5.1 What is the purpose of this chapter? This chapter:

A. Establishes U.S. Fish and Wildlife Service (Service) safety requirements for towing and cargo-carrying vehicles and trailers. A trailer is a rubber-tired vehicle without its own power, so a motor vehicle or motor equipment has to pull or propel it.

B. Provides safety standards, guidelines, and training criteria for transporting cargo, including:

(1) Heavy duty equipment (see 243 FW 1 for definitions),

(2) Light duty equipment,

(3) Off-Road Utility Vehicles (ORUV), and

(4) All other cargo we transport in Service-owned, leased, or rented motor vehicles.

5.2 What are the authorities and responsibilities for this chapter? See 243 FW 1 for a list of authorities and general responsibilities for this and the other chapters in Part 243.

5.3 What are the general requirements for towing and trailers? When towing, you must:

A. Comply with applicable Federal and State Department of Transportation (DOT) regulations (e.g., 49 CFR and Federal Motor Carrier Safety Administration (FMCSA) regulations).

B. Ensure that the towing devices you use on any combination of vehicles are structurally adequate, rated by the manufacturer for the weight drawn, and properly mounted. Towing devices include receivers, hitches, hitch balls, trailer couplers, and tongues. Vehicles used for towing must be equipped with a device(s) that allows the operator to extend the mirrors out for wide loads.

C. Not exceed the towing capacity of any tow vehicle.

D. Not exceed the Gross Combined Weight Rating (GCWR) of a medium or heavy duty truck when used in combination with a trailer. The manufacturer specifies this value as the maximum loaded weight of a combination vehicle.

E. Couple every trailer, except fifth-wheel trailers, to the towing vehicle with safety chains or cables that meet Society of Automotive Engineers International Standard J684. This prevents the vehicle and trailer from separating in case the trailer/hitch disconnects.

(1) Cross safety chains or cables in an “X” pattern below the ball mount with enough slack so that they do not restrict turning, drag the ground, or allow the coupler to hit the ground.

(2) Use properly rated safety chains with clevis hooks that have a functioning safety latch to prevent the hook from disconnecting from the tow vehicle unless you’re using a trailer whose manufacturer provides “S” style chain hooks as Original Equipment Manufacturer (OEM) equipment.

(3) Do not twist the safety chains to shorten their length.

F. Load trailers so that the weight is distributed evenly on all wheels. When properly balanced, approximately 10-15 percent of the total weight should rest on the trailer hitch. For multiple stacked items loaded onto a trailer, the heaviest items should be on the bottom to maintain a low center of gravity and aid in stability.

G. Use electric hookups to activate the tail lights, brake lights, license plate illuminator light, and turn signals. Trailers that are 6½ feet wide or wider at any point, including the load, must have front and rear side marker lights.

H. Ensure trailers comply with State and local requirements for brakes and breakaway components or switches. Local guidelines that impose more restrictive requirements take precedence.

I. Set parking brakes and chock the wheels of the trailer and tow vehicle before loading or unloading equipment from a trailer. There are two exceptions:

(1) You do not need to use wheel chocks on a detachable goose neck trailer if you are loading or unloading it in the detached position with the air lines disconnected and the deck on the ground.

(2) When you are loading or unloading an ORUV, you can decide whether or not to use chocks on the trailer and tow vehicle depending on the situation, but you must set the emergency brake/parking brake on the tow vehicle.

5.4 What emergency and safety equipment is necessary when towing?

A. You must have the following emergency equipment in towing vehicles when you are towing a trailer or another piece of equipment:

(1) A properly rated and sized fire extinguisher,

(2) Warning devices for stopped vehicles (e.g., emergency reflective triangles),

(3) Red flags, and

(4) Other items that 49 CFR 393.95 or State transportation regulations require.

B. Trailers must be equipped with reflective tape, retro reflective sheeting, or reflex reflectors that meet the requirements of 49 CFR 393.13 if they:

(1) Were purchased after December 1, 1993;

(2) Are 80 inches wide or wider; and

(3) Have a Gross Vehicle Weight Rating (GVWR) of 10,001 pounds or more.

C. You may add reflective tape or retro reflective sheeting to other vehicles to improve visibility of a vehicle, trailer, etc. for safety (e.g., to increase the visibility of a fire engine).

