

National Transportation Safety Board

Office of Research and Engineering

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VIDEO STUDY

February 13, 2026

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A. ACCIDENT

Description: Rotorcraft Inflight Breakup
Location: Hudson River, Adjacent to Jersey City, NJ
Date: April 10, 2025
Time: 1515 Eastern Daylight Time (EDT)
Operator: New York Helicopters Charter, Inc.
Aircraft: Bell 206L-4, N216MH, Serial Number 52296

B. VEHICLE PERFORMANCE SPECIALIST

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C. SUMMARY

On April 10, 2025, about 1515 eastern daylight time, a Bell 206L-4 helicopter, N216MH, crashed into the Hudson River near Jersey City, New Jersey. The commercial pilot and five passengers were fatally injured and the helicopter was substantially damaged. The helicopter departed the Downtown Manhattan/Wall Street Heliport (JRB), New York, New York, about 1450, for a Title 14 *Code of Federal Regulations* Part 91 air tour flight. The helicopter was owned by Meridian Helicopters, LLC and operated by New York Helicopters Charter, Inc. Based on ground witness video evidence, the helicopter was in cruise flight when an inflight breakup occurred, resulting in separation of the tail boom and main rotor from the main fuselage.

1. Introduction

The N216MH inflight breakup event was documented by Federal Aviation Administration (FAA) and ADS-B Exchange third-party Automatic Dependent Surveillance-Broadcast (ADS-B) data, surveillance camera video, cell phone video, photographs, witness statements, and airframe wreckage. Other NTSB specialists gathered additional factual evidence, including weather, structures, airworthiness, operations, and maintenance records. An NTSB vehicle performance specialist was requested to perform a video study and to time align the event flight ADS-B data with a subset of the video data.

2. Objective and Scope of the *Video Study*

The objectives of the study were to 1) identify available video evidence that documented the inflight breakup sequence of events, major component paths, and/or component conditions prior to ground/water impact and 2) time align a subset of the video evidence with the ADS-B data.

3. Summary of Results

Subject to the limitations of actual weather conditions, actual environmental lighting, the distance between the helicopter and the camera sensors, recorded video image resolution, and image content compression, the available video evidence indicates no discernible evidence of 1) a bird strike with the helicopter, 2) one or more components departing from the helicopter prior to the primary inflight breakup sequence, or 3) helicopter-based light sources (e.g., strobe, Pulse Lite, or canopy reflection). The video-based primary inflight breakup sequence is defined by tail boom rotation relative to the fuselage, fuselage rotation relative to the preceding flight path heading, tail boom separation from the fuselage, and main rotor separation from the fuselage.

Ground witness video evidence indicates that after the inflight breakup and prior to water impact, one of the two main rotor blade lengths was 16.3- to 19.3-inches shorter than the nominal blade span. The postulated “flash of light” feature in video frame 668 is an artifact of video compression caused by stale (not updated) white sky background color pixel content carried over from preceding video frame 667, rather than a physical event.

D. DETAILS OF THE INVESTIGATION

1. Video Evidence

This study evaluated 18 video sources that recorded a portion of the N216MH accident flight path. The recorded video content from four (4) cameras that documented portions of the N216MH flight path, inflight breakup, and/or water impact was identified for detailed evaluation. Image frames were extracted from the respective videos in sequential order, cropped to focus on pertinent investigative content, and scaled to preserve the original image aspect ratio. The video file source, image resolution, frame rate, audio sample rate, primary content focus (e.g., pre-breakup, fuselage, main rotor), and Video Study Attachment location of each image sequence summary is listed in Table 1. Evidence from a fifth video was used to document the helicopter fuselage longitudinal position at water impact relative to Hudson River shoreline infrastructure.

The data in Table 1 indicate that video image resolution varied between 568x320 and 3840x2160 pixels, frame rate varied from 15 to 30 frames per second (fps), and three of the five videos included audio content. The recommended viewing method for each image sequence .pdf file in Attachments 1-7 is Adobe Acrobat or Adobe Reader in full screen mode <CTRL-L> with left/right arrow key or mouse wheel inputs to page backward/forward frame by frame.

