Testing conducted in December 2007. On July 28, 2008 the Free Air (OAT) gauge was inspected and checked during a phase IV inspection by mechanic Tim Obrien, less than 10 days before the accident. (See attached maintenance log inspection sheet, which is part of the aircraft records in NTSB possession). The OAT gauge is accurate to 1 deg. C when in calibration.
4) The meteorological data used in place of the OAT reading is an average of temperature extrapolated from a weather station many miles away and adjusted for elevation. Any person experienced in mountainous terrain knows that temperatures can vary widely just from one side of a ridgeline to the other, and this area is some of the most rugged, steep and topographically varying wilderness terrain in the entire state. In addition, there was a 60,000 acre fire burning in close proximity to the helispot, which in combination with steep mountains can have a drastic affect on localized temperatures and wind currents (both up and down). Assuming similar temperature trends at such

widely disparate locations in these conditions cannot be as accurate as a temperature reading taken at the site.

5) If the meteorological data from Backbone are going to be used, then the data needs to be corrected. According to the weather conditions sent to us by Ms. Keliher on 18 Sept 08 (see attached email), the following conditions applied:

"The helicopter manager's interview and AFF records indicated the pilot made a low pass at the helispot at 1725, during the first leg of the passenger transport and noted 28 degrees C. as the temperature. The temperature reported at Backbone was 30 degrees C. at 1700, and 27.7 degrees C. at 1800. These indications would be consistent with temperatures at H-44 in the range of 25 – 28 degrees C. at the time of the low pass at 1725. The temperature reported at Backbone was 30 degrees C. at 1700, and 27.7 degrees C. at 1800. These indications would be consistent with temperatures at H-44 in the range of 25 – 28 degrees C. at the time of the low pass at 1725. Temperatures were cooling from after 1600 and between 1900 and 2000, temperatures at Backbone dropped from 25 degrees to 22 degrees. Using a standard lapse rate of 5.5 degrees Fahrenheit per 1000 ft elevation, it is estimated that temperatures at the heli-spot at 1930 that evening were around 70 degrees F (21 degrees C)."

This information indicates that the OAT gauge was reading very similarly to the Met. Data available during the first pass. The lapse rate calculation is not quite right; but using the Met. data from Backbone:
Utilizing this data and calculating the lapse rate at 5.5 deg.F as listed:
Backbone – (average between 25-22 deg) 23.5 deg.C, 4,700 ft. elevation
H44- 5945 ft. elevation
1249 ft. difference, 6.9 deg. F lapse difference
This results in an H44 corrected temperature of 19.7 deg.C, virtually exactly what the copilot reads on the CVR.

In summary, NTSB has a choice between:

I) A temperature that is read twice by a pilot on the CVR with 6000 hrs. of military and civilian experience at or so near the actual helispot that it makes no statistical difference, reading an OAT gauge that was checked less than 10 days before the accident and is located right next to the co-pilot's head, and matches the known Met. Data on a previous pass, or

II) A temperature that is artificially calculated based on temperature readings taken tens of miles away at weather points of unknown exposure or accuracy and then averaged for the area and altitude; such an averaged reading does not take into account localized differences in heating or cooling from extreme mountainous terrain, the fire, sunlight exposure, wind cooling, etc.

III) If they choose to use all averaged meteorological data from Backbone, then they should be using **19.7 deg. C.**

We do not understand why NTSB is choosing 23 deg. C, when it is apparent that the 19-20 deg. C reading from the CVR is undoubtedly more accurate. Utilizing an averaged extrapolated temperature from other remote locations is problematic and is a poor substitute for an actual local temperature reading from a trained observer. In any case, the correct extrapolated temperature is still 20 deg.C. This will have a serious impact on the performance hover study figures and is very important, and we have raised this issue in previous meetings. The ambient temperature at the H44 helispot at the time of the accident liftoff should be correctly listed as **20 degrees C; to do otherwise is to ignore the best information available, which is not the goal of the team or the factual report.**

B) Conflicts within Temperature Tables and Wind Data

The table listed in the report regarding conditions (Figure 20) on P.39-40 shows a temperature for the first H44 takeoff as 29 deg. C. This conflicted with the table we were given in October by the group chairman and we requested the data from which Figure 20 is derived on 13 May. The table sent to us by the group chairman shows the temperature at H44 on the 1st takeoff to be 34 deg. C, which matches the data we have from October. Where did the 29 deg.C number come from ? Was this the reading from the CVR ? Is 34 deg.C the extrapolated meteorological temperature reading ? This needs to be clarified, since it has a direct bearing on the performance calculations and is crucial in comparing apples to apples in the temperature data.

The report lists winds calm at H44 during the accident takeoff. On the CVR at the 19:30:33 point, the ground helitack manager can be heard telling the pilots that winds are the same as the previous takeoff, 3-5 knots out of the south. This is a verbal report from a trained professional at the location less than 4 minutes before the aircraft is on the ground at H44. We have also enclosed 2 digital pictures (see attached file) that were taken less than 20 minutes after the accident, and the smoke plume from the fire can clearly be seen blowing upslope from south to north. In the copilot interview, he clearly recalls that there was wind blowing upslope from the south.

The wind for the first H44 takeoff is listed in both the Factual Report weather table and the weather table sent to us by Ms.Keliher as 5 knots WNW. The report on P. 8 says they departed with a quartering headwind of 3-5 knots. The departure path of the aircraft is 155 degrees, which is nearly straight SE. If the wind is WNW as listed, it would be 290 degrees, which is a tailwind, not a headwind. This information is being used to calculate payload and performance, and this must be clarified. If the wind is 5 WNW, then this will certainly affect the payload calculations on the first takeoff. If it is an error propagated throughout the report tables and it was a headwind, then other questions arise.

Why is NTSB listing winds as calm on the accident takeoff, but with 5 knot winds on the 1st takeoff ? Where did that wind information originate ? The meteorological forecast was for

winds to increase in the evening hours, and they did increase at Backbone with winds at 6-9 MPH with gusts of 12-13 mph (see weather in attached email of 18 Sep 08). A 5 knot wind makes a significant difference in the performance of the aircraft, and discounting a CVR-recorded professional helitak manager describing the wind at 3-5 knots at the accident takeoff does not make sense to us. This requires clarification and correction.

3. Aircraft Weight Section

N612AZ was utilized for multiple missions and configurations in the 13 months that Carson owned the aircraft. It was used for hurricane rescue relief work in Texas, FAA hoist supplement verification flight testing, water dropping/firefighting in Florida, firefighting and helitack missions in the western US, and configured for demonstration/static display in the eastern US. As such, the configuration changed several times and the aircraft was weighed at least 4 times in less than 12 months, which is very unusual for a large helicopter (for example, the previous owner, CHC, weighed the aircraft once in 4 years). This generated multiple Chart B weighing sheets, and chart A and chart C entries. Carson has been made aware of and has acknowledged that there were errors and/or conflicts in some of the entries, and we have extensively modified our weighing procedures and our General Maintenance Manual procedures to reflect increased strict control to avoid mistakes in weighing or in annotation in the future.

a. 04 January 08 weighing

The NTSB author has arrived at an aircraft weight by starting from a chart C generated on 25 March 08 which is based on notations added to a weighing done on 4 January 08 in Perkasie. There are some errors by both Carson and NTSB in arriving at this weight. However, the derived NTSB weight is not believable for this aircraft.

The original weighing on 4 Jan 08 shows a weight of 12,328 lbs. The accompanying chart A does not show the installation of seats, hoist or bubble windows in this weight. This was an error in annotation for the chart A. The chart A from the August weighing show that the aircraft had a total of 13 seats installed at a total weight of 273 lbs. (5 singles @ 25 lbs, 4 doubles at 37 lbs.). There is no maintenance entry to show that these seats were removed until the following spring 08. This aircraft was utilized for rescue hoist FAA supplement testing from December 20th to the 27th, and Mr. Carson personally strongly recalls seeing that the seats, hoist and bubble windows were on the aircraft for this testing and the subsequent weighing six days later.

- The aircraft was used for Goodrich Hoist STC testing in late December. The work orders and maintenance logs show that the hoist assembly was installed on 12/20, and the 11,000 lb. cargo hook assembly was installed on 12/27. Mr. Manogue is also certain that there were several rows of seats in the aircraft, both during testing and in the 4

january weighing. One issue is that the Chart A was prepared by a different technician than the one that physically weighed the aircraft. This procedural oversight has since been corrected and changes have been instituted in our General Weighing Procedures.

Cargo hook assembly – 75 lbs.
Goodrich Hoist - 135 lbs.
13 seats- 273 lbs.
Bubble Windows- 36 lbs.
Total discrepancy of 519 lbs. of weight not correctly noted on chart a. This would result in a minimum corrected aircraft weight on 4 january of 11,809 lbs.

Our fleet average for all our longbody S61 aircraft configured for IA firefighting but without the tank and snorkel is 11,960 lbs. (see attached chart from October 2008). With the addition of a few more seats and cargo bins, this would put 612AZ right at our fleet average.

b. Additional Evidence for Corrected Weight

1. In our ongoing research on this topic, our Director of Maintenance has searched for pictures of 612AZ by a mechanic in the east coast facility (Mr. Manogue) from 25 March 08 taken when the aircraft went out to test-fly the firetank system immediately following installation on 25 March. After an extensive computer search of the DOM photo files, we have recovered two photos that were taken 25 March and sent 26 March to our DOM (digitally attached to this file). A careful zoom examination of the high resolution aircraft picture taken while hovering over water shows the dark seat backs in the windows of the aircraft (and the flight engineer is seated halfway back in the aircraft). The pilot's bubble window is also on the aircraft.

What this means is that at a minimum 273 lbs. of seats and 18 lbs. of bubble window are already accounted for in the weight shown on the chart c of 25 March, and were also probably on the aircraft when weighed in January, along with the hoist. This is consistent with Carson's position on the weight of the aircraft, which has been and continues to be that the NTSB-concluded weight is too heavy. It is true we cannot prove that the hoist was on the aircraft when weighed prior to 25 March, but there is proof that the seats and bubble window were already on the aircraft on 25 March 08. This means a minimum adjusted weight from the 25 March Chart C of 13,262 lbs., with the hoist and tank installed.

The final IA firefighting weight shown of 13851 lbs. would then be revised to 13,560 lbs. We feel strongly that this weight should also be reduced by the weight of the hoist, since it is effectively added in twice (minus 17 lbs. for the bracket), but we do not have empirical evidence other than personal recollection for the hoist being on the aircraft on 4 jan 08. This

would make the IA firefighting equipped weight of the aircraft 13442 lbs., if we begin from the jan 04 weight and assume no other errors.

2.We made a documents request from the FAA for their records of the aircraft, which NTSB should already have in possession. We found that an FAA DAR named Nicholas Morales did an airworthiness inspection on the aircraft that was issued 10 August 07. As part of the FAA-filed paperwork, he shows a weight and balance from 6 August 07 on his form with a listed empty weight of 12491 lbs (see attached file). We do not currently have a chart A for this weighing, but it was just a few days after receiving the aircraft and would have been equipped with sponsons, seats, etc. in the configuration received from CHC. The sponson removal alone would have dropped this weight to 11,876 lbs., which is very close to the corrected weight we show for the aircraft from 4 jan 08.

c. Fleet Weight Comparison

To put the NTSB derived aircraft weight of 13851 lbs. in proper perspective, we have attached a chart showing our other five fleet long-body S61 aircraft. This chart shows the weight of the aircraft as weighed by Carson after the accident in October 08 at our facility. These weighings were done utilizing our new weighing procedures, and were witnessed by the FAA. Some of the weighings were witnessed by USFS and NTSB personnel. The aircraft are fully equipped for IA firefighting, including cargo bins and seats, and were weighed 3 times each on certified jackstand scales, rotating scales between weighings. As can be seen from the chart, the fleet average for the five long-body aircraft similar to AZ is 13,050 lbs, with the tank and snorkel on the a/c.

The heaviest aircraft in Carson's entire fleet of 14 aircraft is 725JH at 13,229 lbs. This weight is similar to the heaviest configuration for offshore work for any S61 of which Carson has knowledge, which would include 22+ seats, sponsons, long range tanks, survival equipment, etc. A perusal of the CHC chart C dating back to 2003 shows that even in its heaviest loaded offshore configuration the accident aircraft never approached 13,800 lbs. In other words, assigning a weight of 13,851 lbs. based on a weighing that we know is not complete in documentation is simply not credible and does not pass any smell test at more than 800 lbs. heavier than our fleet average for recently weighed and verified aircraft similarly equipped. The difference between our heaviest and lightest long body S61 is only 569 lbs., with 3 other aircraft in between. Statistically, it makes no sense to take our heaviest weight aircraft and then add several hundred pounds to arrive at an aircraft weight that is out of bounds from any other S61.

We have been given the weight and balance of the S61 helicopter that replaced our aircraft on USFS contract by VIH Helicopters. This is a similarly equipped long body S61 with the fixed gear configuration (see attached Chart B-the Chart A is available upon request). It is equipped with

all gear except the seats and tank system, and the weight is 11940 lbs. With the addition of seats at 275 lbs. it will weigh 12,215 lbs. This aircraft is equipped with the Carson blades and is a sister ship to those in our fleet.

To recap:

-There were acknowledged errors made in the 04 jan 08 Chart A that did not include equipment that we know was on the aircraft from photos and personal recollection taken after the weighing. Even the most conservative version of this calculation results in a corrected weight much lighter than the NTSB derived weight.

-We have an FAA form from an FAA DAR that shows an aircraft weight of 12491 lbs. during the airworthiness inspection that conflicts with the NTSB weight, but corrected for similar configuration puts the aircraft right at our fleet average.

-Our fleet average for similarly equipped and recently weighed long-body S61 helicopters equipped for IA firefighting is 13,050 lbs., 800 lbs. less than the NTSB weight. We have no helicopter in our fleet that is nearly as heavy as proposed by NTSB.

-The weight that NTSB is showing for the aircraft is unreasonable and does not match any of the other N612AZ weighings that we have, nor any other aircraft in our fleet, nor any heavy equipped offshore S-61 aircraft Carson has seen, nor the firefighting VIH S61 that replaced it on contract.

