Event Type: Crew Carrier Rollover

Date: June 25, 2023

Location: Glenwood, New Mexico (5 miles south)

Executive Summary

On June 25, 2023, a wildland fire crew carrier vehicle (CCV) was involved in a single vehicle accident. The vehicle, capable of carrying nine passengers, though only eight crew members were on board, veered off the road to the right, on a downhill grade. The driver corrected the vehicle back on to the pavement but the momentum of the vehicle combined with road conditions resulted in the vehicle rolling on to the driver's side and eventually coming to rest upside down. The crew carrier was one of four vehicles traveling together, assigned to preposition for wildland fire suppression. The eight individuals were evaluated on scene and later evaluated at a medical facility. Minor injuries occurred. The crew returned to their home unit the following day.

Narrative

On Thursday, June 22, an Interagency Hotshot Crew (IHC) was ordered to respond to the Post Fire southwest of Benson, AZ. The crew arrived on scene the same day, tied in with the wildland fire Incident Management Team (IMT) and began fire suppression efforts. The crew worked the following day on the incident and was released at end of shift and remained overnight in Tucson, AZ. On Saturday, June 24, the crew was reassigned to preposition in Quemado, NM. Due to the time of day the order was processed, the crew traveled to Silver City, NM and secured lodging for the night. The morning of July 25, the crew was reassigned again to preposition at Luna Work Center. At approximately 0830, the crew departed Silver City, NM enroute to Luna, NM.

At approximately 0930, while traveling on a downgrade "S" curve, on a two-lane highway, crew carrier 2 (C2), carrying eight personnel, veered off the road on the outside curve striking a road sign. The driver of the vehicle was able to steer the vehicle back on to the highway, crossing into the oncoming lane. The vehicle rolled over on to the driver's side and slid approximately 45 feet, coming to rest upside down and partially into the oncoming lane of traffic.

A crew chase vehicle with two individuals, traveling at a safe following distance directly behind C2, witnessed the incident and immediately responded. Crew carrier 1 (C1), traveling ahead of C2, saw a cloud of dust and immediately stopped, turned around and responded to the incident. Crew members contacted the crew supervisor, traveling ahead of the crew carriers, and he turned around and responded.

The chase vehicle and civilian responders immediately stopped to assist C2. The crew carrier compartment is equipped with 5 safety exits. One exit, on the top of the vehicle, was inaccessible. The main exit door to the rear of the crew carrier compartment was blocked by shelving that broke loose within the crew compartment and slid into the aisle. The driver and front passenger were able to exit the vehicle through their respective doors. Responders looked through the windows of the crew compartment and saw crew members seat belted in and upside down. With concern for the individuals within, responders broke two crew carrier windows to gain access to the crew compartment and provide an immediate exit for personnel. Two crew compartment personnel's seatbelts were cut to allow the individuals to exit the compartment. C1 arrived on scene and immediately began traffic control and provided immediate first aid to individuals from C2. Civilian responders also provided immediate first aid to personnel from C2 and remained on scene to assist. One civilian responder cut the seat belt of a crew member within the crew compartment, allowing him to exit the compartment through a window. All personnel, within the crew compartment, exited the vehicle via broken windows.

Crew management contacted their home unit supervisor and made initial accident notification. Within forty-five minutes, notifications were made to dispatch, the home unit, regional office, and national office. An email was sent to the Indian Affairs (IA)-Early Alert email group regarding the incident, stating additional information will be forwarded as received.

Local emergency services and fire department arrived on scene at approximately 1000 hours. All personnel

involved were evaluated on scene by local EMS and were later evaluated at a medical facility. Only minor injuries (cuts, scrapes, bruises) were reported. Crew supervisors worked with local management to arrange transport of individuals and gear back to Silver City, NM. The crew carrier was up righted and transported via tow company, to Silver City. All crew members involved were evaluated at a medical facility and released the same day. The crew remained overnight in Silver City and returned to their home unit the following day.

Lessons Learned Review (LLR) Activation

On the morning of June 25, within less than an hour after the incident, the appropriate accident notifications were completed. A conference call with senior management was arranged for 1200 hours. A decision was made to initiate a Lessons Learned Review. The LLR, along with the Early Alert and 72-hour expanded report would serve as a commensurate accident investigation. The LLR team was selected and regional office management created name request resource orders. The LLR team consisted of a Natural Resource Specialist from BIA NIFC, two subject matter experts (SMEs) from the BLM's National Fire Equipment Program at BLM NIFC, and two Regional Safety Managers (BIA Western Region and BIA Southwest Region).

On Monday, June 26, the LLR team arrived in Phoenix, AZ and met with senior Western Regional management and traveled to the home unit of the IHC crew.

