

# TECH 00061

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HUMAN EXTERNAL CARGO – GROUND TO STRUCTURE

# GETTING STARTED

1



Emergency Room Safety

**Know your role  
&  
responsibilities.**

2



Get Acquainted

**Meet your  
instructor &  
classmates.**

3



Ground Rules

**Prepare yourself for  
a successful  
learning experience.**

# WHY YOU ARE TAKING THIS COURSE

The Company uses helicopters to perform a wide variety of tasks, and each of the jobs that involve **human external cargo (HEC)** operations are inherently dangerous and could be fatal.

This course provides information and training that could save your life and your co-workers lives, including:

- ✓ Training and safety requirements.
- ✓ Tailboard requirements.
- ✓ Mandatory requirements, processes, and procedures.



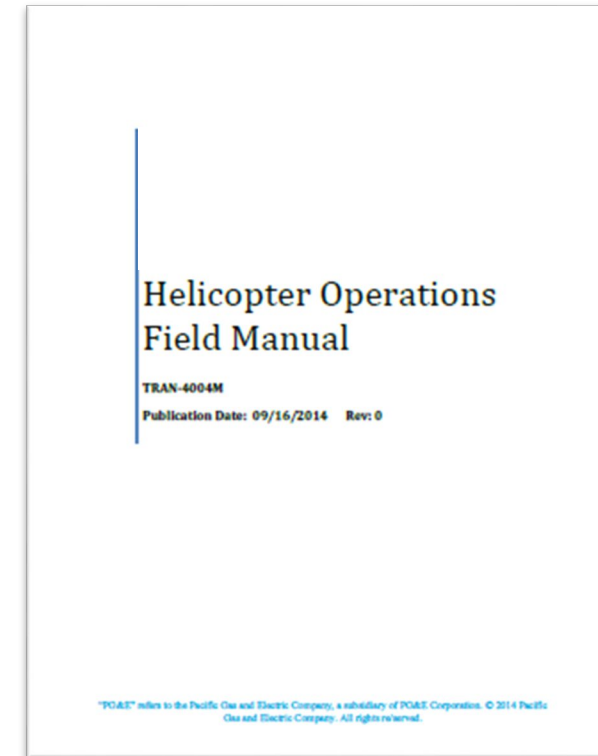
# COURSE OVERVIEW

## COURSE DESCRIPTION

This course is designed to provide you with basic information about the techniques used to perform human external cargo (HEC) operations.



You are expected to review and familiarize yourself with the [Helicopter Operations Manual](#) and include it in your tailboard briefings prior to utilizing HEC operations in the field.



# MISSION, VISION, CULTURE

## Our Mission

To safely and reliably deliver affordable and clean energy to our customers and communities every single day, while building the energy network of tomorrow.

## Our Vision

With a sustainable energy future as our North Star, we will meet the challenge of climate change while providing affordable energy for all customers.

## Our Culture

We put safety first.

We are accountable. We act with integrity, transparency and humility.

We are here to serve our customers.

We embrace change, innovation and continuous improvement.

We value diversity and inclusion. We speak up, listen up and follow up.

We succeed through collaboration and partnership. We are one team.

# KEYS TO LIFE

To assure your safety and that of your co-workers and the public:

- 🔑 Follow safe driving principles.
- 🔑 Use appropriate life-saving personal protective equipment (PPE)
- 🔑 Follow electrical safety testing and grounding rules.
- 🔑 Follow clearance and energy lock-out rules.
- 🔑 Follow confined space rules.
- 🔑 Follow suspended load rules.
- 🔑 Follow safety at heights rules.
- 🔑 Follow excavation procedures.
- 🔑 Follow hazardous environment procedures.



# WHAT YOU WILL LEARN TO DO

When you complete this course, you will be able to:

- Describe training requirements for performing HEC tasks.
- Demonstrate the procedures to request a helicopter.
- Determine operating conditions and landing zones for HEC operations.
- Demonstrate the procedure to conduct a helicopter tailboard for HEC crews prior to the start of work.
- Demonstrate and comply with proper use of HEC equipment during transfers.
- Demonstrate and comply with Human External Cargo pre-flight safety inspections and procedures.
- Demonstrate proper takeoff procedures for HEC procedures for ground to ground, ground to steel, and ground to wood pole transfers.






# REFERENCES

The following documents are referenced in this training:

- Code of Safe Practices.
- TRAN-4004M, Helicopter Operations Field Manual.
- TRAN-FM-010, Temporary LZ Form.
- TRAN-4004B-002, HEC Rescue Knives.
- SAFE-1005S, Personal Protective Equipment Standard.
- Human Performance Error Prevention Tools



# TESTING YOUR KNOWLEDGE & SKILLS

Type		Function	Format	Occurrence	Graded
<b>Knowledge Check</b>		Check your understanding of the course material.	Informal quiz, activity, or discussion	Located in each course module.	No
<b>Knowledge Assessment</b>		Demonstrate your comprehension of information related to the course objectives	Formal open-book, ___ question, multiple choice test.	Administered at the end of the course.	Yes*  Pass Criteria: Score of 90%
<b>Skill Assessment</b>		Check your ability to perform tasks related to the course objectives	Qualification form used by instructor to observe operating performance.	Administered at the end of the course.	Yes*  Pass Criteria: Score of 100%

\* You must pass the **knowledge assessment** and **skill assessment** to receive course credit.

# HUMAN PERFORMANCE TOOLS

Human Performance error prevention tools provide effective techniques to reduce human error.



- People aren't sure what to do on the site.



- People do the same thing over and over.
- STAR – Stop, Think, Act, and Review



- People are in a hurry.
- Not stopping when unsure.



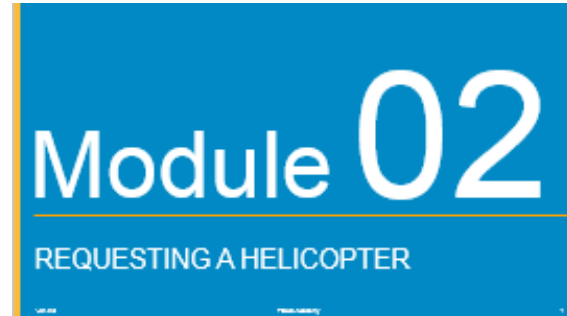
- People misinterpret communication.