We understand there are several weighings for this aircraft with different degrees of incomplete documentation due to configuration changes, but a review of the weighings available with the configurations as we know them at the time all indicate that the aircraft was considerably lighter than the NTSB estimate. The NTSB derived figure is no more accurate than the numbers we have shown above and in fact does not fit the trend of any of the other weights for the aircraft or fleet as configured. It would probably be more accurate to start from an average of the fleet.

We feel strongly that the aircraft weight in this report and the performance report need to be revised, or inaccurate data will be derived from inaccurate weights. The aircraft weight should be revised downward to at least reflect the weight of the seats and bubble window. This is still heavier than we believe the aircraft could weigh; however, it follows the NTSB formula of starting from the 04 jan 08 weighing, with corrections for the seats and bubble windows.

We expect that the NTSB wants the best set of facts available with which to conduct analysis. We remain committed to discovering the cause of this accident, and we feel strongly that these comments and corrections should receive careful consideration and inclusion in the factual report.

July 10, 2009

Via Facsimile and Regular Mail

Thomas E. Haueter
Director, Office of Aviation Safety
National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, DC 20594

Re: "Iron 44" Firefighting Accident
NTSB Identification: LAX08PA259
Aircraft: Sikorsky S-61N – N612AZ
Date: August 5, 2008
Location: Weaverville, CA

Dear Mr. Haueter:

I am the President of Carson Helicopters, Inc. and I am writing to bring to your attention Carson's serious concerns with the conduct of the "Iron 44" accident investigation of N612AZ. As you know, Carson is a party to the investigation.

The issues of concern include possible tampering and destruction of evidence relating to the fuel control units from the accident aircraft, numerous factual errors and inappropriate assumptions in the respective NTSB Group Chairmen's draft factual reports, and the disregard of substantive factual information related to the fuel control units and contamination that was found that would have resulted in a loss of engine power. These issues are critical not only to understanding the tragic events that occurred on August 5, 2008 but, more importantly, it is possible that a similar event may occur in the future if corrective actions are not immediately forthcoming. Carson has repeatedly brought these issues to the attention of Jim Struhsaker, the Investigator In Charge (IIC) on this investigation. Unfortunately, the IIC has declined to develop additional factual information or to conduct investigative activities that will further validate the factual information that has already been revealed thus far in this investigation.

(Copies of the NTSB's draft reports and Carson's responses are provided). I have reviewed the NTSB's Major Investigations Manual, and based on the information contained in that manual, I believe it is necessary to ask your Office to address these concerns to protect the integrity of the Safety Board's investigative process.

Additionally, because there are significant factual errors in some of the Group Chairmen's factual reports, as well as issues that remain to be developed in the investigation, we respectfully request that the public docket not be opened until the reports have been corrected and issues related to additional investigative activities have been fully addressed and resolved. Further, we are in the process of preparing for the Technical Review that is currently scheduled for July 30, 2009. Based on the concerns expressed in this letter, we request that the Technical Review be postponed so that the factual errors can be corrected and the development of additional information can occur so that the discussion at that meeting can be productive with regards to the identification of the root causes and safety enhancements.

Throughout this investigation Carson has worked with the IIC and the Group Chairmen in a spirit of cooperation, and attempted to ensure the integrity of the NTSB's processes by identifying factual errors, or making relevant suggestions as to additional tests or examinations that are necessary to identify not only the cause of this accident but to identify issues that we believe will continue to exist and cause future accidents. Unfortunately, the way this investigation has been conducted to date creates the impression that the Safety Board investigators are not interested in developing all of the facts, conditions or circumstances of this event. The failure to conduct a thorough and methodical investigation is contrary to the Safety Board's historical operating practices and gives us the impression that Safety Board investigators are neglecting several critical facts in a rush to judgment.

We also believe that the U.S. Forest Service, which had operational control of N612AZ at the time of the accident and is being sued by at least one of the families of the accident victims, has influenced this investigation and used investigation information for punitive actions that do not enhance safety. Based on our understanding of the NTSB process, the use of information developed during an accident investigation for punitive or adverse action is also contrary to the spirit of cooperation and free-flow of safety-critical information necessary to enhance aviation safety.

It is also important to acknowledge at the outset that the investigation has uncovered certain problems with Carson's weight documents for N612AZ and unexplained anomalies with a performance chart used at the time of the accident. Carson acknowledges the existence of these issues and has taken steps to correct them, including improved internal controls over the weighing process. However, these problems and anomalies did not have any adverse effect on the operational performance of N612AZ, nor did they contribute to the loss of power that

resulted in the crash of N612AZ shortly after takeoff on August 5, 2008. As we discuss below, while the weight of N612AZ at the time of the accident cannot be known with certainty, the existing weight records and a comparison of Carson's other long body models both demonstrate that N612AZ must have weighed at least several hundred pounds less than the weight used in the NTSB's draft Operational Report. Moreover, while a mislabeled performance chart was mistakenly utilized in bidding on the Forest Service contracts and then propagated into the flight manuals, the mislabeled "five minute" power available chart actually presents valid performance data for "2.5 minute" power, and N612AZ was flying for far less than 2.5 minutes before the crash. The FAA-certified Sikorsky Flight Manual makes it clear that there are several flight envelopes under which the 2.5 minute charts can be utilized, and, unlike other twin engine helicopter manuals, the Sikorsky manual does not indicate this chart can only be used for emergency use or single engine operations. In any case, if the correct performance parameters for N612AZ on August 5, 2008 are used, the aircraft had enough performance available with properly functioning engines to remain within the margins of both the 2.5 and 5 minute power available charts. Thus, the mislabeled chart was not a causal factor in this accident, and the overemphasis on the weight issues and document anomalies by the investigative team demonstrates to us a rush to find a simple, but incorrect, cause for the crash. Hard scientific data concerning the actual cause of the accident is being ignored. This hard scientific data points to malfunctioning fuel control units serviced by Columbia Helicopters, Inc. (Columbia) as the root cause of the accident. The post-crash conduct of Columbia, which may involve tampering with and destruction of evidence related to these units, must be fully investigated, not simply handled "internally" by the NTSB.

The concerns stated in this letter have been raised numerous times during many team meetings and have been the subject of several letters and emails to Jim Struhsaker, the IIC on this investigation, and other members of the investigative team. Additionally, Carson's lawyers have sent letters to the NTSB's General Counsel expressing these concerns. Carson has repeatedly asked the NTSB to investigate the concerns stated in this letter, particularly the issues relating to potential tampering or destruction of evidence and ongoing safety issues relating to fuel control units serviced by Columbia. The IIC and the other members of the investigative team have so far either failed to substantively respond to our many requests, or sought to minimize or ignore them.

I. The Potential Tampering With or Destruction of Evidence From the Accident

There are serious questions concerning the potential destruction of and tampering with evidence regarding N612AZ's fuel control units (FCUs). Carson has twice requested that the NTSB conduct a full investigation into the handling of these fuel control units recovered from the accident wreckage and has been advised that the NTSB has determined to treat this issue as an "internal" matter. We believe this is insufficient and request that the Office of Aviation

Safety conduct a full investigation into this matter, or refer the matter to the appropriate authorities, to determine whether evidence has been tampered with or destroyed.

This matter is important to ensure the validity and credibility of the NTSB's findings with regard to the "Iron 44" firefighting accident and for reasons of public safety. Many other fuel control units serviced by Columbia are currently in use throughout the world. Indeed, Columbia operates the only authorized commercial overhaul facility for the fuel control units used in the General Electric CT-58 engine series, which are used in many S-61, H-3 and BV-107/CH46 helicopters in operation today. The facts that give rise to our concerns about the handling of the fuel control units are as follows.

On August 13-14, 2008, at the direction of the NTSB, the two engines with fuel control units from N612AZ were recovered and sent to Columbia's overhaul facility in Aurora, Oregon for disassembly and examination. The inspection was attended by NTSB, USFS, Carson, General Electric, FAA, Sikorsky and Columbia and several notable observations were made during the examination of the engines and fuel control units. There were notable differences in the condition of the two engines. At that time, there was general group consensus that there appeared to have been a power loss in one engine.

Upon completion of the inspection, the component parts of the fuel control units were placed in specific bags and stored (unsecured) at Columbia. These units remained in the sole custody of Columbia until August 18, 2008 when the NTSB directed (at Carson's insistence) that the units be sent to NTSB Headquarters. An inspection of these units at NTSB Headquarters was performed on August 28, 2008 and revealed that the fuel control units had been packaged by Columbia in two separate boxes and not in their original bags. Further, numerous component parts that had been present during the initial inspection on August 13-14 were missing. Many of the missing parts are critical to the Safety Board's analysis of the loss of engine power during the accident takeoff. To date, these missing parts have not been located. The boxes shipped to NTSB Headquarters also contained additional component parts that were not present when the fuel control units were initially inspected at Columbia's overhaul facility and other parts had been switched between the two fuel control units.

At the time of the accident, Columbia was in possession of another fuel control unit owned by Carson that had been removed from N612AZ prior to the accident and sent to Columbia for repair and overhaul. The NTSB requested that this FCU be sent intact from Columbia to Hamilton Sundstrand (the unit manufacturer) facilities in Connecticut, along with any associated inspection and repair documentation. The unit was received at the Hamilton Sundstrand facility on 18 September 2008 and unpacked in the presence of the NTSB investigative team. It was discovered that the fuel control unit had been completely disassembled down to the smallest parts, and was in hundreds of pieces that had been

individually stripped and cleaned. The parts were commingled in two plastic bags. The dozens of intricate, small parts from the interior of the fuel control housing were thrown together in these plastic bags in a very haphazard and damaging manner. In addition, there was no paperwork or documentation accompanying this FCU that described the authorization to disassemble the unit, or the work that had been performed. Thus, it was not possible to ascertain when the unit had been disassembled or cleaned, or whether any parts had been serviced. The disassembly of this fuel control unit makes it impossible to determine the condition of this previously installed unit on N612AZ or the possible reasons for the failure of this FCU to perform properly.

The NTSB Materials Lab Report on the FCUs from N612AZ revealed a significant amount of contaminant materials in, and scoring of, the pressure regulating valve (PRV) of both fuel control units (particularly, the #2 FCU). This type of contamination and physical damage to a PRV can adversely affect the power output of the engine and cause a loss of power similar to that suffered by N612AZ immediately before it crashed. Previous studies of trapped contaminant material in PRVs show that the presence of such trapped contaminant is a clear indicator that contamination is present elsewhere in the fuel control unit, which would compromise engine performance. The contamination found in N612AZ's PRVs is similar to that found in at least two other fuel control units that had been serviced by Columbia. Transport Canada found that contamination similar to that found in N612AZ's fuel control units caused a PRV to stick which resulted in a loss of engine power that contributed to the cause of a crash involving an S61N helicopter operated by Hayes Helicopter Services in 2002. GE and Hamilton Sundstrand also inspected a previous Carson FCU in 2004 that had malfunctioned and found similar contaminants. Based on the evidence revealed thus far in this investigation, it is evident that a power loss caused by contaminant in the fuel control unit and PRV valve may well have caused a loss of engine power which culminated in the crash. It is the concern of Carson, as a Party to the Safety Board's investigation, that these issues related to fuel control units may reflect problems with Columbia's overhaul services or facility. In order to help address these concerns, Carson has offered to the NTSB IIC several times to make available for inspection one fuel control unit that was previously removed from N612AZ with an FCU failure and a unit that was recently overhauled by Columbia. Unfortunately the IIC has inexplicably declined to inspect these units. We believe that these facts raise serious concerns about possible evidence tampering or destruction, as well as a potential ongoing threat to aviation safety, that need your immediate attention. We again request that these units be inspected.

II. Errors and Irregularities in the Draft Operations Group Factual Report

The draft Operations Group Factual Report contains several instances in which the Group Chairman has mis-stated facts that are demonstrably inaccurate and selectively edited information that biases the report. These errors are detailed in our written responses to the

Operations Group Chairman Factual Report (attached), as well as having been brought to the attention of the Group Chairman by Carson technical staff. These errors present a skewed and selective view of the accident that is consistently incorrect.

The Operations Report Uses Inconsistent and Incorrect Weather Data

The temperature and wind data cited in the Operations Factual Report appears to be selective and an attempt by the investigator to support a preconceived conclusion that N612AZ had inadequate takeoff performance during the accident takeoff. The erroneous temperature and wind data is not based on data derived from the accident site and cockpit voice recorder (CVR) information, but rather from a compilation of data from various sites located many miles from the accident site. This erroneous data has been used by the Performance Group in its Hover Study, and thus the conclusions about the available performance margins for the accident takeoff are suspect. In fact, just recently Carson was provided the NTSB's meteorological factual report that does NOT support the wind or temperature data used for both the operations report or hover study.

The following is a detailed discussion of our concerns regarding the Safety Board's application of the incorrect weather data:

1. **Temperature Data**

The Operations Report states twice that the temperatures as called by the co-pilot for the accident takeoff and recorded on the CVR are not being considered by the Safety Board because the IIC and/or Group Chairman believe that the exact location of the aircraft and the accuracy of the temperature gauge could not be determined. This is incorrect. The location of the aircraft is known based on the data from the aircraft's Skyconnect GPS unit. Further, information provided to the NTSB demonstrates that the air temperature gauge used by the copilot was checked for accuracy less than 10 days prior to the accident.

The CVR indicates that, at 19:33:26, N612AZ passes through 6,300 ft., only 355 feet in elevation above the helispot. About 1.5 minutes later, and certainly lower in altitude, the CVR indicates that the aircraft is on short final bearing and the co-pilot calls temperature as 20° C. Less than 40 seconds later, the aircraft's GPS unit shows the aircraft already on the ground at 5,945 ft. elevation. From this data we know that when the temperature is read as 20° C., the aircraft is on a short final approach very close to the helispot, descending and less than 300 ft. above the helispot location. The Adiabatic Cooling rate as per the NTSB for this area is 3° C per 1,000 ft. of elevation. The actual temperature was certain to be less than 1° C less than when read by the copilot, or between 19 and 20° C.

At 19:39:18, four minutes after the aircraft landed, the co-pilot is heard to be carefully considering the temperature as between 12 to 13° C cooler than the 32° C mission planning temperature. The air temperature gauge that the copilot was reading from was directly in his line of sight near his head. Subtracting 12 to 13 degrees from the 32° C mission planning temperature indicates a temperature of between 19 and 20° C at that time.