Table 1: N216MH Video Evidence Summary

Video File Source	Image Resolution	Frame Rate, fps	Audio Sample Rate, kHz	Content Focus	Image Sequence in Attachment
2CAA8EEFA70F20250411131652_album_local_cache.mov	1280x720	20	8	Pre-breakup	1
				Fuselage	2
				Main Rotor	3
Export__F6 - NJRB South Pier PTZ Camera-1_Thursday April 10 2025225649 613bdf6.avi	1280x960	29.97	N/A	Main Rotor	4
IMG_0243.MOV	2160x3840	30	44.1	Main Rotor	5
				Birds / Debris	6
RingVideo_20250412_092418.mov	568x320	24	48	Breakup	7
Export__205 NJLB NE PTZ_Thursday April 10 2025230457 4fe20b7.avi	1920x1080	15	N/A	1:34.027 fuselage impact	N/A

Exemplar field of view images extracted from each video source file listed in Table 1, excluding image content cropping and scaling features, are presented in Figures 1 through 5, respectively.



Figure 1: Exemplar N216MH image (1280x720 pixels, encoded date and time, as recorded distortion, 20 fps) extracted from source video 2CAA8EEFA70F20250411131652_album_local_cache.mov. Helicopter direction of travel is left to right. The same source video was used to construct the cropped and zoomed image sequence content shown in Attachments 1-3.



Figure 2: Exemplar N216MH main rotor blade image (1280x960 pixels, encoded date and time, 29.97 fps) extracted from source video Export__F6 - NJRB South Pier PTZ Camera-1_Thursday April 10 2025225649 613bdf6.avi. The same source video was used to construct the cropped and zoomed image sequence content shown in Attachment 4.