5.5 When is a cargo barrier required? Cargo-carrying trucks and vans must be equipped with a cargo barrier or similar device that is strong enough to prevent load shifting and penetration or crushing of the driver's compartment (see 49 CFR 393.114 for width, height, and construction standards). The structure must be located between the vehicle's cargo and the vehicle's operator and passenger compartment. You must maintain the cargo barrier so that it continues to meet these standards. This requirement applies to sedans, station wagons, and sport utility vehicles that, as part of their operation, transport cargo in the passenger compartment. See 243 FW 2 for cargo barrier requirements for special purpose trucks (e.g., fish distribution trucks).

5.6 What types of vehicles and trailers do not need a cargo barrier?

A. The following vehicles do not have to have a cargo barrier, but must comply with section 5.7:

(1) Vehicles (e.g., car carrier/transport) designed and used exclusively to transport other motor vehicles, if each vehicle transported is secured with suitable and adequate tiedown devices; and

(2) Pickup trucks carrying loads that do not extend above the bed wall, since the bed walls are manufactured to meet the minimum requirements of 49 CFR 393.114. If the load extends above the bed wall height and the bed wall will not contain or keep the load from striking the vehicle's cab during a sudden or emergency stop, you must install a cargo barrier or front-end structure meeting the requirements of 49 CFR 393.114.

B. The following trailers do not have to have a cargo barrier:

(1) Pole trailers or semi-trailers that a tractor tows. (The tractor must be equipped with a cargo barrier that conforms to section 5.6A).

(2) Full trailers towed by vehicles equipped with a cargo barrier that conforms to the requirements in section 5.6A.

5.7 What is the policy for securing cargo loads? You must tie down and secure cargo loads in a safe manner in compliance with 49 CFR 392 and 393 and this chapter (see sections 5.8 – 5.12). Give particular attention to loads of round or rolled materials and to any hazardous items.

5.8 What are the requirements for securing loads?

A. Determine the size of the chain to use by the weight of the equipment that you are transporting and the Working Load Limit (WLL) of the chain and other tiedown components. The size/grade/strength of all tiedown components must, at a minimum, meet the requirements in section 5.8B and 49 CFR 393. WLL is the maximum safe load that may be applied to a component of a cargo securement system during normal service.

B. The Aggregate WLL (AWLL) is the sum of the WLLs of all the tiedowns of any securement system and must be equal to or greater than 50% of the weight of the cargo. You may add

tiedown WLLs together to determine the AWLL. The formula for determining the AWLL depends on the method of the tiedown system you use (see 49 CFR 393.106(d)). If a State DOT program requires an aggregate WLL that is greater than Service requirements, you must follow the State requirement.

(1) Use 50% of the WLL of each tiedown assembly to calculate the AWLL if the tiedown goes from an anchor point on the transport vehicle to an attachment point on the cargo, or if it attaches to the transport vehicle, goes over, through, or around the cargo and attaches to the **same** side of the transport vehicle.

(2) Use 100% of the WLL of each tiedown assembly to calculate the AWLL if the tiedown goes from one side of the transport vehicle, over, through, or around the cargo and attaches to the **opposite** side of the transport vehicle.

C. Attach and secure each tiedown.

D. Use a minimum of four separate tiedowns for heavy and light duty equipment and additional tiedowns for attachments/implements as required in 49 CFR 393.110 and 393.130 (also see section 5.10).

E. Place tiedowns so that the equipment/cargo does not move forward, backward, or from side to side. DOT requires a tiedown assembly every 10 feet (3 meters) of the equipment/cargo length.

F. When using a trailer equipped with rub rails, you must locate all tiedowns and other components of the cargo securement system inside of the rub rails whenever practicable.

G. Use chain assemblies for tiedowns in accordance with 49 CFR 393.100-136.

H. Do not use cold shuts (i.e., devices to join links of a chain) to extend the working length of a chain or as a component of any tiedown assembly. You may only add devices that are approved by the chain manufacturer and that maintain the integrity and rating of the tiedown assembly.

I. When you use tiedown chains, you may only use ratchet load binders. You may not use lever type load binders.

J. Use edge protection where chains or straps contact equipment edges and those edges may damage securement devices (i.e., cause abrasion or cutting).