In contrast to the relatively precise temperature data found on the CVR, the meteorological data used by the NTSB in the Operations Report is an average of temperatures extrapolated from a weather station more than six miles away and 1,300 ft. lower than the accident site. Those experienced in mountainous terrain know that temperatures can vary widely from one side of a ridgeline to the other, and the accident site is located in some of the most rugged, steep and topographically varying wilderness terrain in all of California. In addition, there was a 60,000 acre fire burning in close proximity to the helispot, which in combination with the steep mountains could have had a drastic effect on localized temperatures and wind currents. Assuming similar temperature trends at such widely disparate locations in these conditions cannot be as accurate as a temperature reading taken at the site.

However, even the data from the distant weather station presents a similar temperature to the CVR when the extrapolation math is properly calculated. According to the NTSB investigators the average temperature at the distant weather station was 23.5° C at 4,700 ft. elevation. Adjusting this 23.5° C average temperature to account for the 1,249 ft. higher elevation found at the helispot results in an extrapolated temperature of 19.7° C for the helispot -- virtually identical to that called out by the copilot on the CVR.

We note that section 5.0 of the Meteorological Factual Report contains a NOAA Air Resources Lab (ARL) NAM (North American Model) sounding for 2000 PDT on the day of the accident. This is apparently a smooth model created from available data that uses an algorithm to create a forecast sounding over the accident site at different time slices. For the 2000 PDT time slice the model shows that an altitude corrected temperature for 6,235 ft. (the approximate altitude that the aircraft was at on short final prior to landing when the copilot calls out the temperature) is 19.8° C, which is nearly identical to the temperature actually read from Backbone and then corrected at the standard cooling rate for elevation. All three of these temperatures, 1) the properly calculated extrapolated temperature from Backbone, 19.7° C; 2) the ARL model temperature, 19.9° C; and 3) the actual temperature read by the copilot, 20° C; are within 0.3° C of each other.

The NTSB author continues to utilize a 23° C temperature reading for the accident takeoff that is not supported by facts, and is at best a rough approximation. It is not the best data available, which is the multiple temperature readings announced by a professional pilot on the CVR at the time and place of the accident at 19-20° dC. How does the NTSB continue to justify ignoring the

best temperature data available in place of computer modeled approximations from many miles away across severe terrain?

In deciding to use a 23° C temperature for the accident flight, the NTSB has disregarded relevant information from the CVR that indicates a more precise temperature reading made twice by the copilot (with several thousand hours of military and civilian flight experience) from a temperature gauge that was checked less than 10 days before the accident. The FAA, USFS and DOT rely on OAT temperatures read by trained professional pilots for mission planning, load calculation adjustments, realtime aviation weather reports, and flight safety decisions every day in conjunction with flight operations all over the United States. The temperature used by the NTSB is one that is artificially calculated based on temperature readings taken tens of miles away at weather points of unknown exposure or accuracy and then averaged for the area and altitude. The NTSB's averaged reading also does not take into account localized differences in heating or cooling from extreme mountainous terrain, the fire, sunlight exposure, wind cooling or other factors. Moreover, even if the NTSB chooses to use data from the distant weather station, if it correctly adjusts such data for the helispot's higher altitude it will reveal a temperature that is very close to that evidenced by the CVR data and the modeled data in the NTSB Met. Report, which is 20°C.

2. Wind Data

The Operations Group Factual Report states that the winds were calm at the helispot during the accident takeoff. This contradicts the CVR (at 19:30:33) in which the ground helitack manager can be heard telling the pilots that winds are "the same as the previous takeoff" -- 3-5 knots out of the South, which would be a headwind. This is a clear audible report from a trained professional at the location less than 4 minutes before the aircraft is on the ground at the accident site. A 3-5 knot wind out of the South is also evidenced by digital photographs that were taken less than 20 minutes after the accident which show a smoke plume blowing upslope from south to north. The co-pilot also recalled throughout his interview that there was wind blowing upslope from the south at 1 to 2 o'clock off the helicopter's nose. The NTSB's own meteorological report shows consistent light to moderate winds of 4-12 knots at every helipad location in the accident area and the general surrounding area -- except for the H44 location, which is listed as calm. The statement in the Operations Group Factual Report that the wind was calm is not supported by witness statements, the co-pilot's statement, the weather-trained helitak manager's CVR report, or the known wind data for the area in the meteorological report. This wind data is significant in determining the true performance margin available to the aircraft during the accident takeoff.

A. The Operations Report Significantly Overstates The Weight Of The Accident Aircraft

The NTSB Operations group has consistently assigned a weight for N612AZ that is considerably heavier than the aircraft could possibly have weighed. This coupled with the incorrect wind and temperature data discussed above, has significantly and incorrectly skewed the performance margin cited in the Hover Study and presents an incorrect scenario about the operational weight of the aircraft that is contrary to the existing data.

N612AZ was utilized for multiple missions and configurations in the 13 months that Carson owned the aircraft. The aircraft also was weighed at least 4 times in less than 12 months, which is unusual for a large helicopter (for example, the previous owner of the aircraft weighed it once in 4 years). These multiple configurations and weighings generated multiple weight documents which make it challenging to ascertain the actual weight of the aircraft at the time of the accident.

The Operations Group Factual Report currently lists the weight of N612AZ at 13,845 lbs. empty and 19,008 lbs. on the accident flight. This weight is far heavier than the aircraft could have weighed and the methodology the NTSB used to reach this weight is incorrect. This weight deviates significantly from the fleet average for Carson's S61 helicopters and the weight of any other comparably equipped S61. Carson has presented several corroborating pieces of data contained in the NTSB's own documents that have come to light during the course of this investigation that demonstrate that the aircraft weight used by the NTSB is incorrect and overstated. Carson believes the aircraft weight was 13,440 lbs. empty and 18,603 lbs on the accident flight.

January 4, 2008 Weighing and Hoist Test Weight Documents

It is apparent that the NTSB determined the accident aircraft weight by starting from a weight document for N612AZ generated on March 25, 2008 which is based on notations added to a weight document created on January 4, 2008. There are errors by both Carson in preparing the January 4, 2008 weight document and the NTSB in using the document to derive aircraft weight. We have demonstrated in previous correspondence and documents shared with the investigative team that the equipment list associated with this weighing was not properly completed, and we have buttressed this with notations from the maintenance logs. The original document associated with the January 4 weighing shows an aircraft weight of 12,328 lbs. The accompanying equipment list does not show the installation of seats, bubble windows, a hoist or a cargo hook in this weight. This was an error by the Carson mechanic who prepared the equipment list, who was not the same technician who weighed the aircraft. The mechanic who actually weighed the aircraft has stated that the aircraft had seats installed in it when weighed on January 4, 2008. We also know that the aircraft was used for hoist testing on

December 20, and 27, 2007, and that during those hoist tests seats, bubble windows, a hoist and a cargo hook were installed on the aircraft. We know this because installation of this equipment is necessary for conducting a successful hoist test. We know that this equipment was still installed on the aircraft when it was weighed on January 4 because there are no maintenance log entries or work orders which reflect the removal of this equipment during the intervening four work days.[1]

The January 4, 2008 aircraft weight of 12,328 lbs. only makes sense if this additional equipment is installed on the aircraft. There is a December 26, 2007 weight document which shows the aircraft as weighing 12,397 lbs. The maintenance records show that the aircraft was configured with seats, bubble windows, a hoist and a cargo hook by that date. Additionally, the load calculation sheets from the hoist test -- at which point we know this additional equipment was installed on the aircraft since that equipment was necessary for a successful hoist test -- shows the aircraft weighing 12,369 lbs.

Additionally, there was another hoist test done in August 2007 with weight information available in NTSB records. This weighing was done prior to FAA hoist certification testing, and the information is contained in the DAR report of Dave Thomas, the independent DAR. We have an existing weight document from 11 August, we have the maintenance log entries, and we have the equipment denoted by Mr. Thomas for the hoist test, all of which is valid information for calculating weight of the aircraft for the test.

As per his notes and the maintenance log, this 13,073 lb. weight is for an aircraft equipped exactly as the December test except with the addition of offshore sponsons and blowbottles, which adds 655 lbs. The adjusted weight after subtraction of these items (which were removed from the aircraft before December), is 12,418 lbs., less than 100 lbs. different than both of the other weighings.

Fleet Weight Comparison

In October 2008 Carson re-weighed all ten of its contract aircraft utilizing the company's new weighing procedures. The aircraft were weighed three separate times on certified jackstand scales, rotating the scales between jackpoints in between weighings. These weighings, which were witnessed by the FAA, showed that the average weight for Carson's similarly equipped long body S-61 aircraft was 13,050 lbs., more than 800 lbs. less than the weight the NTSB has erroneously assigned N612AZ. In addition to having been weighed by Carson in October 2008, the Forest Service weighed all of Carson's aircraft in October 2008. The average weight for

[1] The collective weight of these items is 520 lbs., which is the aggregate of 75 lbs. for the cargo hook assembly, 135 lbs. for the hoist, 274 lbs. for seats and 36 lbs. for bubble windows.

Carson's similarly equipped long body S-61 aircraft from the Forest Service weighing was 13,134 lbs. -- more than 700 lbs. less than the weight the NTSB's derived weight of 13,845 lbs.

A thoughtful examination of the weight documents relating to N612AZ allows us to solidly conclude that the January 4, 2008 weight of 12,328 lbs. included installed seats, bubble windows, a hoist and a cargo hook. By adding back in the weight of this equipment the NTSB is effectively double counting this equipment and thereby overstating the weight of N612AZ by more than 500 lbs. The effect of this incorrect assumption on the NTSB's part is to understate the performance margin available to the aircraft during the accident and to overemphasize the role that weight played in the crash of N612AZ. Carson first brought this faulty methodology to the attention of the Operations Chairman in February 2009.

In drafting the Operations Report, the NTSB investigative team has made a series of assumptions and errors that drive the apparent conclusions of the report. While there are some instances where assumptions may have to be made, inexplicably, the investigators have chosen in other instances to disregard factual data from the CVR and the statements of eyewitnesses. In every case where the NTSB reviewed weight, wind and temperature data, they selected figures that presented the absolute worst performance scenario for the accident takeoff, even in the face of strong evidence indicating otherwise. Simply stated, despite Carson's best efforts to provide fact-based data regarding the proper aircraft weight, the IIC and the Operations Group Chairman have disregarded this information in an apparent attempt to support their conclusions which are not based on the best available evidence.

B. The Operations Report has Consistent Technical Errors

Carson is concerned that the Operation Factual Report continues to contain many technical errors even after advising the author regarding the inaccuracies. It is perplexing to Carson to offer 50 years of expertise on technical corrections or provide additional information to assist in obtaining the best facts only to have this information rejected or consistently misreported.

1. Both the first and second draft of the report consistently confuse the relationship and contracting authority between Carson Helicopter Services, Inc. (CHSI) and Carson Helicopters, Inc. (CHI). The report continues to mis-state the contracting relationship between the United States Forest Service and CHI. The author states that NTSB only recently became aware of CHI offices in Oregon, which has been an open and known fact from the beginning of this investigation. It is important because the regular mis-statement of the contracting relationship and the relationship between the two companies has legal ramifications.
2. The author continues to regularly reference FAA Part 135 Operations and utilizes the term "passenger" even though it is completely inappropriate to this accident. We have commented before that the correct and legal term for the personnel on board is Non-

essential crewmembers (NECs) instead of passengers. Consistently referring to them as passengers in the report gives a misleading interpretation of the type of flights Carson was engaged in. Carson conducted NO FAA sanctioned or FAA Part 135 flights with passengers as defined by both the FAA and USFS. The FAA considers firefighters as NECs and not passengers by federal statute definition (per AC001). The aircraft was not contracted by USFS to perform any Part 135 operations. It is factually, technically and legally incorrect to refer to the firefighters as passengers anywhere in this report.

3. There are several errors of data, incorrect chart labels, pitch settings, torque settings, CVR sound spectrum data, and other technical parameters (detailed in both Carson responses to the operations drafts) that demonstrate to us a lack of understanding of the relationship and importance of these data. The Performance Chart Analysis in the report is flawed and does not represent the correct performance parameters or the engine health of the aircraft in the accident. It does not represent the actual performance calculations of the pilots that day or conditions at the time of the accident. Several suggestions Carson has made to resolve errors have been ignored or rejected.

III. The Errors in the Operations Report Improperly Skew the Conclusion of the Hover Report

While Carson agrees with the general methodology the NTSB has used for calculating hover power based on the General Electric mathematical model, those calculations are based on the incorrect weather and weight data discussed above and the resulting conclusions are wrong.

The conclusions reached in the hover study indicate that the accident takeoff had the least margin of Hover Out of Ground Effect (HOGE) weight available among the three takeoffs N612AZ made from the accident site that day. However, utilizing the correct wind, temperature and aircraft weight data shows that during its first takeoff N612AZ had less HOGE performance available than any other takeoff including the accident takeoff. The correct data also shows that the HOGE margins available were higher than currently listed for all takeoffs. The inescapable conclusion is that if the aircraft had a smaller performance margin available on its first takeoff yet flew away safely, then something must have happened to the aircraft's engine during the third takeoff -- when even more performance margin was available -- to cause the aircraft to crash.

IV. The Investigation Fails to Focus on the FCUs

Throughout the investigation, Carson has been consistent in urging that the NTSB look closely at the two FCUs recovered from the accident wreckage as a potential cause of the accident. When Carson personnel examined the results of the NTSB Materials Report on the Pressure Regulating Valve (PRV) from the FCUs we felt strongly that the results merited additional focus

by NTSB. Despite clearly pointing this out during a team meeting and insisting that our concerns be addressed, the investigators seem determined to ignore this issue.

A. The Materials Report Shows Significant Problems With The FCUs

In the FCU used by the accident aircraft, the PRV regulates the fuel brought from the fuel pump to the throttle valve. It regulates pressure and metering to the rest of the FCU, which affects fuel delivery. The clearance of the spool to the sleeve (valve body) inside the PRV is 0.0004 inch.