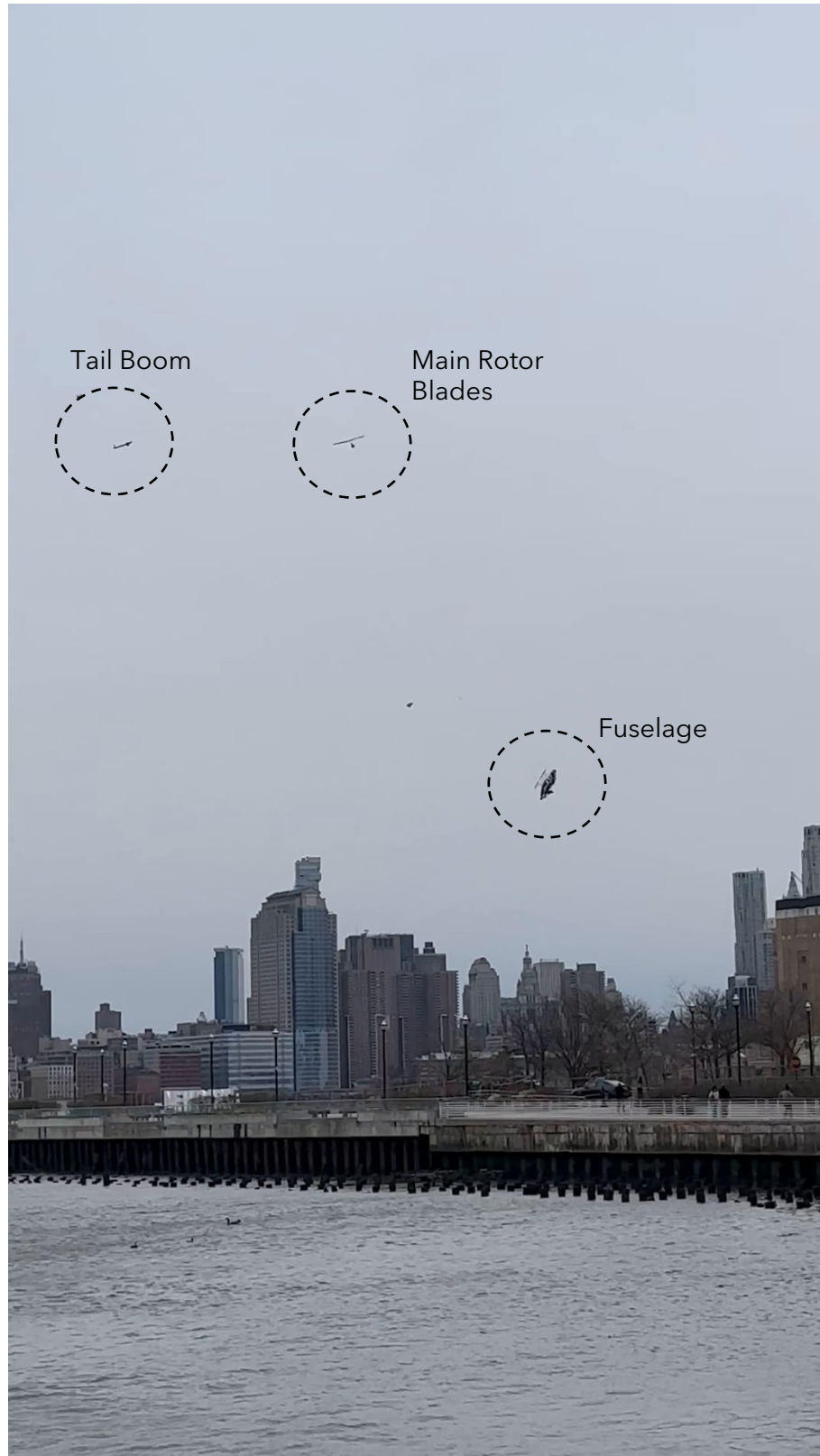


Figure 3: Exemplar N216MH fuselage, main rotor blades, and tail boom image (2160x 3840 pixels, 30 fps) extracted from source video IMG_0243.MOV. The same source video was used to construct the cropped and zoomed image sequence content shown in Attachments 5 and 6.



Figure 4: Exemplar N216MH image (568x320 pixels, as recorded distortion, 24 fps) extracted from source video RingVideo_20250412_092418.mov. Helicopter direction of travel is left to right. The same source video was used to construct the cropped and zoomed image sequence content shown in Attachment 7.



Figure 5: Exemplar N216MH image (1920x1080 pixels, 15 fps) extracted from source video Export_205 NJLB NE PTZ_ Thursday April 10 2025230457 4fe20b7.avi. This image frame was used to define the helicopter fuselage longitudinal position at water impact relative to Hudson River shoreline infrastructure.

2. Inflight Breakup Sequence

The source video for Figure 1 and Attachments 1–3 was used to document the helicopter breakup sequence and timing. The results in Table 2 identify the primary events in chronological order, including the corresponding image sequence summary frame, video frame, video time in HH:MM:SS.00 format, delta time between events in seconds, and time calculation method. The data in Table 2 indicate that tail boom, main rotor, and fuselage separation were completed about 3.65 seconds after the initial tail boom rotation event.

Table 2: N216MH Inflight Breakup Event Sequence (based on Attachment 1 & 2 images)

Event	Frame Image / [Video]	Video Time HH:MM:SS	Delta Time, Seconds	Time Calculation
N216MH enters frame	040 / [439]	00:00:21.95	-11.15	-223 frames x 0.05 seconds
Initial tail boom rotation	263 / [662]	00:00:33.10	0.00	Reference time
Initial fuselage heading rotation	266 / [665]	00:00:33.25	0.15	3 frames x 0.05 seconds
Tail boom separation	294 / [693]	00:00:34.65	1.40	28 frames x 0.05 seconds
Main rotor separation	336 / [735]	00:00:36.75	2.10	42 frames x 0.05 seconds
Fuselage water impact	415 / [814]	00:00:40.70	3.95	79 frames x 0.05 seconds
Tail boom water impact	491 / [890]	00:00:44.50	3.80	76 frames x 0.05 seconds
Main rotor water impact	518 / [917]	00:00:45.85	1.35	27 frames x 0.05 seconds

3. Main Rotor Blade Length Estimate

The NTSB *Airworthiness Group Chair's Factual Report* documents a missing main rotor blade tip length of about 21 inches. The nominal main rotor blade radius was assumed to be 18.5 feet. The source video for Figure 3 and Attachments 5–6 was used to track the descent path of the main rotor blades and extract frames when 1) both apparent main rotor blade tips were visible and 2) the main rotor blades were most closely aligned to the image plane. Image blade content was measured in the three image subsets shown in Figures 6–8 (which correspond to Attachment 5 frames 29, 33, and 37). The source video evidence and measurement data in Table 3 indicate that the two main rotor blade length estimates were consistently unequal prior to water impact, with the shorter blade length estimate varying between 16.3 and 19.3 inches less than the longer blade length.

Table 3: Calculated Main Rotor Blade Lengths (post-breakup and prior to water impact)

Frame & Figure #	Left Blade units	Right Blade units	max(L,R)/18.5 ratio	min(L,R)/max ratio Shorter blade length feet	18.5-min_value Est. missing tip feet	18.5-min_value Est. missing tip inches
29 / 6	9670	10434	564.0	17.15	1.35	16.26
33 / 7	12966	11837	700.9	16.89	1.61	19.33
37 / 8	13692	14818	801.0	17.09	1.41	16.87