# COURSE STRUCTURE



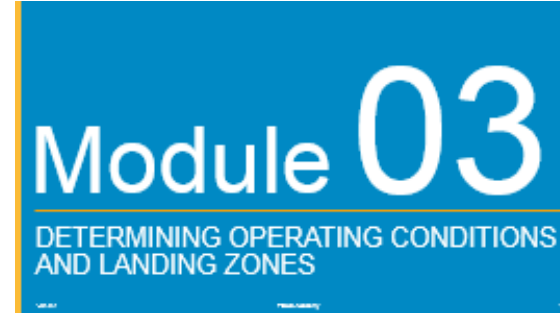
## MODULE 1

Human External Cargo Training Requirements



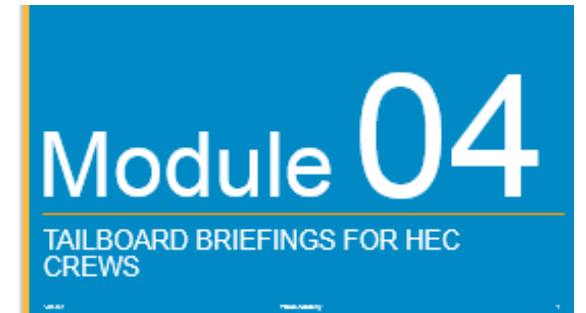
## MODULE 2

Requesting a Helicopter



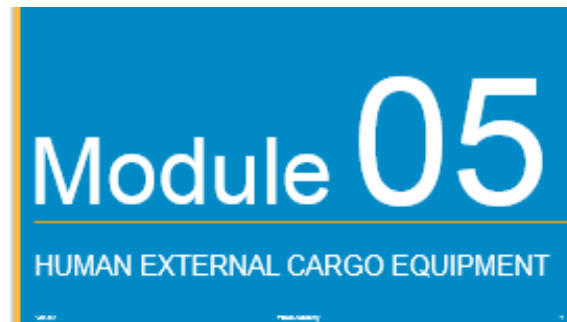
## MODULE 3

Determining Operating Conditions and Landing Zones



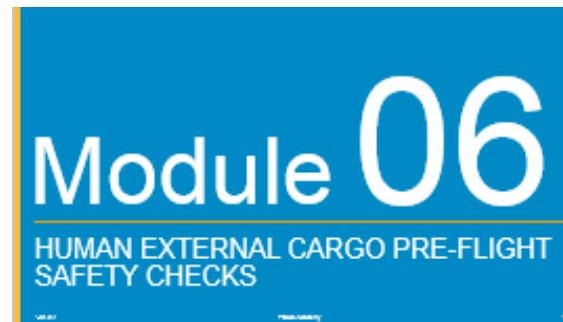
## MODULE 4

Tailboard Briefing for HEC Crews



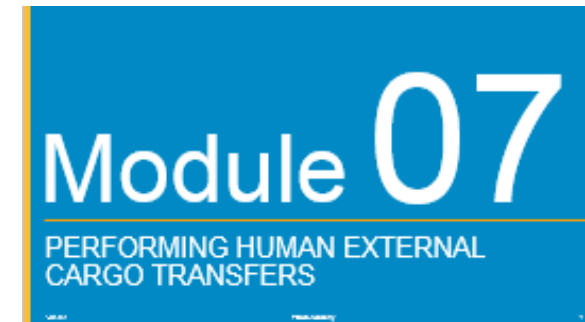
## MODULE 5

Human External Cargo Equipment



## MODULE 6

Human External Cargo Pre-Flight Safety Checks



## MODULE 7

Performing Human External Cargo Transfers



# Module 01

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## HUMAN EXTERNAL CARGO TRAINING REQUIREMENTS



# HUMAN EXTERNAL CARGO TRAINING REQUIREMENTS

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# TRAINING REGULATIONS

When performing work that involves a helicopter:



HEC employees must use the procedures contained in this training.



HEC employees must use the Helicopter Operations Field Manual.



All Pacific Gas and Electric Company work procedures are written to be in compliance with the **Federal Aviation Administration (FAA)** regulations contained in Federal Aviation Regulation (FAR) 14 CFR, Part 133, Class B, external loads.



# PART 133

## FAA REGULATIONS

### Section 133.35, Carriage of Persons:

- (a) No certificate holder may allow a person to be carried during rotorcraft external-load operations unless that person:
  - 1) Is a flight crewmember;
  - 2) Is a flight crewmember trainee;
  - 3) Performs an essential function in connection with the external-load operation; or
  - 4) Is necessary to accomplish the work activity directly associated with that operation.
  
- (b) The pilot in command shall ensure that all persons are briefed before takeoff on all pertinent procedures to be followed (including normal, abnormal, and emergency procedures) and equipment to be used during the external load operation.



# FAA HEC EXEMPTION

**HEC work will only be allowed through exemption process only per FAA.**

**Exemption requirements include:**

- Show proof of training.
- Documentation that training has occurred.
- No regulation outlining what the training has to consist of or length of training, nor who training was conducted by.
- Pilots are not trainers. All contractors should have their own training program.

**Company must approve HEC training program:**

- This is to protect employees and protect the work procedures (HEC).

# SELECTION OF HEC WORKERS



## VOLUNTEER EMPLOYEES ONLY

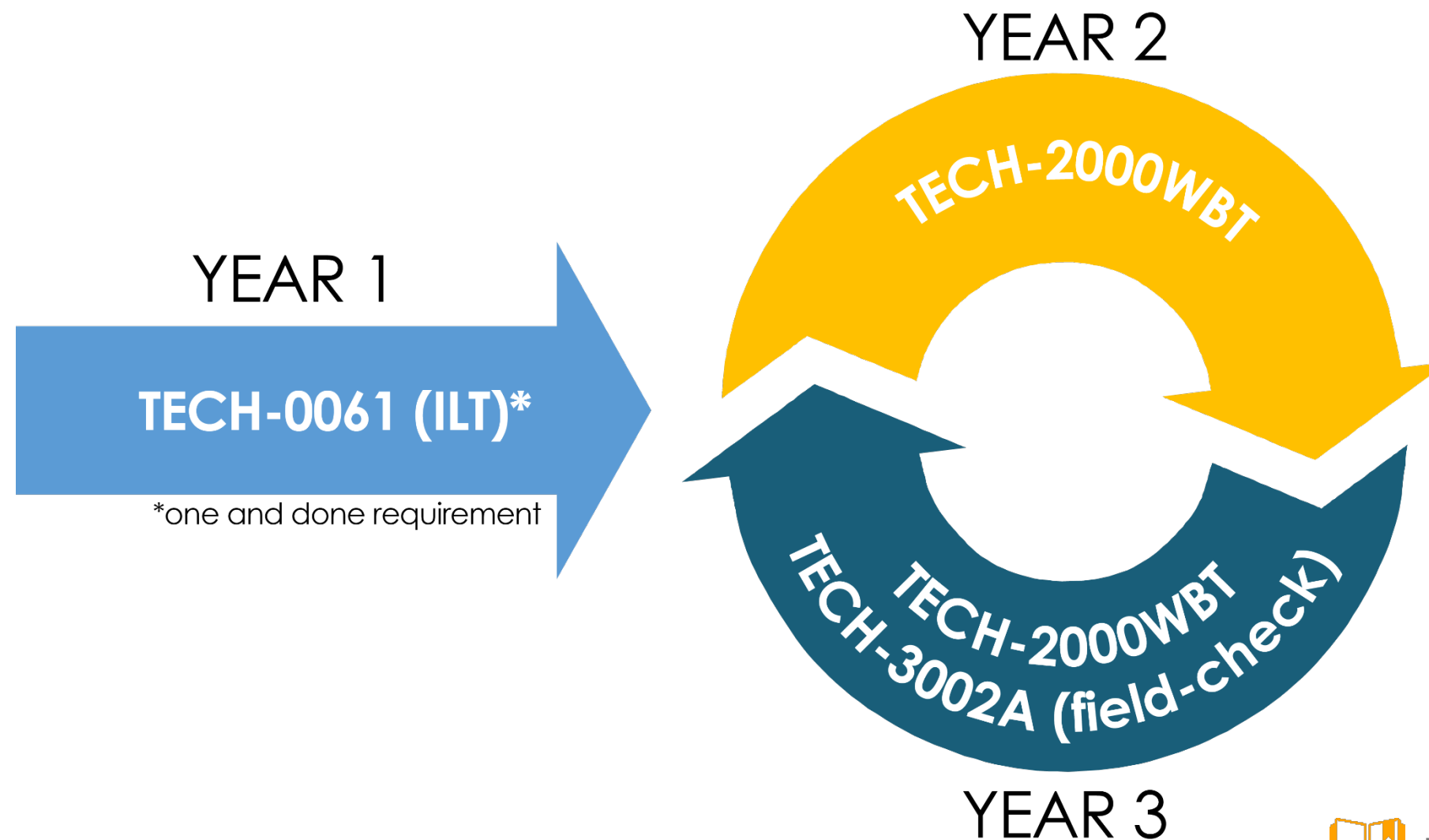
- Employees will never be forced or required to perform or undertake helicopter HEC activities.
- No action will be taken if an employee fails or refuses to volunteer.

## IF NUMBER OF VOLUNTEERS FOR HEC WORK EXCEEDS THE NUMBER OF EMPLOYEES NEEDED:

- The most senior volunteer is selected first, and then the second most senior volunteer, until the project requirements are filled.