The Materials Report makes it clear that foreign material was located in the PRVs of both FCUs, with much more material found in the #2 PRV. There is severe longitudinal scoring on the inside walls of the PRV, and a large amount of particulate matter inside the valve on #2, with similar but less scoring and material in the #1 PRV. It is well known in the industry that particulate matter inside a PRV can and will cause sticking and slowing of the valve, which can cause engine management issues and power loss. Contaminate collected in the PRV is also a significant indicator of possible contaminants elsewhere in the fuel control system because the wall-valve clearance is very small and can cause contaminant to get trapped. Contaminant of this magnitude anywhere in an FCU is potentially catastrophic. Similar contaminant in PRV's and FCUs has previously caused accidents in S61 helicopters and we believe that it probably caused the crash of N612AZ.

Carson has provided to the NTSB investigators a report generated by General Electric for Columbia in 2005 -- three years before the N612AZ accident -- regarding the analysis of two fuel control units sent to GE by Columbia. One is a Carson unit that was removed from service because of engine gas generator speed fluctuations and which exhibited a stuck PRV. The other was removed from the wreckage of a Hayes Helicopter Services helicopter that crashed in Canada in 2002. The microscopic photos of the contaminant material in those FCUs look virtually identical to the contaminant material found in the #2 FCU from N612AZ. The similarities in material and in the longitudinal scoring are striking. In the GE report, the particle size is 2.5 to 25 microns, which is smaller than the 40 micron spool clearance, but definitely large enough to stick the valve and cause scoring. The particles found in the #2 PRV from N612AZ are larger and more numerous and presumably would cause greater damage to the accident aircraft's FCU. The GE report identifies the fibers as silica-based and possibly fiberglass. GE mentions these are not fibers that are normally in the fuel system environment and mentions that the common denominators between the two FCUs analyzed in the GE Report are the fuel used and the overhaul maintenance facility.

Transport Canada's investigation into the Hayes Helicopter mishap showed that the accident was initially caused by a different malfunction on the # 1 engine. However, the # 2 engine did not respond properly after the initial malfunction due to a sticking PRV. This is the PRV that is referenced in the GE report. This is the PRV that was contaminated in an almost identical manner to the FCU from N612AZ.

Carson has also reviewed a Columbia training manual regarding internal maintenance procedures at Columbia. There is a section on material getting into the PRV that states in part, "If the filter goes into bypass, all of the dirt, metal shavings, etc. get flushed directly through the fuel control. Often it ends up in the PRV valve: At this point, the fuel control will no longer respond to droop. Despite the large volume of fuel being circulated through the fuel control, contaminants like this may pass through the PRV many times, resulting in intermittent failures to respond." This troubleshooting passage indicates that contaminant found in the PRV collects there, meaning that it could also be present and affect other components in the FCU, such as servos for Stator Vane Actuators.

The scoring and large volume and size of material in the PRVs shown in the NTSB Materials Report is an indicator of potential fuel pressure control issues which may have directly led to the crash of N612AZ. After the accident and the subsequent disappearance of several parts from the accident FCUs, Carson requested that Columbia Helicopters return all Carson FCUs in its overhaul facility to Carson. Two previous FCUs had been removed from N612AZ in the months before the accident because of surging and power loss issues and sent to Columbia for analysis and repair. As discussed above, one of those FCUs was sent directly from Columbia to the NTSB cleaned and completely disassembled into tiny pieces rendering the unit not useable or subject to meaningful analysis. However, the other FCU removed from N612AZ before the accident, was returned to Carson intact and has been sitting untouched in our facility in Perkasie, Pennsylvania since being returned. We have repeatedly offered this FCU and one fresh from overhaul to the investigators for inspection but they have refused our offers. We specifically request that your office direct the IIC to inspect these units.

B. The CVR Data Supports A Conclusion That The FCU Failure Caused This Accident

It is apparent that some of the NTSB personnel and Party members have relied on the CVR sound spectrum data to support their respective opinions that both engines were putting out full power all the way to impact because Ng (gas generator speed) was at topping for both engines. It is well documented in the maintenance manual for the CT-58 engine that it is entirely possible to have a condition with an engine at topping speed (high Ng), but not producing the rated power to the main rotor blades:

> 1. Troubleshooting gas generator speeds – C. Trouble: Ng stays at maximum with Nf (power turbine) abnormally low when under load (indicates low power output).
>
> Probable cause: Stator Vanes remain closed. Troubleshooting: # (4) - Check fuel filter systems for contamination. Corrective action: Replace fuel control and pilot valve. Correct source and clean fuel system as necessary. *GE CT58 Maintenance Manual, page 175.*

The CVR data indicates that Nr (rotor RPM) was dropping rapidly shortly after liftoff and that it occurred at an altitude that was beyond recovery from a low altitude hover. With a normally performing engine, the pilot could immediately lower collective to increase Nr and one would expect to see a series of plateaus on Nr as the pilot tries to do so. Instead, in the CVR data, Nr droops steadily and continuously below 90% while Ng remains at topping, which is indicative of rated power not being delivered to the rotor system rather than simply a hot and high takeoff.

We observe from the CVR data that on each of the three takeoffs the flat pitch Nr setting degraded from 108.7 % to 107 % to 106 %. This is a physical stop setting and should not have changed from takeoff to takeoff. This change is indicative of power degradation to the rotor on successive takeoffs, even the second takeoff, which was at a much lighter gross weight than either of the other takeoffs.[2]

On 24 October 2008 Carson took a sister ship to N612AZ and conducted flight evaluations at weights significantly beyond what the accident aircraft is believed to have weighed, and with engines tuned at minimum specification.[3] The flight test aircraft was loaded to 19,300 lbs. gross weight and flown at the same and higher density altitude as the accident takeoff. Even with dramatic collective input to the top stop, the rotor system would not droop below 95% Nr, and the aircraft was still climbing at over 300 feet per minute. The only flight application in this test where Carson could get Nr to droop steadily to 90% with non-recoverable loss of rotor rpm similar to the CVR accident takeoff data was when the crew pulled power back on one engine.

[2] The single torque gauge recovered from the accident aircraft in uncompromised condition confirms that N612AZ was suffering from an engine problem when it crashed. That torque gauge showed the #2 engine was producing 30% less torque than the #1 engine at impact. As detailed above, the #2 engine had significant volumes of contaminant in the PRV of the FCU.

[3] The accident aircraft engines were tested and found to be functioning at +1.5 and+4.5 specification less than 4 flight hours prior to the accident.

Carson has offered several times in writing to conduct additional flight evaluations at our own expense under conditions witnessed and approved by the NTSB investigation team. The NTSB has turned down all such offers to conduct controlled condition flight evaluations at different gross weights and power settings. We specifically request that your office direct the IIC to conduct these flight evaluations.

V. Conclusion

In its simplest form, the salient facts of this accident are as follows:

The accident aircraft weighed a maximum of 13,440 lbs. on the accident flight, with a fuel load of 2158 lbs. and a payload of 3005 lbs. -- for a total weight of 18,603 lbs. On the accident takeoff, the temperature was 19 to 20° C as called on the CVR, and there was a 5 knot headwind, as called on the CVR, reported by several eye witnesses and supported by the NTSB's own meteorological report. These conditions with actual engine health yields a performance figure from the approved chart of 19, 150 lbs., or a performance margin of 547 lbs.

On the first takeoff from H44, the gross aircraft weight was 17,885 lbs., at 29° C, 6000 ft. and 5 knot headwind. The calculated performance was 18,200 lbs., or a 315 lb. margin. In other words, the aircraft had 232 lbs. LESS performance available on the first takeoff of H44 but flew away without incident. With more performance available on the 3rd takeoff, the CVR data shows the aircraft experienced rapid and steady rotor RPM loss and crashed. The evidence strongly suggests an engine power loss issue, and the NTSB has evidence that there was significant contaminant material in the fuel control unit of the #2 engine. Similar material in the FCU has been independently proven in the past to have caused engine management and power loss problems resulting in malfunctioning engines and at least one prior S-61 crash.

Carson is respectful of the NTSB's investigative process and has made every attempt to be an active and constructive Party member. Further, it has been the intent of the Carson personnel participating in this investigation to be supportive and provide useful, relevant comments with regard to information that has been developed. Carson has responded promptly to NTSB requests and kept all information and concerns confidential. The concerns expressed to the IIC, the respective group chairman and now in this letter serve as Carson's input to ensure that all of the facts, conditions and circumstances of this accident are identified, and that the factual information is valid. Thus, we believe that it is incumbent upon the Safety Board to review our concerns in concert with the available data and consider additional investigative activities to ensure both the thoroughness and integrity of the investigation. In addition, we believe that

the Safety Board should examine the two additional FCU's for similar contaminant material in an effort to track where this material is originating.

As stated previously, Carson is bringing these matters forward to protect the integrity of the NTSB's processes and ensure the integrity of this investigation and to ensure that the actual cause of the accident is determined. We also believe that the concerns addressed in this letter about the FCUs present a serious and ongoing aviation safety issue that if not immediately addressed by your Office could result in another crash and the further loss of life.

In addition to providing the information contained in this letter we would request the opportunity to meet with you, alone or with Mr. Struhsaker or any or all other members of the investigative team, at your convenience to discuss the factual matters brought forth in this letter. Additionally, Carson again offers a controlled flight test of a similarly equipped aircraft at multiple weights and engine power settings in similar flight conditions in order to provide empirical data to compare with the known data from the accident aircraft in order to determine what factors truly affect the ability of the aircraft to successfully fly away or not fly away.

In closing I would like to again request that you take action to ensure the integrity of this investigation. Additionally, because there are factual issues that remain to be developed in the investigation and because we want to make sure that whatever goes into the public docket is factually correct, we respectfully request that the public docket not be opened until the matters discussed in this letter are fully addressed. The technical review meeting should also be postponed so the issues identified in this letter can be fully discussed at that meeting.

Thank you for your attention to this matter.

Sincerely,

Franklin Carson
President

Carson Helicopters, Inc.

cc: Jim Struhsaker

Date : 9 July 2009

TO: Jim Struhsaker, Zoe Keliher

FROM: Carson NTSB Operations Party Members

RE: Operations Factual Report, LAX08PA259

Carson group members received the 2nd draft of the Operations factual report from Zoe Keliher late on 2 July 09. Her attached email solicits comments from group members by 10 July 09. Please find our extensive attached comments. Carson party members have had only minimal suggestions or requested changes to the other group factual reports, generally finding them to be a plain statement of the facts.

We have found several issues with the way the operations factual report is constructed, which directly impacts the Hover Study Report as well. Several of these issues were pointed out in our 1st response to the original draft. Some of those inaccuracies were corrected, and many other important issues were either not corrected or have additional information included in this version that makes the report even more questionable. In general, there are several demonstrably serious inaccuracies and selective editing of information in this version that deforms the purpose of the report, which should be to present the true facts in an unbiased fashion.

Page by Page Comments and Corrections

Summary note

We note that the first sentence of the summary has changed several times. It now says "….N612AZ impacted trees and crashed near Weaverville, California, during takeoff." It previously stated that N612AZ crashed during takeoff. We feel it should contain reference to the loss of rotor rpm, since it is a documented fact from the CVR spectrum data that the rotor rpm dropped dramatically during the crash. The way this sentence has been changed now implies the aircraft crashed because it hit the trees, which is not known to be the case at this time. We believe the previous generation of wording that the aircraft "crashed during takeoff"

is more accurate and avoids the potential misreading that the aircraft crashed as a result of flying into trees.

Pg.1, footnote 3 – We have commented before that the correct term for the personnel on board is Non-essential crewmembers (NECs) instead of passengers. Consistently referring to them as passengers in the report gives a misleading interpretation of the type of flights Carson was engaged in, and this becomes relevant in the discussion contained in the report regarding Part 135 operations for passengers. Carson conducted NO FAA sanctioned or FAA Part 135 flights with passengers as defined by both the FAA and USFS. The USFS Director of Aviation, Ms. Pat Norbury, has made it repeatedly clear in safety meetings with the USFS that flying firefighters at a fire is not a Part 135 operation, and is a public use flight that is not subject to FAA jurisdiction. The FAA considers firefighters as NECs and not passengers by federal statute definition (per AC001). Carson only conducted missions with NECs on board, and the report should be changed to reflect this very important distinction. In fact, any reference to Part 135 operations or 135 Operations Specifications is *irrelevant* to this investigation because no Part 135 operations took place, and the aircraft was not contracted by USFS to perform any Part 135 operations, and the aircraft was under the operational control of the USFS, not Carson. It is factually, technically and legally incorrect to refer to the firefighters as passengers anywhere in this report. A footnote to that effect is not sufficient for the legal accuracy of this distinction, which we have pointed out in previous correspondence.

Pg. 2, line 3-4 – The helicopter was registered to Carson Helicopters, Inc. of Grants Pass, Oregon as clearly stated on the FAA registration which NTSB has in possession.

Pg. 2, line 5-6 – "….and a company visual flight rules flight plan had been filed." This should properly say, "….and a USFS visual flight rules flight plan had been filed." There is no company flight plan filed when conducting public use flights for the USFS; flight plans are done through the operational control body, which was USFS.

Pg. 7, line 13 – the report states that the helicopter departed at 1814 "with a slight wind of 3 to 5 knots". There is no mention of wind direction. In the initial report this was listed as a 5 knot tailwind. We note that in the new weather table in this report and the table in the meteorological report they show winds are calm for all takeoffs from H44. This changing inconsistency in weather data in the report narrative is a serious issue. See our response on weather for more information.

P.7,line 22 – The Nr on this takeoff was 108.5 %, not 108%. There is an important trend in this takeoff Nr, and it needs to be correctly reported.

P.9, line 4 – The Nr is 107% on this takeoff, not 108%. This has been consistently mis-reported.

P.9, footnote 23 – we have previously commented that Carson standard training procedure is to consider the aircraft to be fully fueled when the tanks have 2500 lbs. of fuel. Thus the pilot's

comment is correct, since for safety reasons Carson does not put more fuel in the tanks than this under any occasion. To continue to call this statement" incorrect" does a disservice to the pilot and accepted procedures, and serves no purpose. This comment should be deleted.

P.10, line 19 – "….and the PIC pointed out that the temperature had cooled" The SIC reads this temperature, not the PIC.