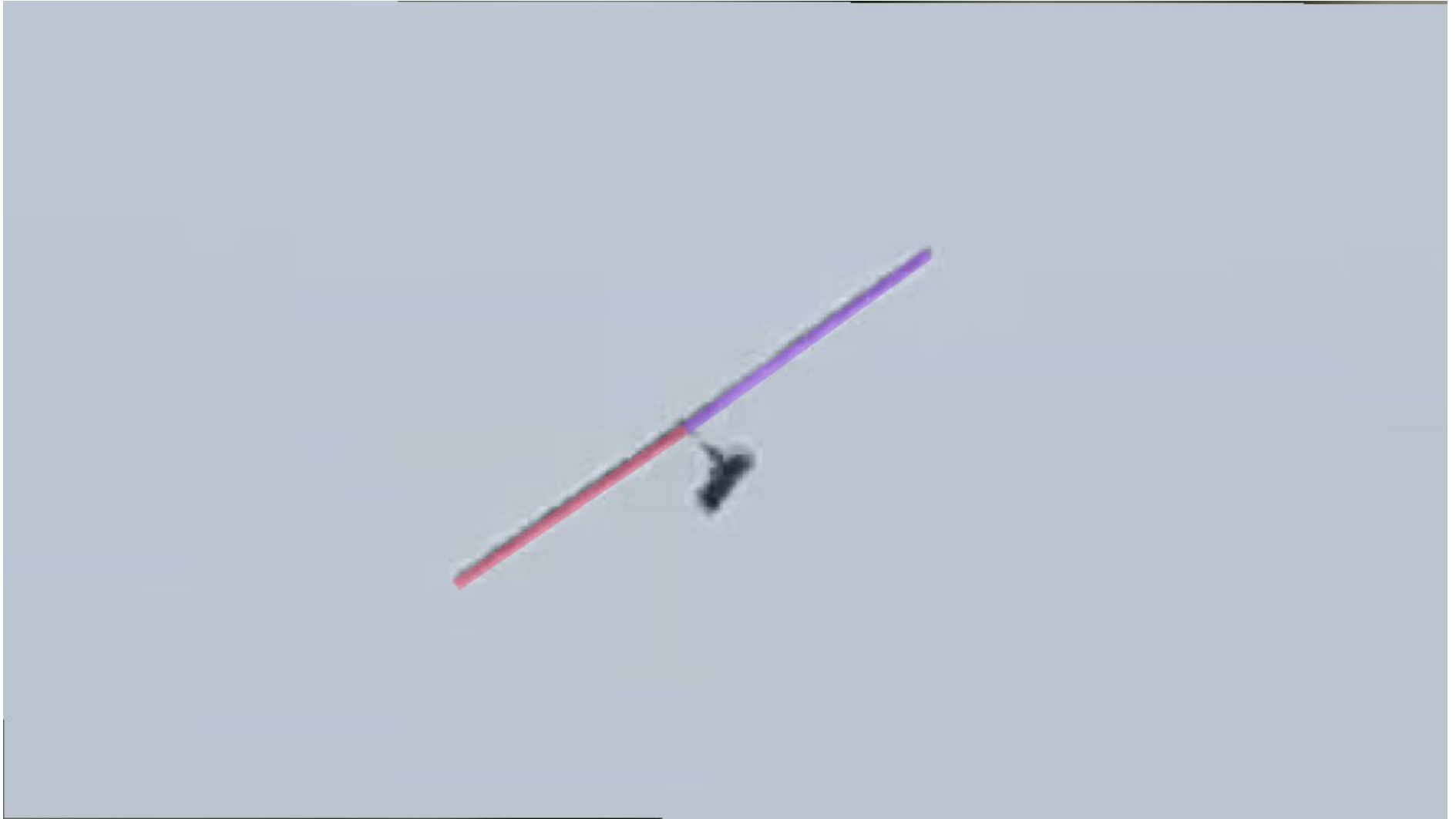


Figure 6: Exemplar frame 29 image subset showing N216MH main rotor blade (zoomed in and cropped from original 2160x3840 pixel image source) annotated with red and purple lines to estimate respective blade lengths.



Figure 7: Exemplar frame 33 image subset showing N216MH main rotor blade (zoomed in and cropped from original 2160x3840 pixel image source) annotated with red and purple lines to estimate respective blade lengths.



Figure 8: Exemplar frame 37 image subset showing N216MH main rotor blade (zoomed in and cropped from original 2160x3840 pixel image source) annotated with red and purple lines to estimate respective blade lengths.