On the morning of Tuesday, June 27, the team in-briefed with the Agency Superintendent, Regional FMO, Regional AFMO, Unit FMO, Unit AFMO, Crew Superintendent, as well as Tribal wildland fire program management. The team met with all members of the IHC crew and conducted interviews with all personnel involved. The team later traveled to Silver City, NM to view the crew carrier vehicle. SMEs conducted a thorough review of the vehicle and the team met with the tow truck operator. Through assessment of the vehicle, photos taken at the scene, interviews, witness statements, and speaking with the tow truck operator, it was determined the vehicle rolled on to the driver's side of the vehicle, then rolled on to the top of the vehicle coming to rest upside down. Additional damage, earlier believed to be a result of the crew carrier rolling completely over once or more, was determined to have been the result of up righting the vehicle during recovery.

On the morning of Wednesday, June 28, the team traveled to the scene of the accident, approximately one hour north of Silver City, NM. The accident occurred on a downgrade section of a two-lane highway, at an "S-Curve." The first curve consisted of a sweeping curve to the right, followed by a curve back to the left, placing the crew vehicles on the outside curve at the scene of the accident. The section of highway was clearly posted with downgrade and curve signage prior to the location of the accident, as well as a recommended speed limit of 35 MPH through the curves. Assessment at the scene of the accident indicated that the crew carrier right rear dually tire(s) exited the roadway, causing the rear of the vehicle to pull hard to the right. The

crew carrier "clipped" a directional arrow sign and the driver immediately steered the vehicle back onto the roadway, into the oncoming lane of traffic. The driver attempted to correct the direction of travel by steering back to the right. The momentum of the vehicle caused the vehicle to swerve to the right and roll over on to the driver's side. The vehicle slid for approximately forty-five feet on the driver's side, then rolled over on to the roof of the vehicle and came to rest partially blocking the opposite side of the highway, opposite the direction of travel. Distance from the location the vehicle's right rear tire(s) came off pavement to the vehicle coming to rest was approximately two hundred and twenty feet. Witness reports and individuals interviewed stated that speed was not a factor in the accident.

Lessons Learned Review

The purpose of a LLR is to explore, investigate, or review unintended outcomes or near misses to learn from the event and prevent future occurrences. In order to learn from these events, it is imperative to conduct a LLR in an open, non-punitive manner. LLRs are intended to provide educational opportunities that foster open and honest dialog and assist the wildland fire community in sharing lessons learned information. LLRs provide an outside perspective with appropriate technical experts assisting involved personnel in identifying conditions that led to the unexpected outcome and sharing findings and recommendations.

Findings and Discussion

Finding 1. Condition of the vehicle. The crew carrier had been in service for less than two years and had less than 30K miles on the odometer. Service records were up to date and were in order. Tires were in good condition and showed no signs of uneven wear or unserviceability.

Discussion: The driver of the crew carrier, who has worked on the crew for four years and has been a driver of the crew carrier for the last four months, reported that the vehicle normally pulled slightly to the right. This had not warranted taking the vehicle in for service, as this was reported as "slight."

Finding 2. Fatigue of the crew/driver. The crew was in their first week of their fourth "roll" of the season. During this assignment, the crew had worked two days on a wildfire before demobilizing and remaining overnight in Silver City, NM, the evening prior to the accident.

Discussion: Recent work schedule of the crew/driver, fatigue, was not noted as a factor in the incident.

Finding 3. Road Conditions. The section of highway where the accident occurred had recently been repaved. The original pavement, combined with the new pavement, created a measurement of approximately nine inches from the top of the pavement to the dirt/gravel shoulder. The distance from the outside edge of the white line to the shoulder was approximately twenty inches. The lane of travel measured approximately nine and a half feet and the width of the crew carrier measured approximately eight and a half feet.

Discussion: The condition of the road surface was excellent. However, the narrow width of the lane of travel, combined with the width of the vehicle, left little margin for error to stay in the lane when traveling around the curve. Oncoming traffic, or the

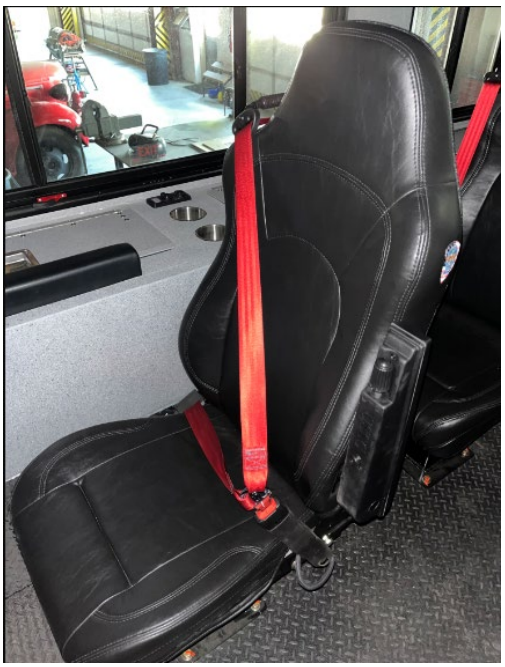
possibility of oncoming traffic would naturally incline a driver to steer as far right in their own lane as possible. The height variation between the road surface and the shoulder was a factor in the incident, when the right rear dually tires exited the road surface onto the shoulder. The combination of the shoulder height, height of the old pavement, and height of the new pavement created a step affect which could easily pull the dually tire(s) on to the shoulder if the vehicle moved slightly off the new pavement.