# EMPLOYEE TRAINING

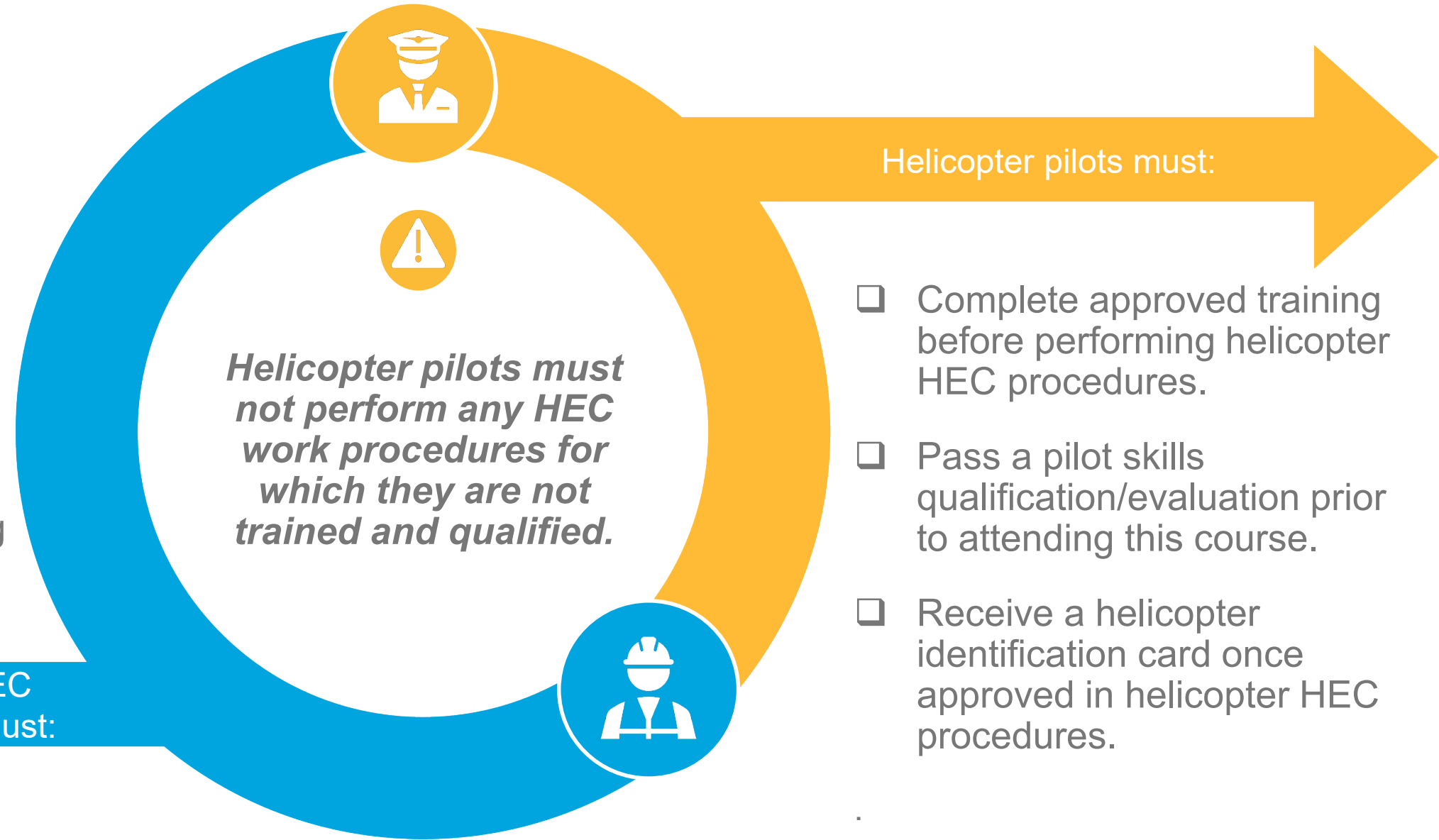
Before performing any work procedures covered in the Helicopter Operations Field Manual, employee must complete the following required trainings to Company standards:



# TRAINING REQUIREMENTS

- ❑ Be trained and qualified by attending the Helicopter Committee-approved helicopter work procedure-training course.
- ❑ The training must include a review of the appropriate sections of TRAN-4004M., Helicopter Operations Field Manual, related to the method(s) that employees are assigned to perform.
- ❑ Be in possession of a helicopter identification card before performing helicopter line work.

All employees assigned to HEC helicopter work procedures must:



Helicopter pilots must:

- ❑ Complete approved training before performing helicopter HEC procedures.
- ❑ Pass a pilot skills qualification/evaluation prior to attending this course.
- ❑ Receive a helicopter identification card once approved in helicopter HEC procedures.

# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

**1** How often are qualified workers required to attend the Human External Cargo refresher training?

- a) Every 6 months
- b) Every 2 years
- c) Every year
- d) No refresher is required

**2** When are pilots qualified to perform HEC work for the Company?

- a) When they complete 100 air patrols.
- b) When they have piloted the setting of a minimum of 25 wood poles.
- c) When they show up with a valid pilot's license.
- d) When they pass an approved qualification exam.

**3** Helicopter HEC work must be performed by \_\_\_\_\_.

- a) Qualified Lineman/Towerman
- b) IBEW contract employees
- c) Volunteer employees only

# KEY TAKEAWAYS

You should now be able to:

- Describe FAA Regulations.
- Explain how HEC workers are selected.
- Explain the helicopter training requirements for the employee, helicopter pilots, and HEC workers performing helicopter HEC tasks.





# Module 02

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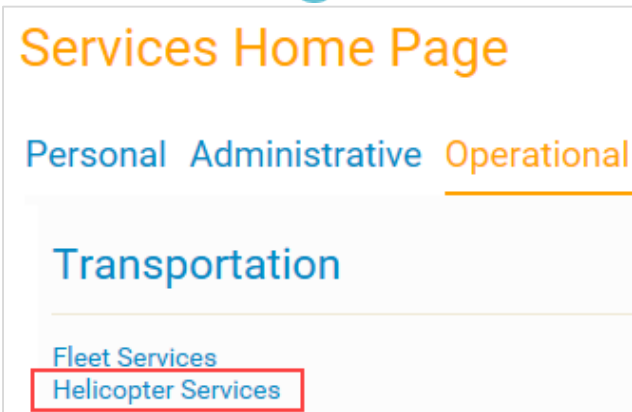
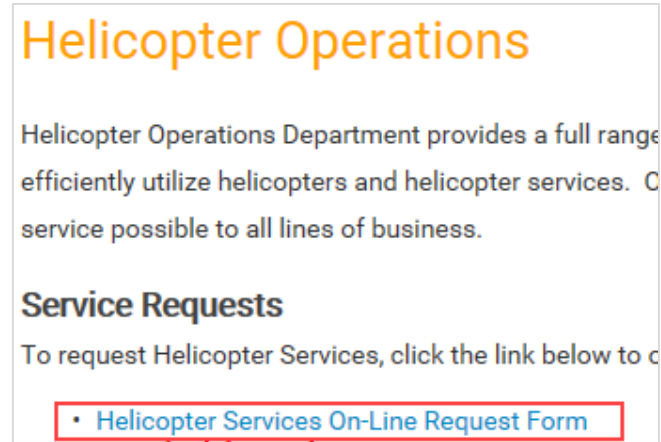
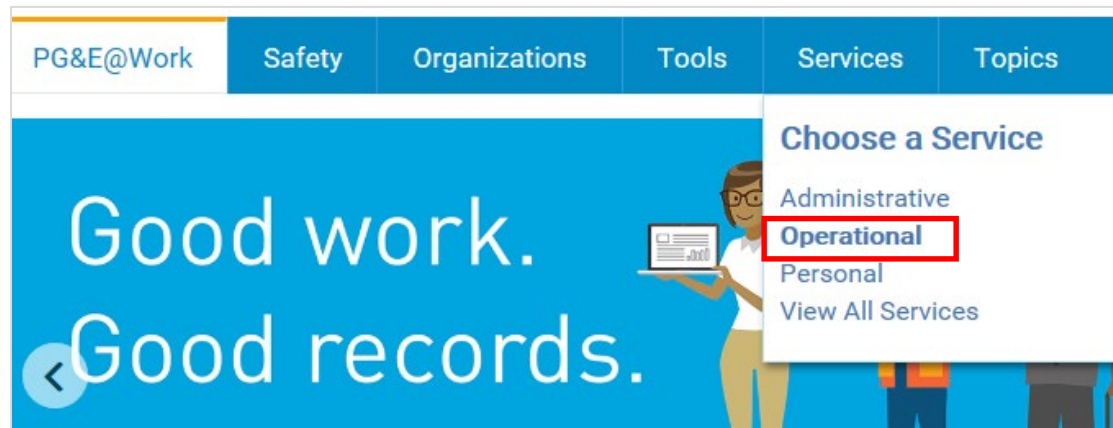
## REQUESTING A HELICOPTER



## REQUESTING A HELICOPTER

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# STEPS TO REQUEST A HELICOPTER



Fields marked with an asterisk (\*) are required

REQUESTOR INFORMATION	
Request Date:	5/9/2019
LAN ID:	<input type="text"/> ? *
Name:	<input type="text"/> ? *
Phone:	<input type="text"/> ? *
Cell:	<input type="text"/> ? *
Line of Business:	<input type="text"/> ? *

# FILLING OUT THE REQUEST FORM

Fields marked with an asterisk (\*) are required

## REQUESTOR INFORMATION

Request Date:	5/9/2019	
LAN ID:	<input type="text" value="JU3S"/>	?
Name:	<input type="text" value="Jennifer Ro"/>	?
Phone:	<input type="text" value="(510) 566-4033"/>	?
Cell:	<input type="text" value="(510) 566-4033"/>	?
Line of Business:	<input type="text" value="Academy Operations"/>	?