4. Video “Flash of Light” Feature

The source video for Figure 1 and Attachments 1–3 also includes a postulated “flash of light” feature that could be associated with 1) an actual helicopter light source (e.g., strobe light, Pulse Lite, light reflection from the helicopter canopy/window/windscreen) or 2) a video compression artifact. A pixel comparison feature of the ADAPT video player was used to evaluate content of source video frames 667 and 668. The Help documentation distributed with the ADAPT video player includes the following description of the pixel comparison feature:

Compare In/Out: After selecting both In and Out positions on the timeline, the Compare In/Out button becomes active. This feature enables visual comparison of the two marked frames, highlighting any differences between them. The comparison process analyzes the RGB values of each pixel in the In frame and compares them to the corresponding pixels in the Out frame. The results are displayed in the fourth quadrant as a difference map, where white areas represent differences and black areas show pixels with identical RGB values. This tool enables detection of even small visual discrepancies between frames, making it valuable for tasks that require precise visual analysis.

Video content in frames 667 and 668 are compared in Figures 9 and 10. Frame 667 is shown in the lower left with a zoomed in subset of frame 667 content (upper left) compared to a zoomed in subset of video frame 668 content (upper right). Frame content differences are shown in the lower right pane. Black pixels in the lower right region identify pixel content that is identical between the adjacent video frames. The frame 668 pixel content mapping to the candidate “flash of light” is the result of stale (not updated) white sky background pixel content outlined in red (upper left) and shaded in red (upper right) carried over from video frame 667 to video frame 668.

Similarly, video content in frames 668 and 669 are compared in Figure 11. Frame 668 is shown in the lower left with a zoomed in subset of frame 668 content (upper left) compared to a zoomed in subset of video frame 669 content (upper right). Frame content differences are shown in the lower right pane. Black pixels in the lower right region identify pixel content that is identical between the adjacent video frames. The frame 668 stale pixel content mapping to the candidate “flash of light” is updated in video frame 669.

In summary, the apparent “flash of light” in frame 668 is due to pixels in the red shaded area that were not updated from frame 667 and therefore remained the white (sky background) color, resulting in what appears to be a “flash of light” for one frame. This “flash of light” is an artifact of video compression caused by the stale (not updated) white sky background pixel content rather than a physical event.