P.10, footnote 27 – "It is unknown at what altitude this reading was taken, and therefore that temperature is not used…." This statement is not true, and Carson previously has provided extensive factual satellite data contained in the NTSB Airworthiness report and CVR analysis that shows the location of the aircraft within 200 ft. when this reading was taken. This data was provided in our previous response, and the author has totally disregarded the plain facts. This statement should be removed, because it is false.

P.11, line 9-10 – "….he called out 90 and then 103 percent." This should be clarified to make the reader aware that he is calling out 103 % Nr, not 90% torque and then 103% torque. We see footnote 29, but it is not clear from the text body that the copilot is announcing two different parameters.

P.11, line 14 – The Nr is 106-106.5 % here, not 107%. As noted previously, these figures have been consistently mis-reported, and they are important indicators of the engine (see next note). This is hard data from the sound spectrum plots, and needs to be corrected.

P.11, Footnote 30 – The information contained in this footnote regarding flat pitch Nf/Nr is plainly wrong. "These transient overshoots of Nr are not steady state flat pitch Nr values, which varied between 106 % and 107% Nr when briefly pausing at flat pitch before collective is increased. According to the engine manufacturer, the transient and steady state flat pitch Nr's may depend on pilot technique advancing the throttle control levers and collective pull-up."

1. There are no transient overshoots in this data. The Sikorsky flight limitation for dual engine flat pitch is 107% to 109 % (Sikorsky N SA4045-2 manual, part 1, section 2, page 2-8B), and there is no data in the sound spectrum analysis that indicates any overshoot, which would be in excess of 109%.

2. The flat pitch setting is a physical hard stop setting that is adjusted by a bolt stop and locknut that is impacted by the fuel control lever when the throttles are placed in the full forward position. A setting of 108.7 % would be a proper adjusted flat pitch setting, which is near the maximum power attainable by stop adjustment without exceeding limitations. The throttles are physically held in <u>full forward stop position by the copilot against the stopnut on every takeoff as part of standard takeoff procedure with this aircraft.</u> We know from CVR pilot-copilot comments (and eye witness survivor comments) that the copilot advanced and held the throttles in the full forward position prior to collective engagement by the PIC on the accident

takeoff, as they do on every takeoff (for physical setting procedure of the flat pitch tach, Sikorsky Aircraft S61N Maintenance manual, SA4045-80, section 73-20-0, page 204C).

3. Part of the FAA approved checklist for this aircraft to be checked every day is to verify the flat pitch /full throttle position. This flat pitch setting should not change from takeoff to takeoff as the throttles are placed in the full forward position each time. With due respect to the engine manufacturer (whose expertise does not extend to Airframe and Flight Control issues), it is not affected by pilot technique in any way at this setting prior to collective engagement. The very fact that the physical flat pitch stop setting at full throttle with the same pilots shows a degradation on each succeeding takeoff on the sound spectrum plot is a serious indicator that there is a loss of power to the rotor between the 1st and 3rd takeoffs from H44. Carson has been consistently pointing this out to NTSB since December 2008, and this factual information is verifiable by outside experts.

This footnote paragraph as written is completely factually incorrect, and combined with the incorrect stating of the flat pitch on each takeoff in the text combines to give a false indication of this important engine parameter. This needs to be corrected or deleted.

Pg. 18, line 8-10 – This wording should be changed to reflect the fact that all of the checkrides that the inspector pilot had given to the three CHSI pilots were in an S61 aircraft. It is true he was not type rated and did not perform pilot duties, but he had flown in an S61 several times prior to the accident, and the record should reflect that.

P.19, line 14- The copilot's last training was completed during the first week of June, 2008, not may 18.

P.20,line 14 – this should be 2007, not 2008.

p.20, footnote 44 – This footnote relates to text that states the aircraft was reconfigured from CHC. It notes that the blades were changed; in fact, several configuration changes were made to the aircraft, including configuration changes to the landing gear, seats, cargo hook, interior, and removal of overwater equipment. The note gives the false impression that only the blades were changed. It should be changed to show that several configuration changes were made – this has an impact on the weight of the aircraft.

P. 21, footnote 47 – " Although CHSI refers to these checks as "power checks" they are actually "topping checks"". Carson refers to these as power checks because according to the Sikorsky Flight Manual they *are* power checks (as well as being called topping checks). The Sikorsky manual SA 4045-82, page 2-14A has a note at the top that states "The following power checks are applicable to the CT58-140 engines" and then lists both topping checks and power assurance checks. The chart that is referenced in this procedure is labeled a "power available" 2.5 minute chart. This comment should be changed or deleted.

P. 22, line 12 – "….CHI supplement 7 is used to obtain engine shaft horsepower." We have previously pointed out that any FAA approved 2.5 minute power available chart for the -140 engines in this S61 aircraft can be used to obtain the correct figures. An operator is not limited to Supplement 7, which is a proprietary supplement. This should be changed to avoid confusion.

P.23, line 20- This entire paragraph is irrelevant and should be removed. This section of Carson's Operation Specifications is not used or followed for public use flights with the USFS. The USFS Operational Control supersedes our part 135 procedures, and in fact we follow USFS approved procedures for manifesting NECs and load calculations, which conflict with our Operations Specifications. It is confusing and misleading to include this information since it is not used in USFS flight operations, and was not used by the accident aircraft.

P. 25, Footnote 52 – "…the load calculation performed by the pilots 560 lbs. was erroneously used." The USFS published the official flight weight reductions in late spring of 2008, and it listed the weight reduction for the S61 at 560 lbs. The pilots correctly used the published load reduction figure. USFS later acknowledged that they had misprinted the reduction in the publication. The note implies that the pilots applied incorrect data, which is not true. This should be revised to indicate that the pilots did not "erroneously use" 560 lbs. It was the proper published download factor from the USFS at that time, and the pilots did the right thing in using this figure.

P.29, line 4 – The report should indicate that this weight from CHC as received was for an aircraft configured for offshore crew transport operations, which was significantly different than a firefighting mission configuration.

P. 29, line 15 - This noted comment by the DAR (Designated Airworthiness Representative) about the main blades not being on the aircraft is very strange and misleading at best. The maintenance log shows that Chief Inspector Dave Wolf of Carson certified on 9 August 07, "This a/c has been inspected and is determined to be in airworthy condition. Note: Transponder and ELT to be installed prior to flight." This indicates the aircraft is legally ready to fly except for the transponder and ELT. On 10 August 07 the DAR maintenance log entry states"I find that the helicopter ….meets the requirements for the certification requested, and have issued a Standard Airworthiness Certificate in the Transport Category."

It is not technically legal for a DAR to issue an Airworthiness Certificate for a helicopter without rotor blades on it because it is not in an airworthy condition. The Perkasie Inspector (D. Wolf) would not legally certify the aircraft as airworthy without the blades on it unless he so notes this in the log, as he did with the transponder and ELT. The maintenance log entries for 10 and 14 august noting the installation of the blades are the date the work orders were noted as being completed and signed off. This is not necessarily the date of installation, and in fact many other installation work orders (cargo hook, outside gauges, 500 hour inspections, etc.) on the

aircraft were signed off the same day, but were completed sometime prior to this date. Either the blades were on the aircraft and the DAR does not remember correctly, or he illegally certified the aircraft as airworthy without rotors. A review of the log indicates the blades were already on the aircraft. This comment gives the misleading impression that the blades were off the aircraft during the previous weighing, which is extremely unlikely given the certifications noted above. It does not provide any useful information, is not corroborated by the record and should be removed.

P.30, line 6 – The chart A's that are being compared here are from 2007 (CHI) and 2003 (CHC), *four years apart*. This should be made clear in this paragraph.

There are several comments regarding aircraft weight statements for this report; please see this specific section "Aircraft Weight" in this response.

P. 45, line 13 – "….to define the helicopter's HOGE limitations." This is not correct, this chart defines Max Takeoff and Landing limitations at a 10 ft. wheel height, <u>not</u> HOGE limitations.

P.45, line 22 – This paragraph is irrelevant. The takeoffs from H44 were not Category B takeoffs, they were confined area vertical takeoffs. No Category B distances were required, and this Category B information does not apply and needs to be removed to avoid confusion.

P. 46, line 3- RFMS was issued February 7, 2008.

P. 46, line 10-12 – "…….is the chart used to show the maximum specification torque available when one engine is inoperative; only single engine operation (OEI) limits are shown." This statement is incorrect. It should properly read ""…….is the chart used to show the maximum specification torque available when one engine is inoperative <u>at sea level on a standard day</u>; only single engine operation (OEI) limits are shown <u>for sea level limits</u>."

The single engine chart shows maximums for single engine for a *sea level operation*. As long as maximum torque from the two engines together does not exceed 206%, this chart can be used for two engine operation at elevations above sea level, because the aircraft is transmission limited. The pertinent pages from the Sikorsky flight manual outlining the single engine limits at sea level and for dual engine operation are attached here. The current report gives the false impression that this chart is <u>only</u> utilized for single engine operation, and that is incorrect. The wording should be changed.

P. 47, line 27-30 – This sentence is misleading in the extreme. First, the chart contained in the email was voluntarily given to the NTSB by Carson immediately following the accident. Second, the email itself was given to NTSB several months ago by Mr. Bob Boyd, who is the CHI Chief Pilot and a CHSI registered 135 pilot and a current employee. Carson and its lawyers were made aware of this by Mr. Boyd, had no objection and were aware that NTSB already had the email. Third, as part of the ongoing subpoena document process, Carson had a hard drive copy

made of computers and email of senior personnel through a forensics company hired by our lawyers. Our law firm delivered this extensive set of data to the NTSB legal counsel in a pre-arranged schedule of document delivery. It was Carson's understanding that this data and the email previously provided by Mr. Boyd had been re-delivered to NTSB as part of that forensics package at the date of the report. The first time Carson was aware that NTSB did not have another copy of the email was in the draft report. It had apparently not been delivered at that time as part of a large volume (over 25,000 pages) of material from our law firm; this fact has been stipulated to by our legal counsel and the email was subsequently delivered as part of the ongoing subpoena delivery process. There was no attempt made to hide any data or email, and Carson management was of the understanding that NTSB had been in receipt of both the chart and the email for several months. The writer of the report uses the acronyms CHI and CHSI as a device to incorrectly imply that Carson was withholding information from NTSB; this is factually wrong and slanted to cast doubt on CHI. It should be removed from an NTSB Factual report.

P.49- Footnote 92 – " Later in the investigation he opined that a terminated disgruntled employee had switched the charts in an act of sabotage." We objected to the inclusion of this sentence in the first draft, and we strenuously object to its inclusion now. Early in the investigation, several theories were advanced by several parties as Carson tried to understand how the mislabeled chart was propagated into our operations system. We had a disgruntled former employee that had been caught fabricating other documents, so there was some discussion regarding this possibility. However, this was quickly discarded as were several other theories and Carson hired a professional forensics company to try to trace the origin of the chart. This sentence is completely extraneous to the investigation, and CHI discarded that theory early in the investigation. The inclusion of this sentence lends nothing to a factual report, and only serves to arbitrarily slant the tone of the report, which should not be the goal of the author.

P.51, line 7-12 – Several places in this paragraph the author labels this chart as "maximum weight to hover OGE". This is wrong, and we have pointed this out before. This chart is clearly labeled "power required to hover OGE". It is a performance chart and is not a maximum limitation chart. The word "maximum" misleads the reader into believing this is a limitations chart, which is factually incorrect. This word needs to be removed.

P. 51-52, Power Available Charts – The author has plotted data and HOGE weights on these two pages from the two charts referenced elsewhere in the report. The author has used 6000' and 23 deg.C with 5 minute power and minimum specification engines. This is confusing as to intent. If the author is trying to show the HOGE power that the crew would have derived in performing their weight calculations, then we should be using the parameters the crew utilized to calculate their performance that day. If the author is purporting to show the actual available power to the aircraft with the two different charts at the accident, then the plus performance

margins of both engines should be added, and the available 2.5 minute power should also be shown along with this chart. As it stands, this chart and the associated HOGE weights gives the misleading impression that this is the performance available to the aircraft on that day, which is incorrect (notwithstanding that the temperature and wind data being used in the calculation is also incorrect, as detailed elsewhere in this response).

The mislabeled "five minute" power available chart actually presents valid performance data for "2.5 minute" power. The FAA-certified Sikorsky Flight Manual makes it clear that there are several flight envelopes under which the 2.5 minute charts can be utilized, and, unlike other twin engine helicopter manuals, the Sikorsky manual does not indicate this chart can only be used for emergency use or single engine operations. This should be made clear in this report.

P.52, line 9 – "CHI had two offices in Grants Pass…" This is wrong. CHI has one facility in Grants Pass, and it is a shared facility with CHSI.

P.52, footnote 93 – "Following the initial review of the draft of this report was the first time Safety Board Investigators were informed that CHI had facilities in Grants Pass." This is not true and is a very odd claim for the author to make; it is not supported by the history of the investigation.

1. CHI has had a facility in Grants Pass, Oregon since 1991. CHSI was issued FAA flight certificates in 2006. CHI has been conducting flight operations from Oregon for 18 years, and this fact was made plain to NTSB personnel in the early stages of the investigation.

2. The registration of the accident aircraft (which NTSB has) clearly states "CHI – Grants Pass, Oregon".

3. The author visited our facility last fall, and was told then that both companies are housed in the same facility. The author was informed that all USFS fire contracting for CHI was done from the Grants Pass office, along with CHSI, and had been that way for many years. The author was given business cards from the Vice President and the Director of Helicopter Operations in Grants Pass that clearly state "Carson Helicopters Inc" on them with our Oregon address.

4. Our USFS contracts (of which NTSB has copies) clearly state Carson Helicopters, Inc. of Grants Pass, Oregon on all of the large fire support contracts. Our USFS contract for N612AZ, the accident aircraft, is with CHI in Grants Pass, Oregon.

5. The author has consistently confused CHI and CHSI facilities and contracts on numerous occasions in this investigation. That is not the fault of Carson, and this footnote leaves the completely false impression that somehow Carson has kept secret from NTSB the fact that we have had a CHI office in Oregon for 18 years.

P. 54, line 3-4 – "…awarded contracts for type 1 passenger transport missions (troop shuttles); this was the first passenger hauling operation ……" This is wrong. Carson did not fly any

passengers, only non-essential crew (firefighters). As explained elsewhere, this is an important distinction. We have not engaged in any passenger hauling operations.