## WORK INFORMATION

Work Type:	<input type="text" value="Lift Work"/>	?
Lift Work Type:	<input type="text" value="HEC - Non-Energized"/>	?
Is this emergency work?	<input type="text" value="No"/>	?
Is this work for a 3 <sup>rd</sup> party contractor?	<input type="text" value="No"/>	?

Please provide a detailed scope of work, reason for aircraft usage, work procedures to be performed, and all external cargo.

Provide detailed scope of work in this box. ?



## Required Information on Online Form:

### Requester Information:

- LAN ID
- Phone/Cell
- Line of Business

### Work Information:

- Work Type
- Type of cargo
- Is this emergency work?
- Is this work for a 3<sup>rd</sup> party contractor?
- Detailed scope of work



# FILLING OUT THE REQUEST FORM (CONT.)

## AIRCRAFT INFORMATION

Aircraft Type:  ?

This aircraft will work on the following dates:

« May » « 2019 » ?						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	29	30	1	2	3	
	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8
None						

Please provide us more information about where this aircraft will be going on **Monday, May 27, 2019**

Please use the buttons below to add locations to your flight plan for the day. Once you have added locations, you can click and drag to change their order. ?

Time	Name Lat/Lon



## Required Information on Online-Form:

### Aircraft Information:

- Size and type of helicopter suitable for known conditions
- Dates the aircraft will work
- Specify another aircraft if needed



## Helicopter Operations Manual, Appendix 3 - Selecting an Aircraft

- The tables provide guidelines for selecting a helicopter based on load capacity and operator



# FILLING OUT THE REQUEST FORM (CONT.)



Time	Name Lat/Lon
09:00	6IA5 - DAVIS FIELD 42°37.00'N 92°13.01'W
	10350 WEST SACRAMENTO-DAVIS 39°4.80'N 84°12.60'W

Add LZ

Add Work Location

Edit Selection

Delete Selection

How many hours will the aircraft be used?  ?

Please enter the billing number(s) you'd like to charge for this day

Billing Number:  ?

Add Another Billing Number

Please select any required notifications from the list:

Is this request flying over a large body of water or river for an extended period of time?  ?

Will there be any hazardous cargo?  ?

What is the expected total cargo weight?  ?

Will you require a fuel truck?  ?

Please select any special equipment you will require:

HEC Gear

 ?
   

If you have any additional comments, please enter them here:

Enter additional comments here.

## Required Information on Online-Form:

### Aircraft Information:

- Pick-up location (Latitude, Longitude, Arrival Time)
- Work location (Latitude, Longitude, Elevation)
- Length of time the helicopter is needed
- Billing number to charge to
- Any required notifications
- Special circumstances – flying over body of water or hazardous cargo
- Weight of cargo
- Special equipment needed
- Additional Comments
  - Name/approximate weight of each passenger
  - Estimate of the highest ambient temperature
  - Landing zones: GPS coordinates, other landmarks that provide pilot with reference point for locating the work site

# FILLING OUT THE REQUEST FORM (CONT.)



## APPROVER INFORMATION (SUPERINTENDENT)

LAN ID:  ?

Name:  ?

Email:  ?

Cell:  ?

## FOREMAN

LAN ID:  ?

Name:  ?

Phone:  ?

Cell:  ?

## OPTIONAL CC RECIPIENTS

LAN ID:   ?

## Required Information on Online-Form:

### Approver Information:

- LAN ID
- Email
- Cell

### Forman:

- LAN ID
- Phone/Cell

### Optional CC Recipients:

- LAN ID



# FILLING OUT THE REQUEST FORM (CONT.)



## RADIO INFORMATION

Talk About #:  ? **X** Talk About #: Missing

Talk Group:  ? **X** Talk Group: Missing

Talk Radio #:  ? **X** Talk Radio #: Missing

## VALIDATION ERRORS

- X** Talk Group: Missing
- X** Talk About #: Missing
- X** Talk Radio #: Missing

If you have any questions, please do not hesitate to contact the department directly at (707) 449-5832 or email us at [helicopteroperations@pge.com](mailto:helicopteroperations@pge.com).

Submit

Version 5.7.16.21

## Required Information on Online-Form:

### Approver Information:

- LAN ID
- Email
- Cell

### Forman:

- LAN ID
- Phone/Cell

### Optional CC Recipients:

- LAN ID

### Radio Information:

- Talk About #
- Talk Group
- Talk Radio #



# HELICOPTER LOAD CAPACITIES



## Helicopter Operations Manual, Appendix 3 - Selecting an Aircraft

The tables provide guidelines for selecting a helicopter based on load capacity and operators

Type	Model	Interior Capacity (Pounds or Passengers)	External Load Capacity	Operator	Profile (not to scale)
<b>Hughes / MD</b>					
3	500D, E	600	900	1, 2, 11	
3	MD-520 Notar			1	
3	MD-530F			1, 11	
<b>Bell</b>					
2	204 (UH-1B)	Not Allowed	3,100	2, 4	
5	304 (UH-1B)	Not Allowed	3,100	4, 5	
<b>Bell</b>					
3	MD-230E			1, 11	



# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

**1** Which department handles all requests for helicopters?

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- a) Fleet Services Operations
- b) Helicopter Operations
- c) Transportation Operations

**2** Whose responsibility is it to request a helicopter?

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- a) The employee
- b) Helicopter contractor
- c) HEC volunteer

**3** Who determines the correct type of helicopter to use for a specific HEC job?

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- a) Helicopter Operations
- b) HEC Superintendent
- c) HEC pilot

# KEY TAKEAWAY

You should now be able to:

Explain and demonstrate how to request a helicopter using the online-request form.





# Module 03

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DETERMINING OPERATING CONDITIONS  
AND LANDING ZONES



# DETERMINING OPERATING CONDITIONS AND LANDING ZONES

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# EVALUATING OPERATING CONDITIONS

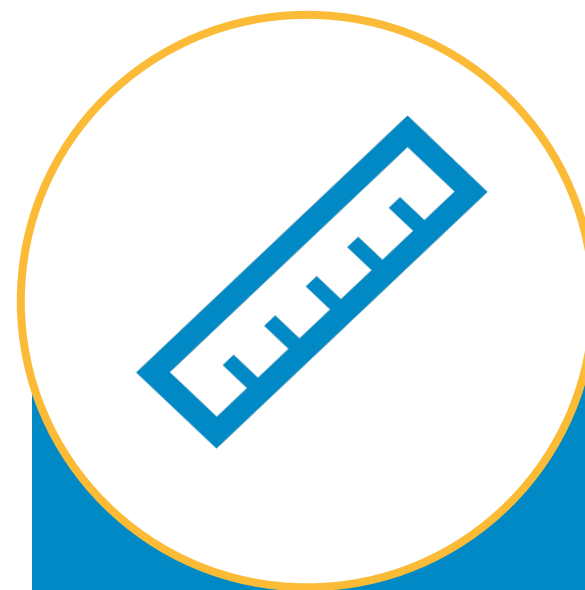
Before each flight, the employee in charge (EIC), pilot, and helicopter line worker(s) must:



Analyze and address any conditions specific to the job.



Agree on safety measures to address job conditions.



Ensure safe distances between the helicopter and any conductors, coworkers, and/or steel structures.



If, at any time either before performing the work or while performing the work, the employee(s), or the pilot, believes that dangerous or unsafe conditions exist that could jeopardize the safety of the operation or warrant aborting of the operation, they have the right to postpone or stop the operation until those safety concerns have been addressed.

# DANGEROUS OR UNSAFE CONDITIONS



## Dangerous or unsafe conditions can include:

- Inclement weather conditions.
- Sustained high winds or gusts.
- Insufficient clearances.
- Exceeding helicopter load limitations.
- Structure or conductor damage that causes safety concerns.
- Any other condition that would adversely affect the safety of the operation.



Use a questioning attitude to foster situational awareness, identify assumptions, and verify facts.