Finding 4. Speed of the vehicle. Both witness statements from bystanders and crew members noted that speed was not a factor. The driver of the crew carrier stated he was driving less than forty MPH.

Discussion: The crew carrier is a larger passenger vehicle capable of transporting nine individuals and gear, in response to wildland fire incidents. Crew carriers do not require commercial driver's licenses (CDLs), though they are equipped with air brake braking systems. The crew carrier is also equipped with a "Jake Brake," and when activated, is designed to slow the vehicle by opening exhaust valves to the cylinders. The driver stated he generally activates the "Jake Brake" system, but in this instance the system was not turned on.

Finding 5. Insufficient securing of crew compartment storage locker and potential for additional injury.

Discussion: The crew compartment storage locker in the rear of the passenger area of the CCV broke loose from its location during the accident. This locker normally stores approximately three hundred pounds of miscellaneous firefighting equipment and gear. Had an additional passenger been sitting in the rear-most seat of the CCV, they would have been impacted by the locker, which could have resulted in more serious injuries. Once the locker broke loose of its location, it also blocked the primary exit route of the vehicle post-accident, which also made removing passengers from the vehicle more difficult.



Finding 6. Recent vehicle engineering modifications improved passenger safety.

Discussion: The CCV is part of a recently awarded manufacturing contract which included extensive testing for crush ratings of the rear passenger compartment, as well as rollover protection. Improvements were made, including the frame of the CCV box was built stronger to withstand higher impacts, higher seatbacks were installed for more head and neck protection during an accident, and three-point seat belt harnesses were installed for rear passengers. These improvements likely resulted in a positive outcome, when compared to past CCV vehicle rollover incidents.

Finding 5. Restraint systems. All occupants of the vehicle were wearing seat belts. All seats were equipped with three-point seat belt systems. When the vehicle came to rest, responders saw occupants upside down within their seats.

Discussion: Two individuals, within the crew carrier compartment, had slid the shoulder belt portion of the seat belt system behind them. Though no additional injuries were noted by these two individuals, one of the individuals got tangled up in the seat belt when the buckle was released, and the individual attempted to exit the vehicle. This required cutting of the seat belt to allow the occupant to exit the vehicle. Another individual's seat belt, within the crew compartment, required cutting. Individuals were hanging upside down when the vehicle came to rest, so tension was continually on the belts. It is clear, wearing of seat belts was a key factor resulting in only minor injuries during this incident.

Lessons Learned

- Response to wildland fire will require vehicle travel by a wide range of equipment and over roadway systems of varying conditions. When conditions are out of the ordinary, all necessary steps should be implemented for safe travel. At times, it may be necessary to drive well below the recommended safe travel speed.
- All safety equipment, including braking systems and restraint systems, should always be utilized fully and as designed to maximize safety.
- Improvements in engineering modifications have resulted in safer wildland fire equipment.
- An Equipment Bulletin has been issued and instructions have been provided to secure the storage cabinet within the crew compartment of the CCV.

Commendations

- Crew's quick actions regarding scene safety for both the crew and public during the incident.
    - Traffic control, use of safety triangles, safety vests, and handheld traffic signs were instrumental in improving safety during the incident.
- Crew's response to their own Incident Within an Incident (IWI).
    - The crew has obviously trained on IWI protocols and response and acted accordingly.
    - Incident Command was set up, patient triage occurred in a timely manner, scene safety was initiated, and proper and immediate notifications took place to all relevant parties.
- Local fire management officials at the home unit worked quickly with Regional, National, and Interagency partners to conduct an immediate response to the incident.
    - Program managers did not hesitate to communicate with senior management to initiate the most appropriate response.
- Program managers welcomed the LLR team and fully participated during the LLR.
- IHC crew management prioritized interviews and LLR interaction, allowing for open and honest dialogue and discussion.

LLR Team Closing Comments

- Seat Belts Save Lives. On more than one occasion this year, fire personnel have been involved in vehicle rollover accidents. And on more than one occasion, personnel have walked away with minor injuries having been wearing seat belts. Safety restraint systems should be worn at all times and should be worn appropriately and as designed to maximize safety.

LLR Team Members

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