P. 54, line 22 – This should read 1 year and 11 months as a pilot with CHI.

P. 55, 2.0 Flight Operations – This section requires clarification. Most of the quoted information is correct, but requires an important clarification. The USFS requires an operator to operate in accordance with their operations specifications for the missions contracted for by USFS. The USFS does contract operators to perform passenger hauling flights; examples would be flying USFS management personnel to a conference, or flying elected officials to/from a fire, or ferrying citizens from one forest to another. Flying firefighters in performance of their mission on a fire is not considered a passenger transport flight by either the FAA or the USFS. Carson did not engage in any passenger transport flights for the USFS. Further, N612AZ in particular was contracted originally for Part 133 large fire support waterbombing missions, which did not even require a Part 135 certificate. Carson did maintain our aircraft to Part 135 standards, and provide Part 135 certified crew, but Carson was not legally or contractually obligated to do so, and did not conduct passenger transport for USFS at any time. This section should be re-written to reflect this fact.

P. 60, line 11 – "….of which CHSI received 7;" This is incorrect. In 2007, CHI was awarded 7 contracts, CHSI was not awarded any.

P. 61, line 14 and line 20 – This should say CHI has actively solicited . CHSI was not even granted flight certificates until 2006.

P. 64, line 11 – "…modifying their contract with CHSI…" This is wrong, the contract was with CHI.

P. 67 Line 29 – To truly be factual it should be added to this section that upon self-disclosure by Carson of the mislabeled chart to the FAA in October 2008, the FAA did a thorough investigation and subsequently found that Carson did not violate any FARs (Federal Aviation Regulations). Carson is considering its protest options of the USFS action in light of this clearance.

P. 70, line 17 – "an inspector noted that 7 Airworthiness Directives were not complied with for the past 2 years." This sentence without explanation leaves a completely false impression that Carson is not complying with ADs (Airworthiness Directives).

The 7 ADs in question were circulated to S61 operators regarding items or parts that are not installed on any Carson S61 (for example, the BIM contained in metal blades of the S61; Carson has no helicopters with metal blades, all our aircraft have composite blade systems installed). It was not possible for Carson to comply with an AD for a helicopter part that is not installed on any Carson aircraft. Carson listed the ADs in the log and checked "not applicable" for them. Our

FAA requested that we apply for AMOCs (Alternate Mode of Compliance) forms instead and Carson did so. The FAA inspector was satisfied and Carson was never found in violation of any regulation. This information should be removed from the report, it is completely irrelevant and there were no violations to our operator record. We note that there is no record of AD compliance violations in the NTSB Maintenance Records Group Factual report.

Meteorological Data Section 1.7

Carson provided extensive evidence indicating that the temperature and wind data utilized in the draft report was incorrect, using the NTSB's own Met. Information. In the revised section, the takeoff temperatures remain exactly the same, and the previously noted tailwind on the first takeoff has been changed to "calm". There is now an attached meteorological factual report that was not made available to Carson previous to this date. There are still serious and fundamental problems with the presentation of the meteorological data in this report.

a. Temperature

The comment was made in a footnote in the report that although the copilot (a highly trained professional commercial and ex-military pilot) references 20 deg.C twice during the accident takeoff from H44, this data is not being used, since we do not know his location. We have already shown that by cross referencing the CVR data and the GPS Skyconnect data, we have an excellent idea of his location when he reads the temperature. As noted previously:

1) At 19:30:33 the helitack person on the ground informs the pilots that winds are the same as before, out of the south at 3 to 5 knots. At 19:33:26, the aircraft passes through 6300 ft., only 355 feet in elevation above the helispot. At 19:34:52 (more than 1 minute later and certainly lower), the aircraft is on short final bearing and the co-pilot calls temperature as 20 deg.C. Less than 40 seconds later, the next Skyconnect data point shows them already on the ground at 5945 ft. elevation. From this data we know that when the temperature is read, they are on short final very close to H44, descending and certainly well less than 300 ft. above the helispot location. The Adiabatic Cooling rate for this area as per NTSB is 3 deg.C per 1000 ft. of elevation. This OAT temperature is nearly certain to be less than 1 deg. C different than at H44 itself when read by the copilot.
2) At 19:39:18, four minutes after they have landed at H44, the copilot is heard to be carefully considering the temperature as between 12 to 13 deg. C cooler than the 32 deg. C mission planning temperature (or 19 to 20 deg.C). The OAT gauge is directly in his left line of sight near his head and he is certain to be reading this from the gauge.

OAT Gauge

On page 44, footnote 84 the author states that a Sikorsky rep says" the OAT gauge is accurate to plus or minus 1 to 3 deg. C". A 3 deg. C range would cause Carson to pull the gauge from use, that is not a normal accuracy for the free air OAT, and the Sikorsky rep must have been simply estimating (Sikorsky would not recommend flying with a free air temperature gauge accurate within 6 deg. F and consider it normal operation). We have attached test and calibration records from an independent lab (Pro-Lab) for six random OAT gauges used in our aircraft, ranging from 2003 to 2008. All are within 1 deg. C of the test cell when tested. The Scott 2716 shows an accuracy of 1.1 deg. C to a maximum of 2 deg.C in their factory range specifications.

The Outside Air Temperature Gauge (OAT or Free Air) was checked specifically for the FAA Hoist Supplement Flight Testing conducted in December 2007. On July 28, 2008 the Free Air (OAT) gauge was inspected and checked during a phase IV inspection by mechanic Tim Obrien, less than 10 days before the accident.

The OAT had been inspected less than 10 days before the accident and identical gauges over a several year period show documented accuracy levels within 1 deg. C in testing. This footnote regarding 1 to 3 deg. C accuracy from a conversation is misleading and wrong and is not adequately substantiated.

In the same footnote the author notes that in the post-accident interview, the copilot stated the OAT just prior to the accident was 22 deg.C. What is not noted is that this interview took place weeks after the accident, the copilot had recently recovered from a two week drug-induced coma, and clearly states he is on high levels of Methadone at the beginning of the interview. He also states in the interview that they initially checked the temperature at 22 deg. and 5700 ft. pressure altitude on the first landing at H44. He also states that there was 3-5 knots of wind on the nose of the aircraft. Later in the interview she is questioning him about the conditions for the whole day, and then says, "prior to the accident do you recall what you called for weather" and he replies "Uh, 22 degrees when we were up on the hill…." This value is identical to the initial reading he mentions earlier in the interview for conditions, and it is not at all clear from her question or his answer if this is" immediately prior to the accident", as the author alleges. The author is using this nebulous temperature from an interview a month after the accident after asking a general conditions question instead of a crystal clear temperature reading taken directly off the CVR at the 3rd landing at H44. This is not a good representation of the facts, and if the author is going to utilize comments from such an interview, then they should be complete, and not selective. Additionally, to give this footnote recollection credence while discounting the clearly stated OAT reading on the CVR while landing at and sitting at the H44 helispot by the same SIC is to selectively ignore the best data we have. This comment should be removed from the ops report and this witness temperature should be removed from the Met. Report, because it is entirely misleading and taken out of context.

The Meteorological Report on Temperature

The Meteorological Factual Report has a great deal of macro regional weather information contained within it, which is useful for general conditions but cannot help in determining the temperature at H44 during the time of interest. It should again be noted that this area is rugged, remote and comprised of extremely steep and varied terrain with severe topographic changes. There was a 55,000 acre fire burning in direct proximity to the accident scene. Utilizing information from one or two weather readings taken 6-12 miles away and attempting to smooth the data and extract temperatures is problematic at best when compared with the temperatures and wind announced on the CVR by trained professionals.

RAWS Data from Backbone Ridge

There is a chart that depicts the observed RAWS data from Backbone, which was the closest recording station over 6 miles away across the mountains and at 4700 ft. elevation. We note that this chart contains slightly different temperatures than we were provided in the initial NTSB weather summary. In the initial summary:

"The temperature reported at Backbone was 30 degrees C. at 1700, and 27.7 degrees C. at 1800. These indications would be consistent with temperatures at H-44 in the range of 25 – 28 degrees C. at the time of the low pass at 1725. Temperatures were cooling from after 1600 and between 1900 and 2000, temperatures at Backbone dropped from 25 degrees to 22 degrees."

The RAWS data in the report has changed this to approximately 27 to 25 deg.C during the same time frame. We need clarification on which data set is correct and are the actual readings. As noted in our previous response, if we use the Backbone temperature data that was provided by NTSB in previous data and assume the adiabatic cooling rate utilized by NTSB, the following applies:

Cooling lapse rate at 5.5 deg.F as listed:
Backbone – (average between 25-22 deg) 23.5 deg.C, 4,700 ft. elevation
H44- 5945 ft. elevation
1249 ft. difference, 6.9 deg. F lapse difference
This results in an H44 correlated temperature of 19.7 deg.C.

However, even if we use the revised temperatures in the RAWS data now provided, the temperature at Backbone was 77 deg.F at 1949, and using the cooling rate this would give a temperature at H44 of 70 deg., or 21 deg.C.

NOAA ARL-NAM modeling

We note that section 5.0 of the Met. Report contains a NOAA Air Resources Lab (ARL) NAM (North American Model) sounding for 2000 PDT on the day of the accident. This is apparently a smooth model created from available data that uses an algorithm to create a forecast sounding over the accident site at different time slices. For the 2000 PDT time slice the model shows that an altitude corrected temperature for 6235 ft. (the approximate altitude that the aircraft was at on short final prior to landing when the copilot calls out the temperature) is **19.8 deg. C**., which is nearly identical to the temperature actually read from Backbone and then corrected at the standard cooling rate for elevation. All three of these temperatures, 1) the extrapolated temperature from Backbone, 19.7; 2) the ARL model temperature, 19.9; and 3) the actual temperature read by the copilot, 20; are within 0.3 deg.C. of each other.

Mesowest Chart

There is no other useful temperature data that correlates to the accident site or elevation until the very last page of the report, which states that" the following table is derived data for the accident helicopter's flight based on streamline analysis of the Mesowest data surrounding the period." It lists 23 deg. C for the H44 accident temperature. No other supporting documentation or explanation of how this temperature was derived or what the "streamline analysis" from the Mesowest data is provided. An examination of the University of Utah Mesowest system shows that the closest actual recording site for data upon which the Mesowest system relies is Backbone. All other temperatures in this region are extrapolated from this RAWS data, which means that it is no more accurate than any of the other smooth data already provided, and is undoubtedly limited in being able to factor in changes in localized temperature due to fire conditions, sunlight, localized winds, etc. In fact, this 23 deg. C. is an outlier based on 1) the previous datasets, 2) the standard cooling rate calculation, 3) the NAM model data, and 4) the actual temperature read by the SIC at H44. It does not align with any other available data.

We have pointed out the inconsistencies in the temperature presentation in our previous correspondence, and nothing in this Met. Report changes the fact that the NTSB author continues to utilize a 23 deg. C temperature reading for the accident takeoff that is not supported by facts, and is at best a smooth approximation. It is not

the best data available, which is the multiple temperature readings announced by a professional pilot on the CVR at the time and place of the accident at 19-20 deg.C. The FAA, USFS and DOT rely on OAT temperatures read by trained professional pilots for mission planning, load calculation adjustments, realtime aviation weather reports, and flight safety decisions every day in conjunction with flight operations all over the United States. How does the NTSB continue to justify ignoring the best temperature data available in place of computer modeled approximations from many miles away across severe terrain ?

b.*Wind*

In the first Operations report, we pointed out that the Hover study and report text body utilize a 5 knot headwind for weight calculations, but all of the Meteorological data listed by the NTSB shows that this is a 5 knot WNW tailwind, which will adversely affect helicopter lift performance and thus affect the conclusions of the Hover Study (among other factors). We also pointed out that on the CVR the Helitak manager on the ground at H44 on the 3rd takeoff tells the pilot that there is 3-5 knots of wind out of the SE, which is confirmed in the copilot interview, yet NTSB inexplicably shows the wind as calm on this takeoff, which adversely affects helicopter performance margins.

Now, in this 2nd version of the report, all of the takeoffs from H44 show calm winds, with no tailwinds and no headwinds. We note that all other wind data for the other locations remains exactly the same in the chart, yet the 5 knot WNW tailwind on the first takeoff has somehow become calm, although the other WNW winds at the other locations remains. We find this extremely unusual to say the least.

The Meteorological Factual Report on Wind

The Met. Report attached to the 2nd draft shows that in the RAWS data, Backbone showed winds consistently from the SSE from 3 to 9 MPH, gusting to 16 MPH, with winds increasing in the afternoon. Big Bar RAWS data shows winds from SW to W at 3 to 6 MPH, gusting to 19 MPH in early evening. The NOAA ARL model for the H44 area contained in the report for 2000 PDT shows winds from 4 to 12 knots depending on altitude, with winds of 8 knots at 5800 ft. at 110 degrees. Several of the witness statements indicate winds from the SE at 3-5 knots on the last takeoff at H44 (including the weather-trained helitak professional manager, whose job it is to relay accurate wind data to the pilots).

Finally, the Mesowest smoothed data chart contained in the report shows winds from 2 to 10 knots at every landing/takeoff from Trinity base to H36 that day, *except for the H44 takeoffs, all three of which are listed as calm.* How does it seem possible that

NTSB's own Met. data shows light to moderate winds everywhere in this very mountainous area for the whole afternoon, yet somehow there are no winds whatsoever on all three H44 takeoffs ? Why does NTSB attach enough importance to quote Bill Coultas's witness interview regarding temperatures twice in the report, but neglects to ever mention that he was very consistent in the same interview about describing steady winds on the nose of the helicopter on the takeoffs and how important this was to the aircraft ? How can the NTSB discount the CVR recorded input of Mr. Vassel, the senior helitak manager present at the site, telling the pilots that there is 3-5 knots of wind at the accident takeoff ? Why is his recorded comment not included in the Met. Report with the witness statements, along with the actual recorded CVR temperature by the copilot of 20 degrees ? This data appears to be subject to either manipulation or inaccuracy.