# SELECTING A LANDING ZONE

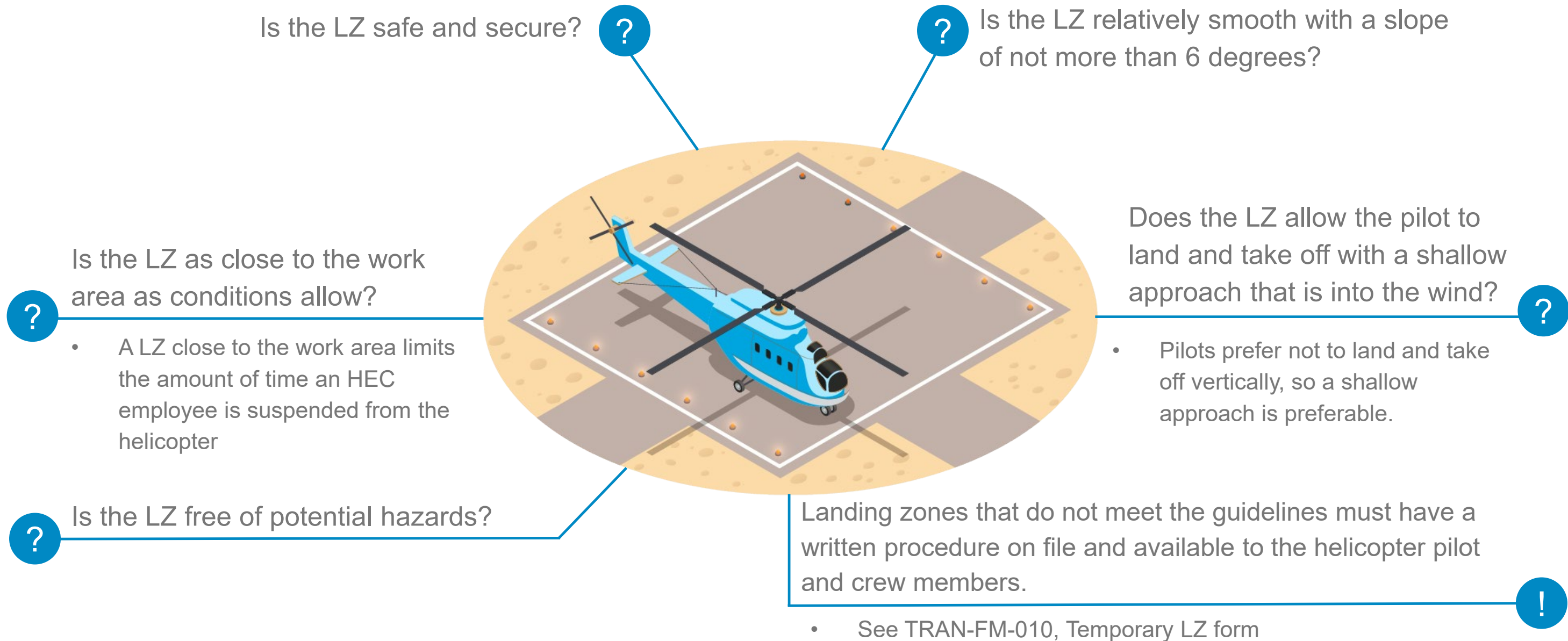


Before the start of an HEC job, an employee must select a landing zone:

- Do not assume that any suitable piece of property can be used for an LZ over an extended period of time
  - Discuss the selection of the LZ as part of advanced planning.
  - Address any site approval issues as part of advanced planning.
  - If the LZ is on non-company property, contact the Land Department and Environmental to secure land use permits or waivers.



# SELECTING A LANDING ZONE (CONT.)



# LZ PREPARATION CHECKLIST



## APPENDIX 2, LANDING ZONE SAFETY CHECKLIST Page 1 of 1

Photocopy this form and take it with you to help select a landing zone (LZ).

**The PG&E employee *selects* the landing zone. (LZ must meet requirements in Chapter 7: Selecting a Landing Zone.) The pilot or pilot's representative *approves* the landing zone.**

Look around the prospective landing zone and note the following items. Check off each item as you note it.

- |  |   |
|--|---|
| <input type="checkbox"/> Trees   | <input type="checkbox"/> Fences                   |
| <input type="checkbox"/> Equipment   | <input type="checkbox"/> Power lines              |
| <input type="checkbox"/> Wind direction  | <input type="checkbox"/> Position of site workers |
| <input type="checkbox"/> 200-foot diameter landing area is clear of any loose objects that could fly up or into the helicopter rotor blades during takeoff or landing. |   |

Answer the following questions. Check off each question as you answer it.

- Does the selected landing zone permit takeoff and landing into prevailing winds?
- Is the selected landing zone relatively level? Is it possible to use hilltops and ridges?
- If using a built-up landing zone, is it capable of supporting the helicopter on the landing surface and providing good footing?
- If using a prepared landing zone on a hillside, will the largest rotor clear the hillside by a distance equal to the rotor's horizontal radius?
- No objects, such as rocks, stumps, and similar objects in a landing zone may protrude higher than 5 feet above the ground line to either side or in front of the helicopter. No objects in the LZ behind the rear doors of the helicopter may protrude higher than 2 feet above the ground line.
- Have safe and effective means been implemented to control dust at the helicopter's selected landing zone? If necessary, it may be helpful to water the landing zone before the helicopter's arrival or departure.

Helicopter Operations Manual,  
Appendix 2 - Job Aid: AVI-3001M-  
JA03, LZ Preparation Checklist

Refer to the LZ Preparation Checklist for additional landing zone conditions that must be addressed prior to take off.

# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

**1** Before each flight, the employee in charge (EIC), pilot and helicopter line worker(s) must:

- a) Analyze and address any conditions specific to the job.
- b) Agree on the type of helicopter to use.
- c) Makes sure there is a wind indicator at the landing zone.

**2** Who has the right to postpone or stop an operation until all safety concerns have been addressed?

- a) Pilot
- b) HEC volunteer
- c) Anyone

**3** What document is used to ensure all potentially dangerous or hazardous conditions are addressed, and that the LZ is within the requirements of the helicopter's ability to land and take of safely?

- a) Ground Control Safety Checklist
- b) Helicopter Safety Chart
- c) Landing Zone Safety Checklist



# Module 04

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TAILBOARD BRIEFINGS FOR HEC  
CREWS



## **TAILBOARD BRIEFINGS FOR HEC CREWS**

## CSP RULE 1102

### Tailboards will be conducted in accordance with CSP 1102.

*Tailboard briefings associated with helicopter operations shall be held at the immediate jobsite. All crew personnel and helicopter company employees shall attend the tailboard briefing. If the work commences prior to the helicopter arriving, an additional tailboard shall be conducted prior to the commencement of helicopter work procedures.*

*All crew members and the helicopter company employees shall attend the tailboard to facilitate a common understanding of the work to be accomplished, the procedures which will be utilized to accomplish the work and role/responsibilities of all involved. During the tailboard all equipment including the helicopter shall be shutdown to allow all employees the ability to clearly hear, understand, and question the details of the planned work assignments during the tailboard discussion.*



# BEFORE THE TAILBOARD

Each work site must have an LZ-Lead as the person responsible for all helicopter operations in and around the LZ.



LZ-lead must have the latest copies of all recent manuals and regulations (HOM, Code of Safe Practices, Emergency Action Plan) at the work site.



The pilot with an employee must perform a thorough survey (aerial or on the ground) of the conditions and hazards at the work site before starting work.

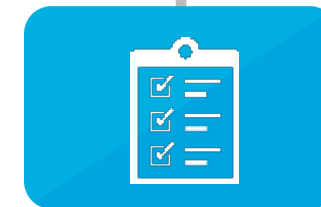


The tailboard must review the procedures to follow in the event of an emergency – emergency procedures must be discussed with the pilot during the tailboard briefing (e.g., ERP and evacuation plan).

Employee in charge (EIC) designates the LZ-Lead.



LZ-lead must have radio communications with the pilot and workers at all times. They must remain at the landing zone during all helicopter operations to ensure safe operations.

