



NAVAL SAFETY COMMAND SAFETY AWARENESS DISPATCH



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Aircraft Towing and Towing Equipment Mishaps

Towing aircraft and using tow equipment is inherently dangerous and can be costly. Mishap data that included towing or was tow-equipment related over the past 5 years showed over 300 incidents amounting to more than \$30 million in damages. Add to that, Sailors and Marines being sidelined with injuries. Read and share these examples of towing gone wrong with your teams to avoid similar consequences.



- The Move Crew Did Almost Everything Right. The move crew was about to move the aircraft out of the hangar onto the flight line. They were appropriately manned with qualified and current people; they briefed the move; they cleared multiple moveable obstacles from around the aircraft; they opened the hangar doors—it all seemed to be going so well. Within 5 seconds of commencing the move, the starboard stabilator passed over the open lid of a hangar ground power station that stood about 1.5 feet taller than the lowest point on the stabilator, causing over \$1 million in damages. —*The open lid went unchecked after the other equipment was removed from around the aircraft. The move was done at night with overhead hangar lighting as the only light source, and consequently, the aircraft cast a shadow over the ground power station. The power station is a common permanent fixture, so it wasn't noticed as being in the way, factoring into why it was overlooked. The move director did not complete a walkaround before starting the move (the last step of the move checklist). Bottom line, every step in the checklist is there for a reason and needs to be completed, not 'almost' every step - a costly mistake.*

- Stuck the Landing, but Not the Move. After declaring an in-flight emergency, a pilot made an uneventful safe landing, taxied to the taxiway and shut down the engines, concerned with overheating. He then secured the aircraft, including setting the parking brake, and hopped out. —*Whew, dodged that potential mishap! You'd hope the worst part of his day is over...but.* The airfield crash fire (CF) lead met the pilot at the aircraft, and they discussed towing the aircraft to the ramp to clear the taxiway. The CF tow crew arrived without a brake rider and were unfamiliar with towing this type of aircraft. The pilot agreed to be the brake rider. When he disengaged the parking brake, he mistakenly didn't turn on the battery first, so the brakes remained on, but the team was unaware. The excessive force used to pull the aircraft (with brakes on) caused the nose gear of the aircraft to collapse onto the tow bar, shearing it. The nose of the aircraft came to rest on the tarmac. The cost was almost \$1 million in damages. —*As the report put it, this evolution was a "new/unusual procedure" for both the pilot and tow crew. The pilot had done only power-on moves before, not riding brakes during a non-powered tow. The tow crew was experienced in towing multiple aircraft types, but not this type. Add to the factors mentioned above, all involved felt a perceived pressure to clear the taxiway. Yet, there was NO risk mitigation discussion, NO formal tow brief and NO qualified brake rider present. There was NO formalized tow checklist available (for pilots to ride brakes during tows) and NO formal tow training for pilots; their extensive formalized training didn't cover it. Nonetheless, had the move team engaged in an Operational Risk Management (ORM) discussion (a process already in-place), it would have identified knowledge gaps, prompted risk mitigation and likely ended with a better outcome.*

- Don't Use That Tow Tractor! During a Foreign Object Debris (FOD) walkdown, a spring was found that was soon identified to be from the accelerator pedal of a tow tractor assigned to another squadron. That squadron's Maintenance Control (MC), Quality Assurance (QA), and the work center (WC) who had custody of the tow tractor were all notified the tractor was unsuitable for use. —*A system working as intended, excellent! Now, here's where things go bad.* At the squadron with the broken tractor, maintainer 1 (M1) needed a tractor for an aircraft move. The WC lead told him that the only useable tractor was already checked out and on the flight line to move ground support equipment (GSE). Despite being told about the accelerator and that it shouldn't be used, M1 then looked over the broken tractor and determined it was 'good' enough to move GSE but not to move an aircraft. So, he took the tractor to the flight line to swap it out