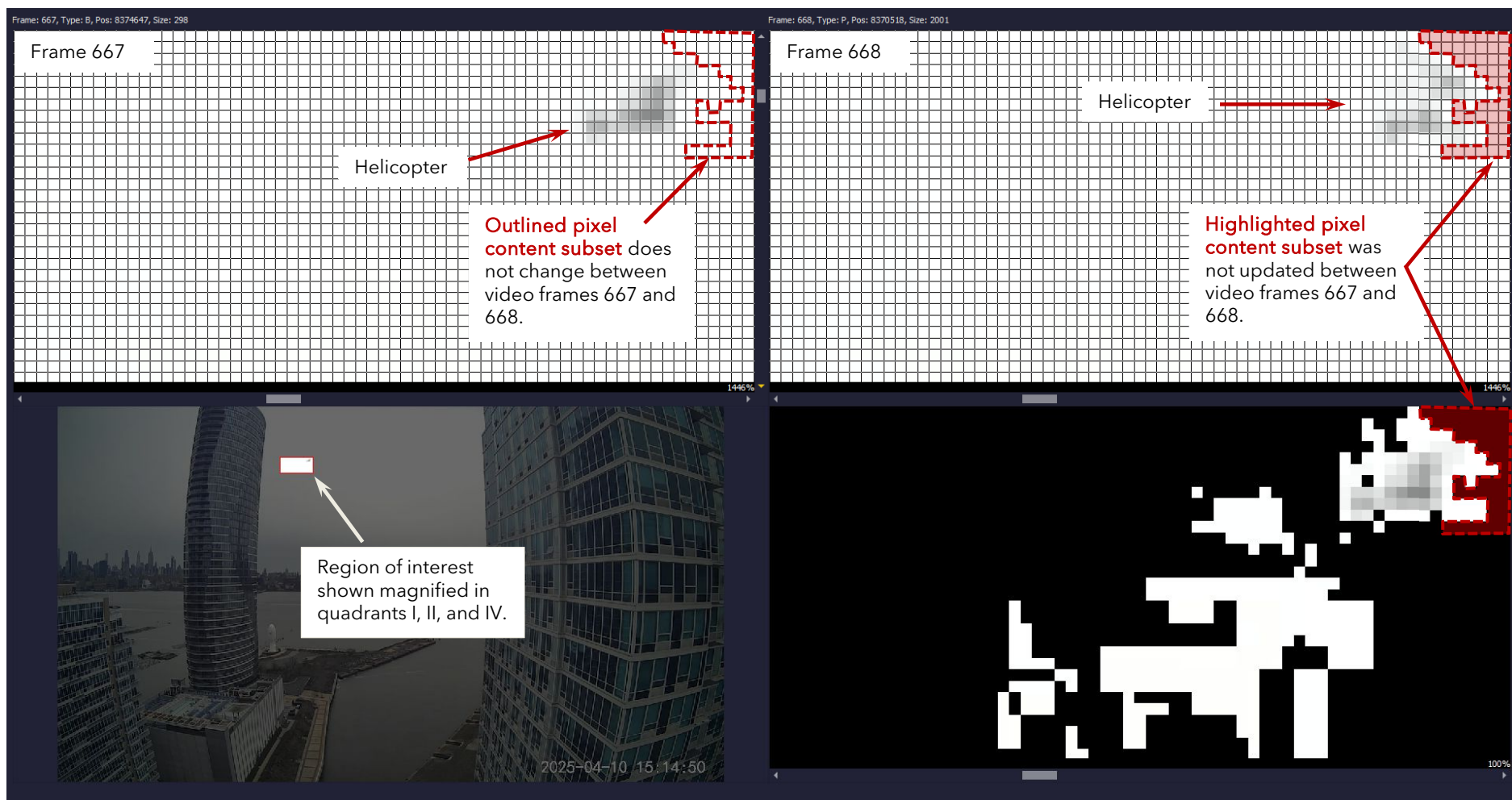


Figure 9: Exemplar video frame 667 image (lower left) with zoomed in subset (upper left) compared to zoomed in subset of video frame 668 content (upper right) and content update differences (lower right). Black pixels in the lower right region identify pixel content that was not updated between adjacent video frames. The frame 668 pixel content mapping to the candidate "flash of light" is the result of stale (not updated) white sky background pixel content outlined in red (upper left) and shaded in red (upper right) carried over from video frame 667 to video frame 668.