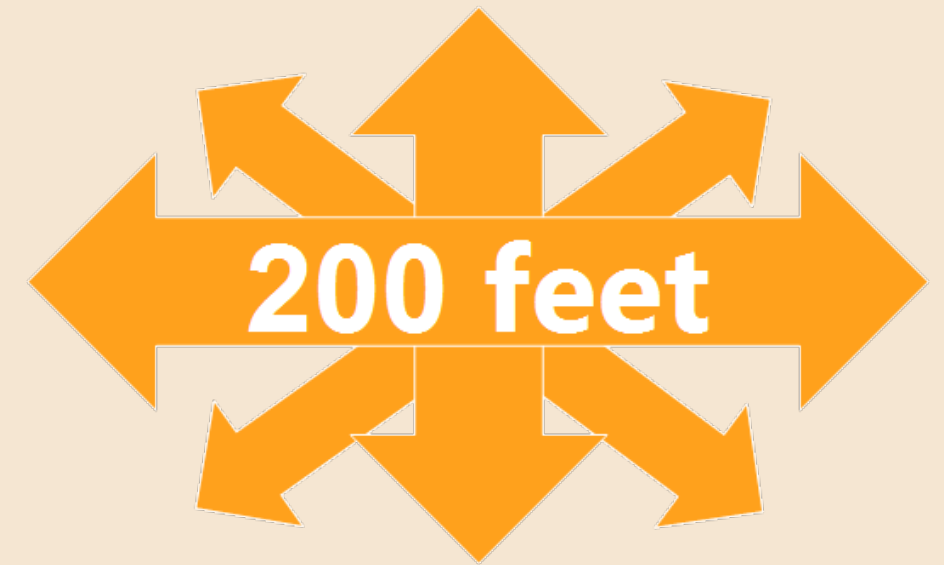


# TAILBOARD BRIEFING



Tailboard briefings associated with helicopter operations must be held daily at the primary work site or LZ.

- The tailboard briefing facilitates:
  - A common understanding of the work to be accomplished.
  - The procedures to be used to accomplish the work.
  - The roles and responsibilities of everyone involved.
- All equipment, including the helicopter must be shut down so employees can clearly hear, understand, and question the details of the planned work assignment.
- If any work starts before the helicopter arrives, the EIC must conduct an additional tailboard for all parties involved, including helicopter company employees, before the helicopter work can begin.



All crew, affected helicopter company employees, and any additional contractors involved within 200 feet of helicopter operations or flight path of helicopter (s) must attend the tailboard briefing.



# TAILBOARD CHECKLIST



## Electric Operations Pre-job Tailboard Form

Lines of Business (LOBs) may use an LOB specific tailboard, such as the Electric Operations Pre-job Tailboard Form. For consistency and in response to a CAP event, Helicopter Operations has developed a universal **Helicopter Operations Tailboard** for all helicopter work, regardless of LOB.

When any LOB uses a helicopter to assist in any project work, then in addition to the tailboard authorized for the LOB, the crew must conduct the Helicopter Operations tailboard.

<b>ELECTRIC OPERATIONS PRE-JOB TAILBOARD FORM</b>				
<i>Maintain this record in accordance with GOV-7101 ERIM Standard.</i>			<i>Check or fill out all that apply.</i>	
Work Location: _____		Date: _____	Time: _____	
GPS Latitude: _____	Longitude: _____	Job#: _____	LR/LC/EC Tag#: _____	
Person in Charge: _____		Contact#: _____	Tailboard Presenter: _____	
T&D Supervisor: _____		Contact#: _____	Circuit: _____	
Control Center: _____		Contact#: _____	Circuit Feeding Normal Yes <input type="checkbox"/> No <input type="checkbox"/>	
Emergency Placard Updated/Reviewed <input type="checkbox"/> Location: _____			Switching Log#: _____	
SSD#: _____	Physical location: _____			
ASSD#: _____	SCADA Yes <input type="checkbox"/> No <input type="checkbox"/>	OIS#: _____	Meter#: _____	
Clearance Points: _____				
<b>Section 1 - Scope of Work</b> <input type="checkbox"/> Transmission <input type="checkbox"/> Distribution <input type="checkbox"/> Tower				
Contractor Onsite Yes <input type="checkbox"/> No <input type="checkbox"/> Contractor(s): _____				
Environmental released to construction (ERTC) in job package? Yes <input type="checkbox"/> No <input type="checkbox"/>			ERTC reviewed? Yes <input type="checkbox"/> N/A <input type="checkbox"/>	
Grounding Required Yes <input type="checkbox"/> No <input type="checkbox"/> Hot Stick Yes <input type="checkbox"/> No <input type="checkbox"/> Rubber Glove Yes <input type="checkbox"/> No <input type="checkbox"/> Bare hand Yes <input type="checkbox"/> No <input type="checkbox"/>				
Identify the work to be done: _____ _____ _____				
<b>Section 2 – Hazards Associated with the Work</b>				
Situation/Resolutions - Controls: _____ _____ _____				
<b>Section 3 – Employee Responsibilities, PPE Requirements</b>				
<input type="checkbox"/> PPE <input type="checkbox"/> 4-core stretches/warm-up <input type="checkbox"/> Human Performance Tools <input type="checkbox"/> Employee Readiness <input type="checkbox"/> Worksite Protection				
<input type="checkbox"/> Εργασία ΠΡΕ Βασική/αποδοτική:				
<input type="checkbox"/> PPE <input type="checkbox"/> 4-core stretches/warm-up <input type="checkbox"/> Human Performance Tools <input type="checkbox"/> Employee Readiness <input type="checkbox"/> Worksite Protection				
<b>Section 3 – Employee Responsibilities, PPE Requirements</b>				
_____				
_____				

# TAILBOARD CHECKLIST – CONT.

## Helicopter Operations Tailboard



### Helicopter Operations Manual, Appendix 10 - Tailboard Checklist

The tailboard checklist is documentation of a discussion about job safety, risks, and mitigation that you have had with the HEC crew. The signed document detailing the discussion is a record that must be retained.



Records management is a requirement, not an option.

Without having a reliable record of the work performed, there is no way to verify what was done.



HOFM, Appendix 10, page 3 of 4 (Rev 1) 6/20/2017

### HELICOPTER OPERATIONS TAILBOARD

(Optional) See LOB tailboard for header information; X out duplicated information.

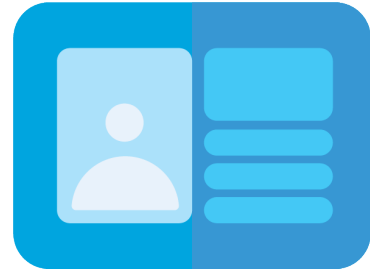
Work Location	Time: ____:____ AM / PM	Crew Lead
	Date: ____/____/____	
Helicopter Contractor		First Line Supervisor
Pilot's Name	Tailboard Conducted by:	Landing Zone Lead (10.3.3; 11.13)

**Pre-Job Planning** (see TRAN-4004M – JA01)

Checklist Items:	Yes	No	NA
Is the <i>Code of Safe Practices</i> and <i>Helicopter Operations Field Manual</i> on site?			
Are all employees/contractors present, and listening (everyone participates)?			
Has helicopter job scope and what is to be accomplished for the day, been reviewed?			
Has the Landing Zone (LZ) Lead been identified?			
Has Radio Communications with the Helicopter, LZ, Line Workers, Traffic Control been confirmed?			
Have the escape routes been established while working under the helicopter?			
Does the pilot need to perform a walk-down survey of the jobsite?			
Did the pilot do an aerial inspection for hazards/conditions at jobsite site? (HOFM, 10.3.3)			
Did the pilot verify the Helicopter Safe Working Distance?			
--Helicopter Horizontal Safe Work distance (1/2 diameter of rotor)			
--Helicopter Vertical Safe work distance (10 feet marker below skid)			
--Helicopter Vertical Safe work distance (10 feet marker below skid)			
--Helicopter Horizontal Safe Work distance (1/2 diameter of rotor)			
Did the pilot verify the Helicopter Safe Working Distance?			
Did the pilot do an aerial inspection for hazards/conditions at jobsite site? (HOFM, 10.3.3)			
Does the pilot need to perform a walk-down survey of the jobsite?			

# DURING THE TAILBOARD

As part of the tailboard, do the following:



Check all HEC ID cards for specific qualification of work being performed.



Communicate the specific radio channel to all employees involved in the helicopter safety tailboard or flight notification for patrol.



Make sure pilot knows that they must maintain the required 10-foot safe working distance between the helicopter landing struts and any wire, conductor, or structure.



Ensure that all work site employees understand their individual assignments.



Identify all public safety hazards to mitigate all risks from flight operations.



Ensure that members of the crew are clothed properly and wearing the required PPE.

# PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR HEC



Circle the PPE required for HEC work.