K. Use securable blocking and bracing in conjunction with tiedown components for equipment that does not have a functional parking brake system. Securable chocks must have chains or straps that attach to the loaded equipment or trailer so that they will not become easily displaced or fall off the trailer during transport.

L. Use chocks, wedges, cradles, or other similar items to restrain equipment that is likely to roll. See 49 CFR 393.116-136 for requirements specific to such commodities as logs, building

products, metal coils, concrete pipes, etc. Ensure that chocks will not unfasten or become loose while the vehicle is in transit.

M. If you use synthetic webbing/straps to secure a load, they must conform to the Web Sling and Tiedown Association's Recommended Standard Specification for Synthetic Web Tiedowns, WSTDA-T-1. They must also have a ratchet locking device.

5.9 What other guidance on securing loads should employees follow?

A. To supplement the guidance in section 5.8, use:

(1) The Federal Motor Carrier Safety Regulations (49 CFR 390-399),

(2) Our *Heavy Equipment and ORUV Safety Training Handbook* (available online and from your Regional Heavy Equipment Coordinator), and

(3) The manufacturer's equipment operation manual.

B. You must:

(1) Be aware of all applicable State DOT regulations, and

(2) Follow the applicable State regulations and local guidelines that are more restrictive than the requirements of this chapter.

5.10 What is the standard for tiedown assemblies for heavy and light duty motor equipment? You must use at least four tiedown assemblies and ensure that you have properly graded and rated tiedown components for your loads. There are many grades, sizes, and strengths of tiedown components available on the market. The component specifications in Table 5-1 are the **minimum** standards for all tiedown assemblies. The load you transport may require higher grade/rate/strength components.

Table 5-1: Minimum Tiedown Assembly Standards for Heavy and Light Duty Equipment

General Standards	For Heavy Duty Equipment (>10,001 pounds)	For Light Duty Equipment (≤10,000 pounds)
A. Minimum number of tiedowns	4	4
B. Grade		
Chain	Grade 7 transport with grade identification markings of "7," "70," or "700"	Grade 7 transport with grade identification markings of "7," "70," or "700"
Synthetic Webbing	Not Allowed	Rated to meet AWLL
C. Minimum Size		
Chain	3/8 inch (.9375 cm) with a WLL of 6,600 pounds.	Must meet the AWLL formula.
Synthetic Webbing	Not Allowed	Must meet the AWLL formula.

Table 5-1: Minimum Tiedown Assembly Standards for Heavy and Light Duty Equipment		
General Standards	**For Heavy Duty Equipment (>10,001 pounds)**	**For Light Duty Equipment (≤10,000 pounds)**
D. Hook grade/strength/design		
Chain	Must have the same as or greater WLL as the chain being used and a clevis-type grab hook design (see section 5.3E).	Must meet or exceed the AWLL formula (see section 5.8B).
Synthetic Webbing	Does Not Apply	Must meet the WLL of the rating for the webbing.
E. Ratchet load binder		
Chain	Must at least have the same WLL as the chain being used.	Must at least have the same WLL as the chain being used.
Synthetic Webbing	Does Not Apply	Must meet the WLL of the rating for the webbing.

5.11 What are the requirements for snowmobile tiedown systems? You must choose from one of three securement systems to secure a snowmobile to a trailer. See Table 5-2.

Table 5-2: Three Alternatives for Tying Down Snowmobiles	
This alternative…	**Employs…**
A. Front and rear fastening devices	**(1)** A snowmobile tiedown bar or fastening device for the front skis that is designed specifically for this purpose and rated for the total weight of the snowmobile. **(2)** A fastening device to secure the rear sled, such as a clamp, that is designed specifically for this purpose and rated for the total weight of the snowmobile. **(3)** Fastening devices designed, installed, and maintained to ensure the performance criteria for breaking strength and working load limits outlined in 49 CFR 393.102 and following the provisions in this chapter.
B. Front fastening device with rear synthetic ratchet straps	**(1)** A snowmobile tiedown bar or fastening device for the front skis that is designed specifically for this purpose and rated for the total weight of the snowmobile. **(2)** A fastening device that is designed, installed, and maintained to ensure the performance criteria for breaking strength and working load limits outlined in 49 CFR 393.102.