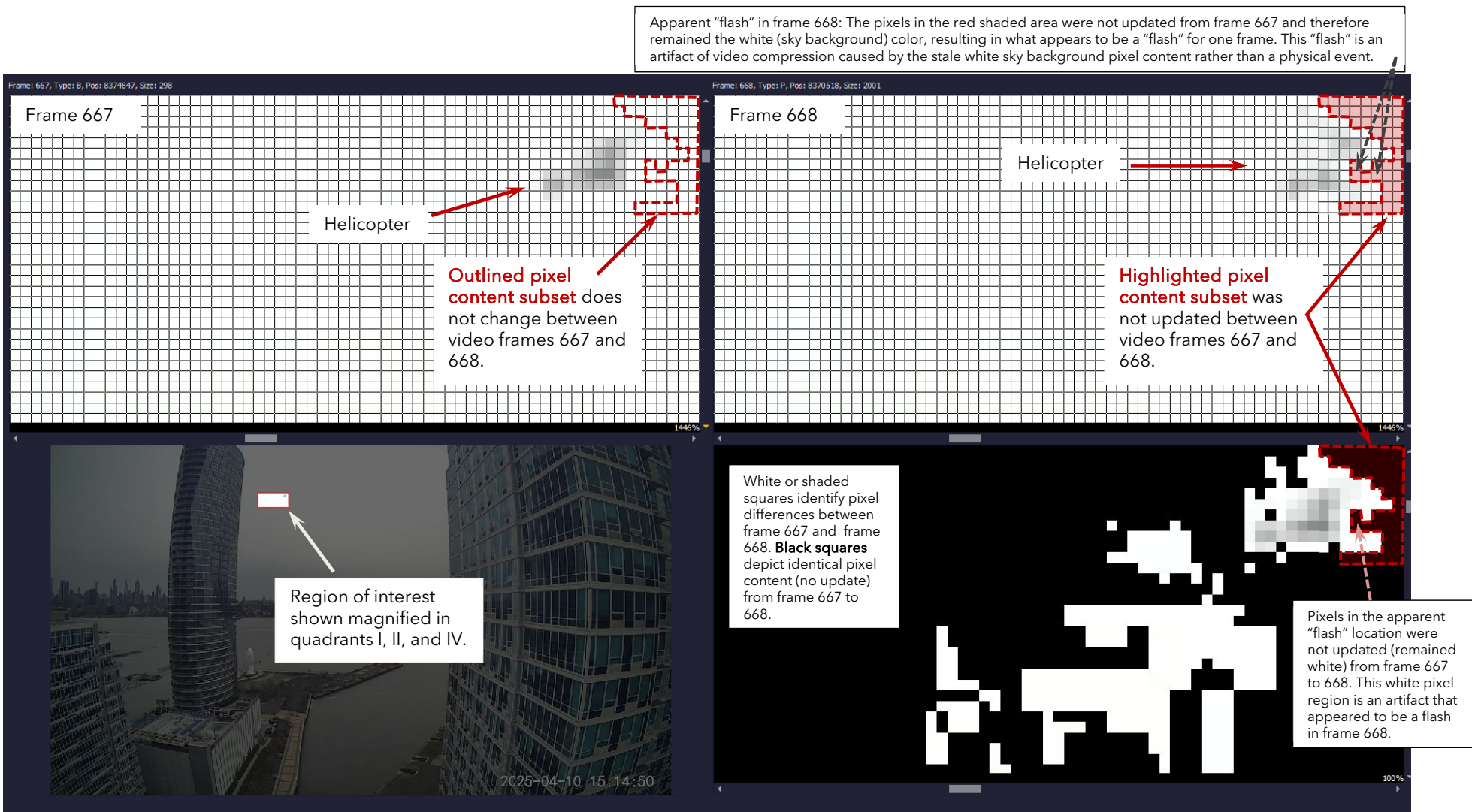


Figure 10: Exemplar video frame 667 image (lower left) with zoomed in subset (upper left) compared to zoomed in subset of video frame 668 content (upper right) and content update differences (lower right). Black pixels in the lower right region identify pixel content that was not updated between adjacent video frames. The frame 668 pixel content mapping to the candidate "flash of light" is the result of stale (not updated) white sky background pixel content outlined in red (upper left) and shaded in red (upper right) carried over from video frame 667 to video frame 668