# TAILBOARD RESPONSIBILITIES FOR EIC



## ★ Additional responsibilities of EIC:

- Notify the pilot whether the line being worked on is energized or de-energized including any supplemental lines on structures.
- Ensure a minimum clearance of 30 feet between any energized power line and any part of the helicopter and load combination, unless under the direct supervision of a qualified electrical worker.
- Ensure the pilot is informed of grounding practices, and of the location and type of the grounding devices installed on the line section being worked.
- Ensure the pilot is aware of proper work procedures to be used, ensuring the safety of the workers and the pilots at all times.

# WHO WILL SIGNAL THE PILOT



Determine who will signal the pilot from the ground.

- Only one designated person at each landing zone (including receiving sites) is authorized to give the pilot hand/head signals during the operation.
- Ensure that the designated employee wears an approved traffic vest or provide another method of identification so the pilot can easily recognize the designated signaler.
- Ensure that the pilot reviews standard helicopter hand/head signals with the designated employee(s) during the tailboard briefing to help reduce the risk of confusing or misunderstood hand signals.



# HELICOPTER HAND AND HEAD SIGNALS

As part of the tailboard, review the [head and hand signals](#) so that every member of the crew has a common understanding.





- When using head signals, mark the top of the hard hat with black tape in a “V” so that the pilot can easily see and understand signals.
- The hand and head signals used for helicopter operations are:
  - ✓ Raise
  - ✓ Lower
  - ✓ Hold
  - ✓ Capture



## Helicopter Operations Manual, Appendix 6 – Helicopter Hand and Head Signals

- Hand and head signals are the most common means of communication with the helicopter.
- When two employees are ready to lift off together (leaving a structure or the ground) – **both employees must signal up and down** to inform the pilot that both are ready to lift off.

# HELICOPTER HAND AND HEAD SIGNALS, CONT.

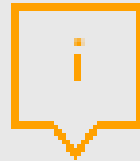
Raise	Lower	Hold	Capture
<p>Head nodding up and down deliberately means go up.</p> <ul style="list-style-type: none"> <li>When the head movement stops, the pilot will stop for the employee who is still maintaining control of the line or load.</li> <li>If the head movement continues and the employee lets go of the line or load, the pilot will continue to rise and either look for another signaler or leave the area with the load.</li> </ul>	<p>Head movements from side to side deliberately, means come down.</p> <ul style="list-style-type: none"> <li>When the head movement stops the pilot will stop for the employee who is still maintaining control of the line or load.</li> </ul>	<p>Arms straight out at 90 degrees means hold.</p> <ul style="list-style-type: none"> <li>This signal helps the pilot know when he is in the right area to drop or receive a load when depth perception is difficult.</li> </ul>	<p>This signal is seen by the pilot looking down into a structure, where seeing the employee is difficult.</p> <ul style="list-style-type: none"> <li>When the pilot gets the load close to an obscure employee in a tall structure, he will see a hand come out. The pilot will know he is close and can make adjustments.</li> <li>At times an employee may put his arm out to let the pilot know the location they are in, before trying to take the load or hook in.</li> </ul>
			

# SUSPENSION TRAUMA



The risk of suspension trauma occurs when a worker remains suspended in their harness for a long period of time.

- The longer a worker is suspended in a fall protection harness, the greater the risk for suspension trauma or death.
- Regardless of distance, HEC employees must not be suspended in their harness for more than 15 minutes.



To avoid suspension trauma, “pump” legs and raise knees.



# EMERGENCY ACTION PLAN



The Emergency Action Plan placard identifies emergency contact numbers and job site information to use in case of emergency during helicopter operations.

- First call 911 or appropriate switching center to request emergency medical assistance.
- Provide as much emergency medical information and detail as possible.
- Provide physical location information.



In the event of a medical injury while performing HEC work, all crew members should be prepared to:

- Use the contact and location information on the Emergency Action Plan (EAP) to call for help.
- As necessary, perform CPR and/or basic first-aid until medical professionals arrive.

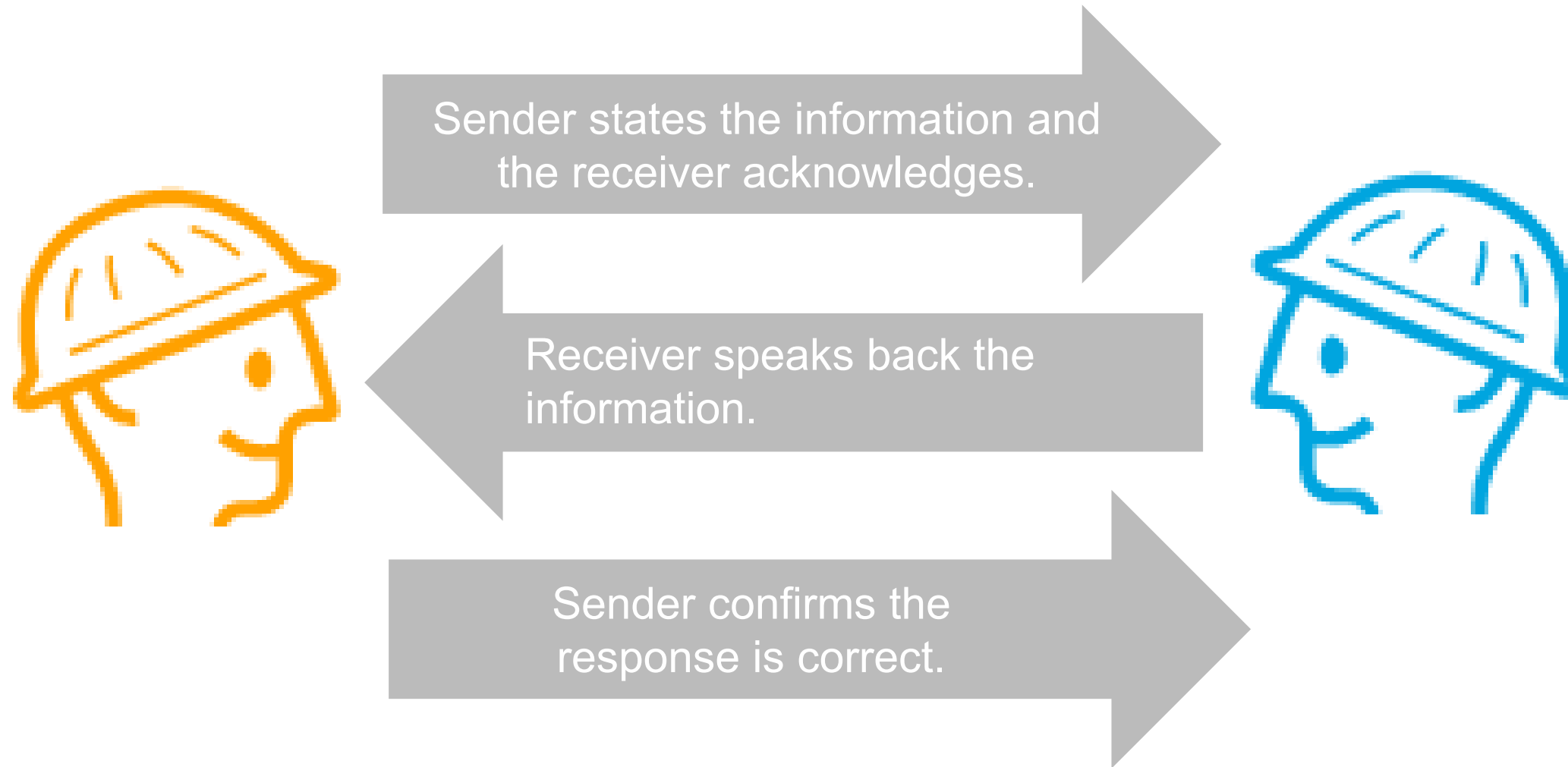


If emergency medical services are delayed or unavailable, transport the victim by the best method available, taking care not to cause additional injury or complicate an existing one.

- This may not be the designated LZ. Terrain or location may make it necessary to transport a worker to an alternative location.
- If possible, an employee should accompany the injured worker.

# USING THREE-WAY COMMUNICATION

Using three-way communication when performing HEC work minimizes risk and increases awareness and communication.



Use **three-way communication** to promote a reliable transfer of information and understanding to ensure that the correct action is taken.

# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

- 1** All crew, affected helicopter company employees and any additional contractors involved within \_\_\_\_\_ feet of helicopter operations must attend the tailboard.