The picture that NTSB included in the Met. Report on page 15 purporting to show the smoke plume as calm at ground level is misleading. This picture was taken by Mr. Reid while inbound to the accident. He was coming directly from Willow Creek base, at a bearing from the NW to the ridge when this picture was taken (according to his weblog about the accident). This smoke plume then is coming nearly directly at the aircraft, and it is not possible to tell if it is blowing out of the SE at ground level. On the other hand, we have enclosed a photo from Mr. Reid taken just a few minutes later as they circle the accident in the same aircraft that clearly shows the smoke plume blowing upslope from the accident. This photo was evidently not included in NTSB determination, since it is not included in the report.

In summary, the regional RAWS weather data, the witness data, the CVR data, the recorded interview with the copilot and at least some photographic evidence all show that there was moderate 3-5 knot wind blowing from the SE on the accident takeoff. NTSB has simply ignored all this data regarding wind at the accident takeoff; and further arbitrarily changed the meteorological tailwind data on the first takeoff with no explanation of how this wind parameter could change to calm, but all the other WNW wind data remain exactly the same.

As with the temperature data, the NTSB author has selectively chosen arbitrary and unverifiable wind data and ignored the best information available, which creates a false set of meteorological parameters from which to calculate aircraft performance. This entire section of the operations report is not compiled using the best data and is not an accurate representation of the unbiased facts.

Aircraft Weight

We have commented extensively on the NTSB derived weight of nearly 13,900 lbs. in our first response to the operations report. We produced extensive information demonstrating that this weight is beyond the bounds of any known weight for the aircraft and does not fit the data that we have from other weighings for N612AZ, nor does it fit the fleet averages for all our aircraft. In this draft of the report, the author disregards all of this information and essentially indicates an unwillingness to consider all pertinent information to arrive at an accurate weight for the aircraft.

Carson will not re-list all the information provided in our previous correspondence, but will try to present the information in a concise form here.

Known Weights

1. The CHC listing for June, 2007 – 13,279 lbs. – This weight is not useful for determining N612AZ's firefighting weight because the aircraft as received from CHC was in an offshore configuration, which is quite different than the final configuration for N612AZ. We know that it was equipped with offshore flotation sponsons, and some internal equipment for offshore work. We also know that the last time the aircraft was physically weighed was 2003, more than 4 years before. Regardless of chart C entries, comparing weights that are 4 years apart on a helicopter that changes configurations is problematic at best.
2. August 10, 2007 – The conformity inspection was done by the DAR and his records indicate a weight of 12,491 lbs. for the aircraft. This was done shortly after receiving the aircraft and still included the sponsons, but had some of the other offshore gear removed.
3. August 15, 2007 – 13,073 lbs. – This weighing was done prior to FAA hoist certification testing, and the information is contained in the DAR report of Dave Thomas, the independent DAR. The NTSB author notes in the report "that it is unknown how the aircraft was configured since there is no new chart A". This is not true. While we do not have a new chart A, we have the existing chart A from a weighing done on 11 august, and we have the maintenance log entries, and we have the equipment denoted by Mr. Thomas for the hoist test, all of which is valid information for calculating weight of the aircraft for the test.

   As per his notes and the maintenance log, this weight is for an aircraft equipped with:

   Goodrich Hoist - 135 lbs.
   13 seats- 273 lbs.

Bubble Windows- 36 lbs.
Sponson gear- 615 lbs.
Misc. blow bottles, etc. for sponsons - 40 lbs.
Cargo hook assembly – 75 lbs.

If we account for this equipment and then configure this aircraft exactly as the beginning weight utilized in the NTSB report for firefighting at the top of page 38, and add the tank and snorkel system, the aircraft weight is **13,199 lbs.**

4. December 20, 2007 – 12,369 lbs. - This weighing was done in preparation for additional hoist testing done during the last week of December. Again, the NTSB report says that since there was no chart A, it is unknown how the aircraft was configured. Again, this is not true, and we have previously provided detailed documentation to NTSB about the aircraft configuration.
   The chart B weight was accompanied by notes and an FAA load calculation sheet for the hoist test and maintenance log entries that show what was installed on the aircraft. After the hoist test, maintenance records show that a transmission run-in was completed on 12/27, which requires the cargo hook for completion (the maintenance log shows that the cargo hook was installed some time prior to the signed work order on 27 dec; the chart B from 12/26 shows a note about corrected weight without the transmission run-in kit in lower left). We know from the Chart A in August as well as the last chart A from CHC that seats were installed in the a/c and no log entry shows removal prior to 04 Jan.

The attached chart shows a weight of 12369 lbs. on 26 december. The log shows the hoist was installed on 20 december. The hoist test load calculation sheet shows 12369 lbs. and is marked “hoist test” and “verified 12/27/07 D.W.” on the sheet. All flights for hoist operations are conducted with the bubble windows installed.

5. This information shows then that the aircraft was configured on 27 December with:
6. Cargo hook assembly – 75 lbs.
7. Goodrich Hoist - 135 lbs.
8. 13 seats- 273 lbs.
9. Bubble Windows- 36 lbs.
10. Total 519 lbs.

If we account for this equipment and then configure the aircraft similarly to the beginning weight on Page 38 for firefighting, then the weight, equipped with tank and snorkel, is **13150 lbs.**, or within 49 lbs. of the previous hoist test weight.

5. January 4, 2008 – 12328 lbs.- This weighing was done in Perkasie just 4 work days after completion of the hoist test. Carson has previously acknowledged that the Chart A notations were incomplete for this weighing. The technician who completed the weighing was not the same technician who filled out the Chart A, and some errors in notation were made. Carson has revised its weighing procedures to avoid this error in future, and has been very open about acknowledging that some errors were made in weight annotations on the Chart As.

The accompanying chart A does not show the installation of seats, hoist or bubble windows in this weight. This was an error in annotation for the chart A. The chart A from the August weighing show that the aircraft had a total of 13 seats installed at a total weight of 273 lbs. (5 singles @ 25 lbs, 4 doubles at 37 lbs.). There is no maintenance entry to show that these seats were removed until late the following spring, and we supplied NTSB with pictures that show seats in the aircraft while flying in March 2008. This aircraft was utilized for rescue hoist FAA supplement testing from December 20th to the 27th, and a transmission run-in was done on the 27th, as noted above. Also as noted above, there is a total discrepancy of 519 lbs. of weight not correctly noted on Chart A. <u>It is not physically possible to remove all those items and then have a weight on 4 January of 12328 lbs., only a 41 lb. difference from 27 December</u>.

Conversely, this aircraft equipped similarly to 27 December, as it certainly was, is within 41 lbs. of the 27 Dec. weighing less than a week previous and is within 91 lbs. of the 1st hoist test weighing in August (when corrected for sponson removal).

If we correct for these additional items that were on the aircraft but not accounted for in the 4 Jan chart A, then this would result in a minimum corrected aircraft weight on 4 january of 11,809 lbs. (without the tank, snorkel or other fire equipment cargo bins,etc). Our fleet average for all our longbody S61 aircraft configured for IA firefighting but without the tank and snorkel is 11,960 lbs. (we have previously provided all this documentation to NTSB). With the addition of a few more seats and cargo bins, this would put 612AZ right at our fleet average.

<u>Consistent Average Weights and Averages</u>

NTSB has taken a "last known" Chart B weight from 4 Jan 07 and then added items to the chart C from 25 March to arrive at a weight that is unrealistically heavy for any S61. In essence, NTSB has added the weight of the items noted previously on to the aircraft twice, resulting in a weight that is not valid for the aircraft. Carson noted this same issue to the report author in February 2009 in separate correspondence. Carson has been very consistent that the aircraft could not have weighed what the report author has shown.

If we apply the same logic used to arrive at the NTSB weight to the known Chart B weight from 26 December with the known configuration the aircraft was in for hoist testing then we get an aircraft weight of **13150 lbs.** configured, as noted above.

The USFS independently weighed our aircraft in October 2008 on USFS scales. The weighings were not done in accordance with manufacturer's procedures, but even as an approximation the USFS fleet average for our longbody equipped aircraft was **13,248 lbs**. with tank and snorkel, less than 100 lbs. different than the consistent weight shown above.

All of these weights when adjusted for configuration fit with the weight noted by the FAA DAR on 6 August as well. The reality is that we have valid proof via FAA test documents, configuration notes, and maintenance log entries of three weighings that when adjusted for similar configuration are all very consistent with each other and remarkably consistent with both inside and outside fleet weight averages. The *only inconsistent outlier* and the only weight that does not make any sense with the existing body of data that is available for this helicopter is the current NTSB weight of 13, 845 lbs., which is unrealistically heavy by at least 400 lbs. compared with all the other data that we have for this aircraft.

Carson also pointed out in previous correspondence that the NTSB weight is not consistent with S61 aircraft outside Carson's fleet, including the VIH helicopter that replaced a Carson ship on fire contract.

The author has ignored all the previous data available for the aircraft as well as the last known chart C of the aircraft of 12408 lbs. in June 2008 in order to come up with a weight that is not supported by the known facts.; it is unusual and suspect because it is the only weight for the aircraft that does not fit the rest of the available data. This aircraft weight is wrong and needs to be revised.

Individual Comments of specific points in the weight section

P. 33, chart – has a header that reads "Grants Pass weighing". Carson has stated several times that the aircraft N612AZ was never weighed in Grants Pass, and this is a chart A from the Pennsylvania weighing. This header is confusing and misleading and should be removed.

P. 37, footnote 73 – This footnote is misleading. It is true that in October 2008 we initially believed the seats and hoist and cargo hook were not installed in the 4 january weighing because we had very incomplete information at the time and simply referred to the Chart A that was available. As we began to review all the weight information available to us, and particularly after we received the copy of all the aircraft records from the Perkasie office in late December 2008, we realized there were discrepancies in the chart A weights that needed to be reconciled. Carson replied to an inquiry by Ms. Keliher in February 09 and stated at that time that our review of the chart A of 4 january showed it was not complete and we cautioned at that time that she was double-adding weight to the aircraft in her analysis. We did not receive any other correspondence or information from Ms. Keliher for several months until the 1st draft report arrived in May. We also note that the author has changed several items in this investigation since last October as additional data has emerged. We have done the same as we

have learned more from additional analysis of the information available; to do otherwise defeats the purpose of the investigation.

The author states that we submitted no documents to substantiate our weight analysis in response to the draft ops report. This is not true. We submitted extensive information regarding the two hoist tests and the weights and the configuration of the aircraft during the tests, including DAR FAA information and chart Bs. We also submitted information on our fleet weights and the weights of other industry S61 helicopters. All of the information provided shows that the 4 jan weighing documents did not properly account for the equipment we know was mounted on the a/c but not listed, and showed that her calculated weight was not reasonable with any other S61 weights. The picture and the statements by Mr. Carson are simply offered as additional corroborating evidence to this documentation, but they do not constitute the body of information we provided. The way that the author has worded this footnote is extremely misleading and incomplete, and completely disregards the additional weight data we sent for the aircraft. It should be deleted.

P. 41, footnote 78- "indicates the location of weighing …." This is wrong. This only indicates the person and place where the documents were prepared and put in standardized format, not necessarily the physical weighing. This should be changed.

P. 42 line 4- "….10 CHSI helicopters" this is incorrect. There were 5 aircraft contracted with CHSI and 5 aircraft contracted with CHI. This should be changed.

P.43 – (n) Additional Information (Weights) – several comments in this paragraph are misleading and wrong. "prior to this response, safety board investigators were only made aware of 2 weighings that occurred after purchase: August 11,2007 and January 4,2008." And further down the paragraph "Additionally, after viewing this report, CHSI personnel provided Safety Board investigators the Chart B from December 26,2007, weighing and several spreadsheets referencing empty weights of 12369 lbs. and 12,397 lbs. that were apparently used for hoist flight testing in December 2007." And "..CHSI personnel insisted that the only other weighing was performed on August 11,2007" These statements are quite revealing about the fashion in which the author has approached this issue, and are incorrect.

1. Carson had already advised the author in February of 2009 that there were issues with the NTSB analysis of the 4 January weighing and their proposed derived weight, and we were looking into how the aircraft was equipped. We did not receive any data or further communication from the author regarding weight until receiving the 1st draft report in May, at which point we could see several inaccuracies in the weight data.

2. We began an extensive analysis of all of the Perkasie records that we had available. The NTSB has had copies of the same Perkasie records since October 2008. All of the information that we supplied to the NTSB in our response regarding previous weighings, the hoist test

information and chart Bs are ***already*** in the possession of the NTSB, and frankly should have been reviewed and included in the weight analysis prior to Carson bringing them to the NTSB's attention. The information on Mr. Thomas's DAR report on the first hoist test and the weighing, the 2nd hoist test and the weight provided by Mr. Morales on 6 August 07 is in the NTSB's *own attachments* to the first draft of this report (419021,419022,419023). For the author to state in this paragraph that Carson only just recently provided them with information NTSB has actually had in possession for months does not reflect well on the direction of this factual NTSB report. The NTSB had the capability to review the Perkasie records and the independent FAA supplied weight information before CHSI personnel had them.

In response to the first draft report and after acknowledging that some errors were made in the company weighing procedures, Carson has made a serious effort to look at all the available data and combine the most consistent set of known information in order to arrive at a responsible weight for the accident aircraft. This is exactly what the NTSB should be doing, together with Carson. This paragraph (n) is written to infer that Carson withheld weighing evidence from NTSB. This is completely false as demonstrated by NTSB's own records. In actuality we are trying to make NTSB aware that their own body of evidence does not support the current weight analysis. The current aircraft empty weight shown of 13,845 lbs. is wrong by at least 400 lbs. and needs to be revised.

In the spirit of providing NTSB factual reports that are unbiased and contain the best information available, we respectfully request your attention to these important issues.

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August 31, 2009

VIA E-MAIL AND OVERNIGHT EXPRESS

Thomas E. Haueter
Jeffrey Guzzetti
Office of Aviation Safety
National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, DC 20594

Re: NTSB Identification: LAX08PA259
Aircraft: Sikorsky S-61N – N612AZ
Date: August 5, 2008
Location: Weaverville, CA

Dear Mr. Haueter and Mr. Guzzetti:

This firm represents Carson Helicopters, Inc. and Carson Helicopter Services, Inc. (collectively, "Carson") with respect to the above-referenced investigation. As part of this representation, we have provided Carson's comments pursuant to 49 C.F.R. § 831.6 regarding planned attachments to various drafts of the National Transportation Safety Board (the "NTSB" or the "Board") Operations Group Factual Report ("Report"). In his August 20, 2009 letter to us on this topic, a copy of which is enclosed as Exhibit A, NTSB General Counsel Gary L. Halbert, stated that certain of Carson's comments relating to the planned attachments to various drafts of the Report are outside the purpose of his § 831.6 consultation and that these issues should be resolved at the technical level through representatives of the Office of Aviation Safety. The purpose of this letter is to bring these issues to your attention and to request that these items be stricken from the Report for the reasons discussed below.