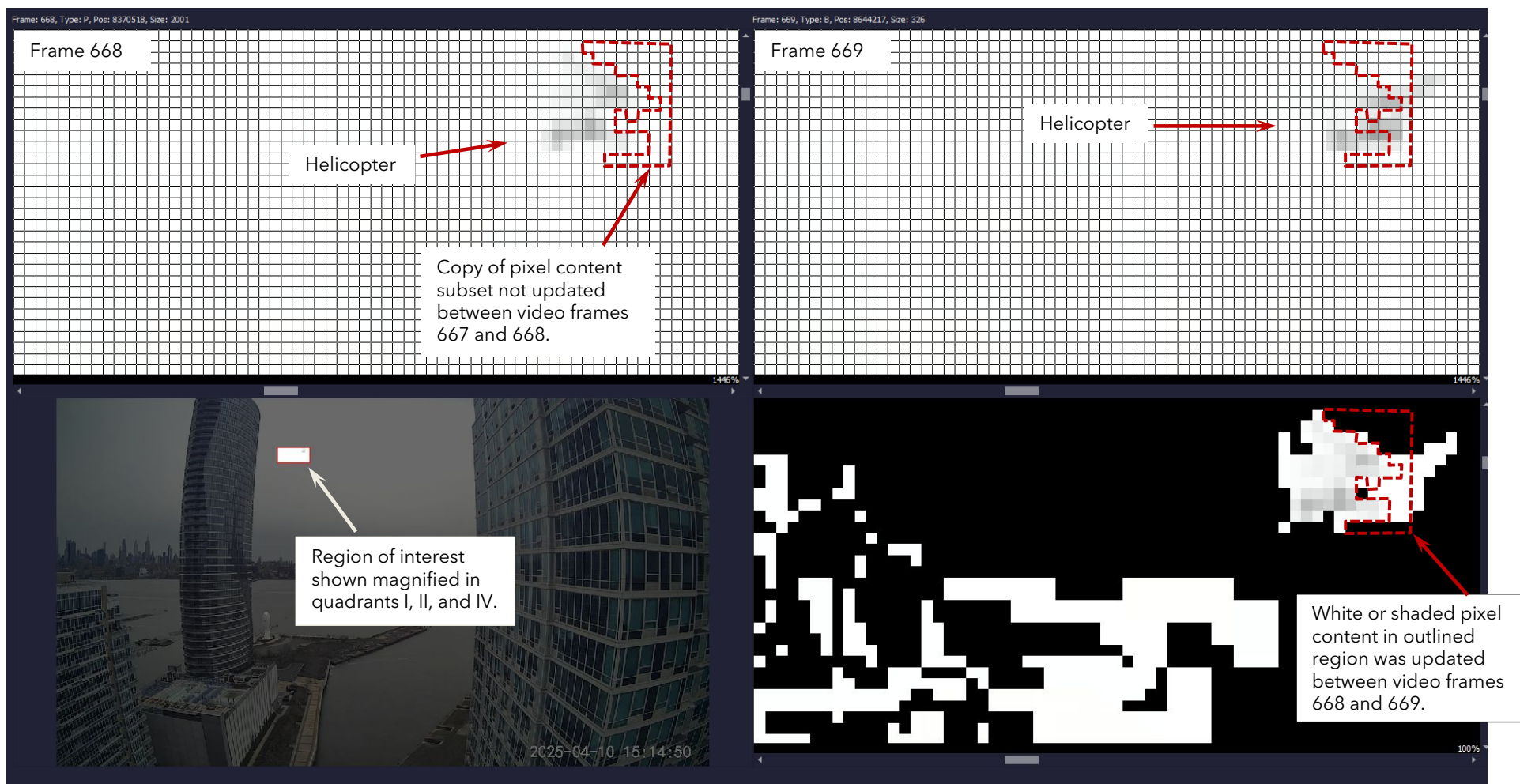


Figure 11: Exemplar video frame 668 image (lower left) with zoomed in subset (upper left) compared to zoomed in subset of video frame 669 content (upper right) and content update differences (lower right). Black pixels in the lower right region identify pixel content that was not updated between adjacent video frames. The frame 668 stale pixel content mapping to the candidate “flash of light” is updated in video frame 669.

5. Time Alignment of Video and ADS-B Data

Two-dimensional ADS-B parametric data plots illustrating N216MH latitude, longitude, altitude, and groundspeed as a function of elapsed time in seconds are provided in Attachment 8. Based on the N216MH inflight breakup event data in Table 2, the elapsed time between N216MH entering the Figure 1 video frame (traveling left to right) and the fuselage impacting the water was 18.75 seconds. The last ADS-B data point recorded N216MH at a geometric altitude of 25 feet and a groundspeed of 34.4 knots. The helicopter fuselage descent rate at this time was about $[(350 - 25) \text{ feet}] / [2.86 \text{ seconds}] = 113.6 \text{ feet/second}$. The estimated time to water impact is $25 \text{ feet} / 113.6 \text{ feet/second} = 0.22 \text{ seconds}$ (or 4.4 image frames). The helicopter absolute position 18.75 seconds prior to water impact was calculated by interpolating the latitude/longitude position $18.75 - 0.22 = 18.53$ seconds up range of the last ADS-B data point. The length of the yellow shaded region adjacent to the N216MH flight path in Figure 12 represents 18.75 seconds of travel time along the corresponding ground track. Table 4 documents the calculated time alignment based on the fuselage water impact event (see supporting evidence in Video 1, Figure 1, and Attachments 1-3).

Table 4: Calculated time alignment based on the fuselage water impact event

Alignment Event Video 1, Figure 1	Elapsed Seconds	ADS-B Data hh:mm:ss.00	Video Time Code Estimated hh:mm:ss.00	Video Elapsed Time hh:mm:ss.00
Fuselage Impact	69295.32	15:14:55.32	15:14:58.06	00:00:40.70

E. FINAL SUMMARY

Subject to the limitations of actual weather conditions, actual environmental lighting, the distance between the helicopter and the camera sensors, recorded video image resolution, and image content compression, the available video evidence indicates no discernible evidence of 1) a bird strike with the helicopter, 2) one or more components departing from the helicopter prior to the primary inflight breakup sequence, or 3) helicopter-based light sources (e.g., strobe, pulse, or canopy reflection). The video-based primary inflight breakup sequence is defined by tail boom rotation relative to the fuselage, fuselage rotation relative to the preceding flight path heading, tail boom separation from the fuselage, and main rotor separation from the fuselage.

Ground witness video evidence indicates that after the inflight breakup and prior to water impact, one of the two main rotor blade lengths was 16.3- to 19.3-inches shorter than the nominal blade span. The postulated "flash of light" feature in video frame 668 is an artifact of video compression caused by stale (not updated) white sky background color pixel content carried over from preceding video frame 667 rather than a physical event.

F. ATTACHMENTS

- Attachment 1: Pre-Breakup Image Sequence
- Attachment 2: Fuselage Track Image Sequence
- Attachment 3: Main Rotor Track Image Sequence
- Attachment 4: Main Rotor Water Impact Image Sequence
- Attachment 5: Main Rotor Detailed Image Sequence
- Attachment 6: Birds or Debris Image Sequence
- Attachment 7: Ring Camera Image Sequence
- Attachment 8: ADS-B Data Plots



Figure 12: Planform view showing N216MH flight path, ground track, time alignment (with Video 1, Figure1, and Attachment 1-3 content), and helicopter fuselage, main rotor, and tail boom component recovery locations. The helicopter direction of travel was North (top of page) to South. The length of the yellow shaded region adjacent to the ground track corresponds to 18.75 seconds of flight time prior to fuselage water impact.