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with the working tractor. He turned over the broken tractor to maintainer 2 (M2) and mentioned there was an issue with the gas pedal, but it was usable. M2 took custody of the tractor and parked it between two aircraft in preparation for towing GSE. Once ready, M2 had difficulty switching gears and the accelerator pedal was now dropped to the floorboard, revving the tractor engine to full throttle. Feeling that the tractor issues were becoming too much (*here's where we wish the report said "he shut the tractor off"...*) he decided to move the tractor back to the hangar. He released the brake pedal and the tractor accelerated forward into the outer wing of an aircraft (*crunch*), causing over \$1 million in damages to both the aircraft and tractor; luckily, there were no injuries to report. —*The beginning of this report showed a process working as it should (spring found, origin identified, squadron notified, GSE deemed inoperable). But then, a series of missteps nullified the benefit gained. Had either maintainer conducted a pre-op inspection correctly, they would have understood why not to use the tractor (besides being told not to use it). Overconfidence in their abilities, coupled with procedural non-compliance and a 'safe-enough' mindset led to this mishap.*

- **Aircraft VS Aircraft.** In the hangar bay, the aircraft move team completed the pre-move checklist and briefing per requirements. As the aircraft under tow was turned right, the left stabilator contacted the stationary aircraft next to it. Ultimately, the wing walker was responsible for ensuring the aircraft were clear of one another or stopping the move. The brief lapse in situational awareness cost over a half million dollars in damages and temporarily took two warfighting assets out of inventory. Recognition of aircraft proximity in the hangar bay and flight deck environment demands attention to detail and vigilance during the entire evolution. —*Each person assigned to this move had an essential role. We can have the most thorough brief and preparation possible, but this is the result if we take our positions and don't execute accordingly. When in doubt, stop the move and reevaluate. You must be attentive to recognize what's unfolding in front of you.*
- **More Dangerous Than You'd Think.** Aircraft tow bars are heavy, many over 100 lbs., and they put forces in play that often go unrecognized. The following few examples involved manually moving tow bars and could have been avoided with good communication, risk management and proper technique:
 - While quickly pushing a tow bar over a catapult to attach to an aircraft, the tow bar caught on the catapult, halting its momentum and impacting the maintainer's groin. Trauma with light duty to follow.
 - While pulling a tow bar backward, the maintainer stumbled, fell backward and dropped the tow bar on his leg. The resulting laceration required several days off work, followed by light duty.
 - While lifting a tow bar to connect to the tractor, the maintainer felt lower back pain. The incorrect lifting technique resulted in lower back trauma, hernia, surgery, days off work and light duty to follow.
 - While unlatching a tow bar from the tractor, the tractor driver moved forward without a signal from the maintainer. The movement caused the maintainer to take on the weight of the tow bar unexpectedly. The tow bar fell to the ground, his fingers still underneath, resulting in a fractured finger and limited duty.

Key Takeaways

1. **You know there's a procedure, follow it.** Don't allow the normalization of deviance to occur. As in our broken tractor example, skipping the requisite tractor inspection by two maintainers suggests a normalization of deviance where procedural non-compliance is accepted. Couple that with faulty risk perception and you quickly remove the built-in safety net that has been painstakingly developed within naval aviation over time.
2. **Be aware.** A "loss of situational awareness" or "breakdown in visual scan" are often reported as causal factors in mishap reports. It happens when people get distracted (or fixate on one thing) and don't complete the required steps or don't adjust to changes as they unfold. Do visual scans with the intent to find the less obvious issues. As the move progresses, clearances between obstacles change, so your perception of reality must update along with it. Focus is good; fixation is bad.
3. **Do it right, not just right now.** Many reports mention the maintainer was in a hurry or there was perceived pressure to expedite. Slow down enough to effectively watch for obstructions and position yourself in the safest way possible when lifting, moving, coupling, disconnecting and setting down tow bars. Injuring someone while focusing more on speed than process or procedure isn't efficient or faster.

And remember, "Let's be careful out there."