I. Record Of Conversation Between Zoë Keliher And Joseph Rice

The Record of Conversation between Zoe Keliher and Joe Rice, attached as Exhibit B, should not be publicly disclosed. This document is an unsworn statement by a disgruntled former Carson employee that includes inaccurate, unsubstantiated and improper attacks on Carson and certain of its employees. The investigative team has made no effort to obtain a response from Carson, or to otherwise validate or corroborate Mr. Rice's statement, even though Carson has advised that it is prepared to refute the statement. Had the investigator done so they would have learned, for example, that Mr. Rice was permitted to resign from Carson rather than be

terminated for cause. They would have learned that although Mr. Rice claims that Carson "lodged several protests" and "was fraudulently awarded a contract," Carson filed only one protest which was *sustained* by the Government Accountability Office which recommended that award be made to Carson. They would have learned that Mr. Rice's assertion that Carson falsely represented that its aircraft can be equipped with a 1,000 gallon water tank is also wrong. Not only are Carson's tanks FAA inspected and certified, Mr. Rice was quoted in a 2006 Vertical Magazine article (attached hereto as Exhibit C) discussing the various mission capabilities of the Carson Fireking utilizing a 1,000 gallon tank. The investigative team was apparently not aware of these facts for the simple reason that they did not ask.

Moreover, in response to our June 1, 2009 objection to the release of this statement, the NTSB provides only the conclusory assertion that Mr. Rice's statement "has relevance to this investigation." (Exhibits D and E). However, the NTSB has not, because it cannot, justify the relevance of this statement to the investigation. Mr. Rice has provided no facts or details regarding operating conditions on the date of the accident, N612AZ, or the performance of its crew. Indeed, none of the NTSB's draft Reports issued to date even mention Mr. Rice's statement. In the absence of any demonstrated relevance of this statement to the investigation, and a fair opportunity for Carson to respond, we reiterate our strong objection to the public release of this statement. This inclusion of this highly prejudicial statement by the investigative team is inconsistent with fundamental notions of fairness and due process, and raises troubling questions about the integrity and objectivity of this investigation. It should be removed.

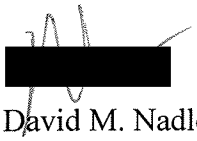
II. Improper Characterization Of The July 7, 2008 Email

While Carson has no objection to the inclusion of the July 7, 2008 email from John Harris, Carson strongly objects to the inappropriate characterization in the draft Reports of the manner in which the NTSB received this document. The draft Report wrongly implies that Carson withheld that email from the NTSB. The email was provided to the NTSB by Robert Boyd in the Fall of 2008. The draft Report attempts to avoid this fact by distinguishing between Carson Helicopters, Inc. and Carson Helicopter Services, Inc. ("CHSI") to suggest that no one from CHSI produced the email. Aside from the fact Mr. Boyd worked for both entities, we have repeatedly advised the both the investigators and the Office of General Counsel that Carson intended for our firm to produce the email in response to the NTSB's subpoena. The failure to produce that email in response to the subpoena was inadvertent and the result of an omission by our firm and not Carson. The attempt to characterize it as otherwise is disingenuous and untrue. Nor do the circumstances concerning the production of this email have any relevance to a determination of the probable cause of the accident. Accordingly, we request that any statement implying that this email was not produced by Carson or that Carson sought to withhold it be removed from all NTSB reports.

We would appreciate it if you would provide written confirmation within seven days that neither of these items will be included in any NTSB report.

If you have any questions regarding this matter please feel free to contact me.

Sincerely,



David M. Nadler
Counsel to Carson Helicopters, Inc.

cc: Gary L. Halbert, Esq.

DICKSTEINSHAPIRO LLP

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July 10, 2009

VIA E-MAIL AND FACSIMILE (202-314-6090)

Gary Halbert
General Counsel
National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, DC 20594

Re: NTSB Identification: LAX08PA259
Aircraft: Sikorsky S-61N – N612AZ
Date: August 5, 2008
Location: Weaverville, CA

Dear Gary:

Enclosed is a copy of a letter that Carson has sent today to Thomas Haueter, Director of the NTSB's Office of Aviation Safety. That letter addresses Carson's serious concerns with the investigation and requests that NTSB take certain actions to ensure the integrity of the investigation and to protect public safety. The concerns that are addressed in Carson's letter to Mr. Haueter have previously been raised with the investigative team and were the subject of our meeting with Mr. Chris Julius, NTSB's Assistant Counsel, on June 19, 2009.

As we discussed with Mr. Julius, we are aware that certain anomalies in the helicopter weight data and a performance chart have been identified. However, we are concerned that these anomalies have apparently resulted in a rush to judgment by the investigative team that the accident was necessarily caused by issues related to the weight of the aircraft. In so doing, it appears that the investigative team is shaping its investigation and findings to meet that conclusion, even when presented with substantial evidence to the contrary. While the NTSB's investigative team is consistently overemphasizing issues related to the weight of N612AZ, it is disregarding or minimizing compelling evidence of possible engine failure due to defective fuel control units as a major contributing factor of the accident. Indeed, as discussed in Carson's letter to Mr. Haueter, the most recent draft of the Operations Report omits the prior reference to a loss of power to the rotor system as a possible cause of the accident.

The NTSB's actions are particularly troubling given the serious questions that have been raised with the NTSB about potential destruction or tampering of evidence regarding N612AZ's fuel control units. These fuel control units include the two units recovered from the helicopter after the accident and a unit that had previously been removed from the helicopter. All of these units

were serviced by Columbia Helicopters, Inc. ("Columbia"), the only authorized maintenance facility for these units in the United States and a direct competitor of Carson in the helicopter services industry. The following facts give rise to our serious concerns with the NTSB's handling of the fuel control issue.

At the direction of NTSB, on August 13-14, 2008, the two fuel control units recovered from the accident wreckage were disassembled and inspected at Columbia's overhaul facility in Aurora, Oregon, and were left bagged and shelved at Columbia on August 15, 2008. These units remained in the sole custody of Columbia for several days until, at Carson's insistence, the NTSB directed that they be sent to NTSB Headquarters. An inspection of these units at NTSB Headquarters on August 28, 2008 revealed that they had been packaged by Columbia in two separate boxes, not in their original bags, and were missing numerous parts that had been present during the initial teardown on August 13-14. Many parts critical to any analysis of the role these fuel control units played in the accident were missing from the units shipped by Columbia to NTSB Headquarters. To date, these missing parts have not been located. The boxes shipped to NTSB Headquarters also contained additional parts that were not present when the units were initially disassembled on Columbia's overhaul facility, and other parts which had been switched between the two fuel control units.

Additionally, at the time of the accident, Columbia was in possession of another Carson fuel control unit that had been removed from N612AZ prior to the accident and sent to Columbia for repair. The NTSB requested that this fuel control unit be sent from Columbia to the NTSB investigative team at Hamilton Sundstand (the unit manufacturer) facilities in Connecticut along with any associated inspection and repair documentation. That unit was unpacked in the presence of the NTSB investigative team who discovered that the unit had been completely disassembled, down to the smallest parts, and was literally in hundreds of pieces -- with every individual part stripped and cleaned. The parts were commingled in two plastic bags. The dozens of intricate, small parts from the interior of the fuel control housing were thrown together in these plastic bags in a very haphazard and damaging manner. In addition, there was no paperwork or documentation accompanying this fuel control unit. It was therefore impossible to ascertain when the unit was disassembled or cleaned, or whether any parts had been serviced. The disassembly of this unit makes it impossible to determine the condition of the unit as it was removed from the accident aircraft or the possible reasons for the failure of this fuel control unit to perform properly.

The Materials Lab Report on the fuel control units from N612AZ shows a significant amount of contaminant materials in, and scoring of, the pressure regulating valve ("PRV") of both fuel control units (particularly, the #2 FCU). This type of contamination and physical damage to a PRV can adversely affect the power output of the engine and cause a loss of power similar to that suffered by N612AZ immediately before it crashed. Previous studies of material in PRVs for this fuel control indicate that contamination that collects in the PRV is a clear indicator that contamination is present elsewhere in the fuel control unit, which would compromise engine

performance. The contamination found in N612AZ's PRVs is similar to that found in at least two other instances of fuel control unit failure in units serviced by Columbia.

For example, Transport Canada found that contamination similar to that found in N612AZ's fuel control units caused the PRV to stick and that this was a contributing cause of the Hayes Helicopter Services accident in 2002. Carson also is aware of contamination in another unused unit serviced by Columbia. Carson believes that a power loss caused by contaminant in, and physical damage to, the fuel control unit and PRV valve may have caused the accident. Other information in the possession of the NTSB confirms this conclusion. To the extent that these issues with the fuel control units reflect problems with Columbia's overhaul services or facility, it may present an ongoing public safety concern. In this regard, Carson has offered several times to make available for inspection by the NTSB one fuel control unit that was previously removed from N612AZ and fresh unit that was overhauled by Columbia, but the NTSB has inexplicably declined to inspect these units. We again request that these units be inspected.

As you know, Carson has now twice requested that the NTSB conduct a full investigation of the handling of the fuel control units, and we have also addressed this issue with your office. (*See* Carson letters to Jim Struhsaker dated September 2 and 25, 2008). While you have advised that the NTSB has determined to treat this issue as an "internal" matter, we believe that this is insufficient and again request that your office either conduct a full investigation, or refer the matter to the appropriate authorities, to determine whether evidence has been tampered with or destroyed. 49 U.S.C. § 1131. We make this request with one eye on ensuring the validity and credibility of the NTSB's findings in this investigation and the other on public safety given that many other fuel control units serviced by Columbia are currently in use. Indeed, Columbia operates the only authorized commercial overhaul facility for the fuel control units used in the General Electric CT-58 engine series, which are used in many S-61, H-3 and BV-107/CH46 helicopters in operation today. Columbia-serviced fuel control units are used on helicopters throughout the United States and the world, and any problem with their overhaul facility or processes may create a significant and ongoing threat to aviation safety. Given the NTSB's knowledge of these facts, the implications of another accident due to a defective fuel control unit cannot be overstated. Indeed, we understand that the deficiencies in this investigation are consistent with those that have been raised in other unrelated investigations and, thus, may indicate systemic problems that pose a ongoing threat to aviation safety and undermine the integrity and credibility of the NTSB.[1]

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[1] Another example of the investigative team's apparent bias is its reliance on the unsworn statement of a disgruntled former Carson employee. Despite our objections, the investigative team has made no effort to obtain a response from Carson, or to otherwise validate or corroborate this statement, even though Carson has advised that it is prepared to refute the statement. Similarly, in its latest draft operations report, the investigation team continues to inappropriately highlight a July 7, 2008 email from Carson's John Harris and imply that Carson withheld that email from the NTSB. The email was provided to the NTSB by Robert Boyd in

We are also concerned that the NTSB's investigation has been tainted by undue influence by the Forest Service which has apparently used investigative materials improperly and for punitive purposes. For example, by letter dated February 18, 2009, the Contracting Officer for the Forest Service contract that included N612AZ stated that "I have determined that Carson's noncompliance with the contract clause C-10 and its violation of the Federal Aviation Regulations may have caused or caused or contributed to the crash of N612AZ." We are advised that Forest Service representatives have made similar statements about the weight of the aircraft in public settings, such as industry briefings in Boise, ID.

Aside from the fact that it is the province of the NTSB (not the Forest Service) to determine the cause of the accident, 49 U.S.C. § 1131(a)(1), and that the investigation is not complete, the Forest Service has a vested interest in the outcome of the investigation. Indeed, the Forest Service had operational control of N612AZ at the time of the accident and is being sued by at least one of the families of the accident victims. The Forest Service's admitted preconceived determination that the accident was caused by excess weight, and its apparent improper use of investigative materials to further that conclusion, is consistent with Carson's concerns of similar bias by the investigative team and their disregard of engine failure as the probable cause of the accident. Accordingly, we request that the NTSB conduct a full investigation into whether the investigation has been tainted by the Forest Service[2], that any improper influence by the Forest Service be neutralized, and that the Forest Service be removed as a party from these proceeding, if warranted. *See* 49 C.F.R. §§ 831.11, 831.13.

We appreciate Mr. Julius' kind offer to facilitate a meeting with Carson and the leaders of the investigative team to discuss these issues and would ask that you and Mr. Haueter attend that meeting. Given the serious issues presented in Carson's letter to Mr. Haueter and this letter, pending the NTSB's thorough review of these issues, we respectfully request that the Technical Review meeting presently scheduled for July 30 be deferred. We further request that no investigative materials or finding be made public pending completion of that review. In this regard, please be advised that the release of any investigative materials or findings to the public under these circumstances would cause immediate and irreparable harm to Carson. Accordingly,

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the Fall of 2008. The draft report attempts to avoid this fact by distinguishing between Carson Helicopters, Inc and Carson Helicopter Services, Inc. ("CHSI") to suggest that no one from CHSI produced the email. Aside from the fact Mr. Boyd worked for both entities, we have repeatedly advised your office that Carson intended for our firm to produce the email in response to the NTSB's subpoena. The failure to produce that email in response to the subpoena was inadvertent and the result of an omission by our firm and not Carson. The attempt to characterize it as otherwise is disingenuous and untrue. Indeed, this type of conduct by the investigative team is inconsistent with fundamental notions of fairness and due process, and raises troubling questions about the integrity and objectivity of this investigation.

[2] As you know, a Forest Service employee was among those that died in the accident.

to the extent that the NTSB determines to make public any investigative materials or findings over our objection we respectfully at least 10 days advance notice before it takes such action.

Thank you for your cooperation.

Sincerely,

[redacted]

David M. Nadler
Counsel to Carson Helicopters, Inc.

Copy to:

Thomas Haueter
James Struhsaker
R. Christopher Julius