Table 5-2: Three Alternatives for Tying Down Snowmobiles	
This alternative…	**Employs…**
	(3) Two synthetic ratchet straps that secure the rear sled and that comply with the provisions in this chapter.
C. Front and rear securement with synthetic ratchet straps	Four individual synthetic ratchet straps (two in the front and two in the rear) that comply with the provisions in this chapter.

5.12 May employees use tiedown chains for other purposes? No. Do not use chains designed for tiedowns for any other tasks (e.g., lifting pipes, pulling stumps, etc.). If you use rated or designated transport chains for other work purposes, they may get hidden or hard-to-detect damage that could adversely affect the chain's WLL. If you use tiedown chains for some other task, you may no longer use them for securing loads.

5.13 What should employees do before they begin transporting a load?

A. Lower and secure to the vehicle all accessory equipment, such as hydraulic shovels.

B. Restrain articulated vehicles with manufacturer-designed locking devices.

C. Restrain equipment or machinery that has crawler tracks or wheels with each tiedown affixed, as practicable, to the front, side, and rear of the equipment or its securement points so that it does not move up and down, from side to side, forward, or backward.

D. Before each use, visually inspect (or ask another employee to inspect) all components (chains, straps, hooks, securable chocks and blocks, and ratchet load binders) of the tiedown assemblies you currently use for transporting heavy and light duty equipment.

(1) Check for:

(a) Broken or cracked links;

(b) Nicks;

(c) Gouges;

(d) Abrasions;

(e) Wear knots; and

(f) Twisted, bent, or stretched links/sections.

(2) Ensure that chain securement points (D-rings, etc.) on the trailer or truck meet the WLL requirements.

(3) Also check critical areas of a chain—the portions typically used at the trailer's tiedown points—because that is where the chain is most stressed when the hook is fastened into it.

E. Inspect the overall height and width of the transport vehicle to ensure it complies with size restrictions for the State(s) in which you travel. If the transport vehicle is over-sized or over-weight, you must obtain a hauling permit for the State(s) in which the vehicle is, or will be used.

5.14 What are the requirements for drivers to inspect their loads during transport? Drivers must:

A. Inspect the loaded equipment and the load securement devices within the first 5 miles after beginning a trip. If there is any movement, you must make adjustments to the equipment or securement devices, including adding more devices to ensure the equipment cannot shift on, within, or fall from the transport vehicle.

B. Re-inspect the load every 3 hours or 150 miles, whichever comes first.

C. Re-inspect the load during or after traveling extremely rough roadway or after an emergency braking or steering situation.

D. Adjust the equipment and securement devices to ensure the load is secure.

5.15 Is there an inspection program for tiedown assemblies? Yes. Project Leaders, supervisors, and facility managers responsible for activities that involve transporting loads must:

A. Establish a semiannual tiedown assembly inspection program to inspect assemblies for:

(1) Size,

(2) WLL, and

(3) Condition.

B. Maintain files for the inspections that include at least the following information:

(1) Date of inspection,

(2) Condition of specific components, and

(3) Who did the inspection (including inspector's signature).

C. Remove from service and destroy any tiedown component that shows signs of wear that could diminish the WLL. Station files should contain an up-to-date disposition status log of "removed from service" or "destroyed" components.

5.16 Is there mandatory training on securing loads for transport? Yes. Project Leaders, supervisors, and facility managers must ensure that all employees involved with securing loads receive training that includes:

A. Determining:

(1) The size and number of the chains or tiedown components to use,

(2) The AWLL of the tiedown assemblies, and

(3) The size/grade/strength of all tiedown components (see section 5.8);

B. Placement of chain assemblies or tiedown assemblies in accordance with DOT or manufacturers' standards;

C. The requirements in 243 FW 1-6 and 321 FW 1 that apply to transportation of equipment and cargo; and

D. Information about securing heavy and light duty equipment that describes how only trained and authorized operators may load or unload equipment onto or from a transport vehicle.

5.17 How do employees get the mandatory training for securing loads? Contact your Regional Heavy Equipment Coordinator to obtain a list of courses available for the type of equipment or cargo you need to secure. See 243 FW 6 for additional requirements for transporting ORUVs.

/sgd/ Martin Kodis
ACTING DIRECTOR

Date: February 10, 2016