---

  - a) 100
  - b) 200
  - c) 175
  
- 2** During the tailboard, the employee in charge (EIC) is responsible for (select two):

---

  - a) Notifying the helicopter pilot whether the line being worked on is energized or de-energized.
  - b) Determining who will signal the pilot from the ground at the LZ.
  - c) Ensure radios are working correctly, and at the correct frequency.
  
- 3** What is the required safe working distance between the helicopter landing struts and any wire, conductor or structure?

---

  - a) 10 feet
  - b) 15 feet
  - c) 25 feet

# KNOWLEDGE CHECK (CONT.)

Complete the questions and be prepared to share your answers with the class.

**4** In the event of a medical injury while performing HEC work, all crew members should prepare to (select three):

- a) Use the contact and location information on the Emergency Action Plan (EAP) to call for help.
- b) As necessary, perform CPR and/or basic first-aid until medical professionals arrive.
- c) If emergency medical services are delayed or unavailable, do not transport by any other method as you may complicate an existing injury
- d) Accompany the injured employee.

# KEY TAKEAWAYS

## You should now be able to:

- Describe pre-tailboard activities.
- List and explain the information that must be included in a tailboard.
- Explain how to prevent suspension trauma.
- Describe the HEC rope.
- Describe emergency protocols during helicopter operations.





# Module 05

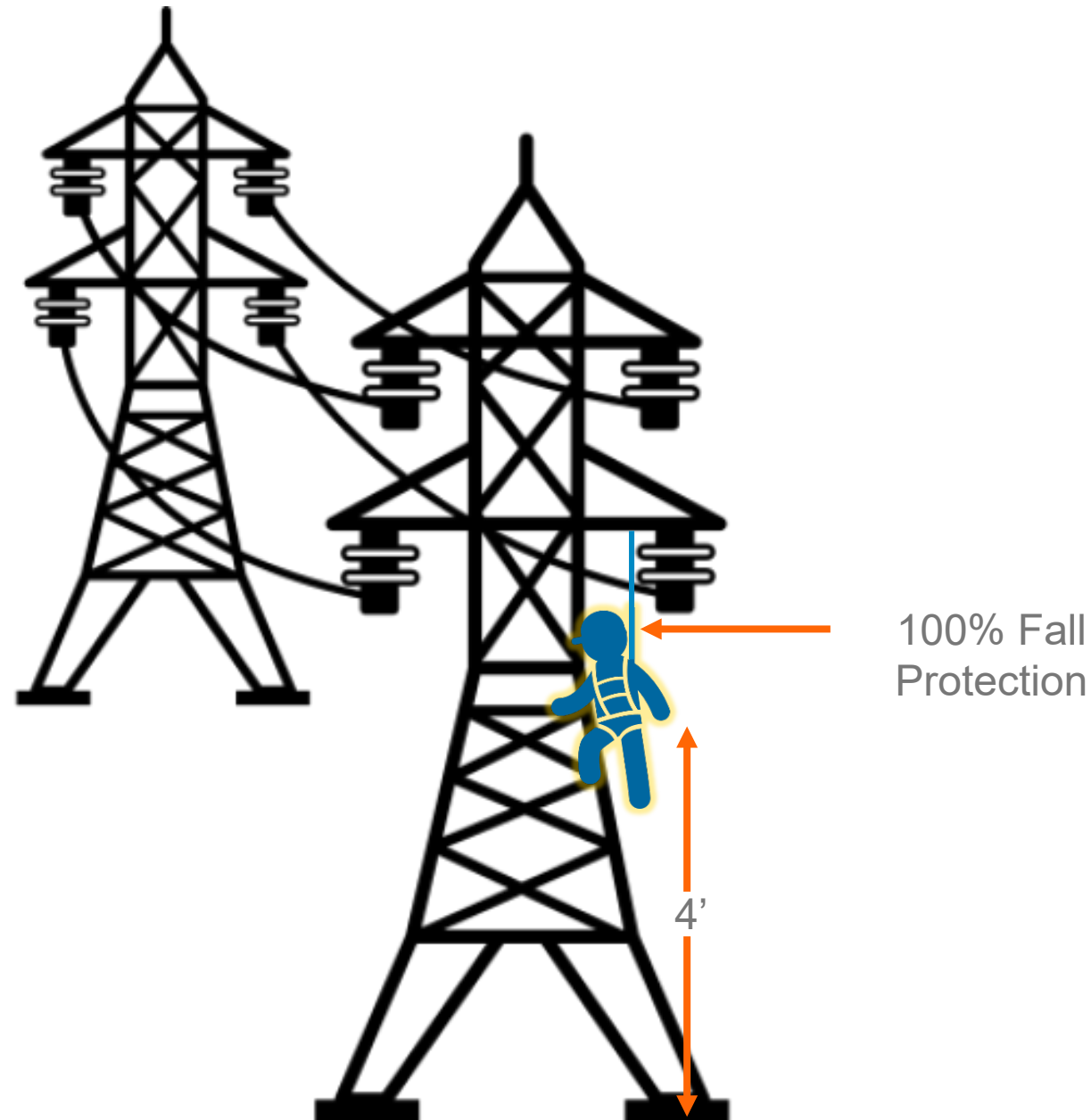
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HUMAN EXTERNAL CARGO EQUIPMENT



# HUMAN EXTERNAL CARGO EQUIPMENT

# FALL PROTECTION REGULATORY REQUIREMENTS



## Regulatory requirements

- Employees working in elevated locations more than **4 feet** above the ground on poles, towers, or similar structures shall use a personal fall arrest system.
- Personal fall protection systems can consist of fall arrest, work-positioning, or work restraints.
- Regardless of whether you are the first person to ascend or descend a steel structure, it is **mandatory** that you use 100% Fall Protection if you are climbing over 4 feet.

# EQUIPMENT REQUIRED FOR HEC



HEC Harness



Safety Lanyard



HEC Line Worker Helmet



Rescue Knife



Belly Band



Personal Flotation Device



HEC Rope



Fall Protection Kit

# HEC SPECIALIZED EQUIPMENT



HEC Harness



Safety Lanyard



HEC Helmet



HEC Rescue Knife



Belly Band



Personal Flotation Device



HEC Rope



Fall Protection Kit



Tap the icons to explore the specialized equipment for HEC.

# HEC HARNESS



## HEC Harness

The HEC harness provides a fast, easy and safe way for a helicopter to position an HEC employee. An HEC harness is **required fall protection equipment** for HEC employees.

- The harness used for HEC transfers must be equipped with both a front D-ring (e.g. front sternal D-ring) and a rear dorsal D-ring.
- The side-positioned D-rings are used for work positioning while on a structure.
- Employees must use only approved harnesses.

# HEC HARNESS – CONT.



## HEC Harness

When an HEC employee is suspended from a helicopter, the employee must be suspended using only the **harness's front sternal D-ring**, as illustrated in this picture.

- Make sure that the harness is properly fitted and is snug.



1 2 3

# HEC HARNESS – CONT.



HEC Harness



Yates Harness



Buckingham Harness

1 2 3

# SAFETY LANYARDS

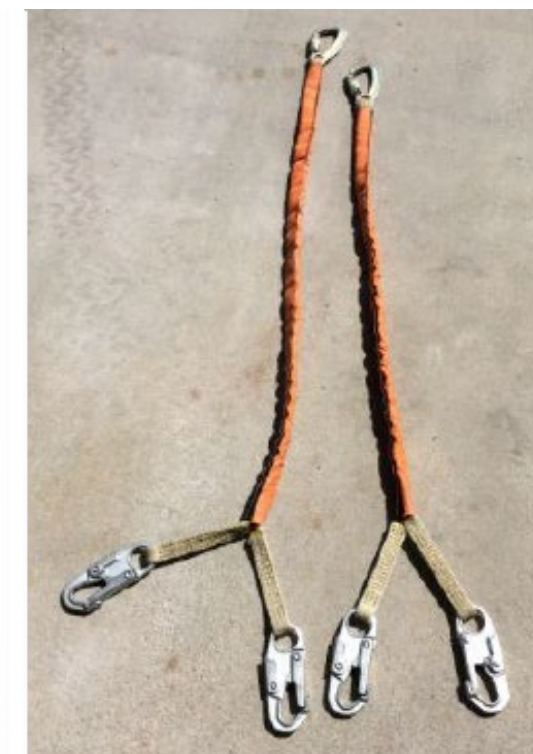
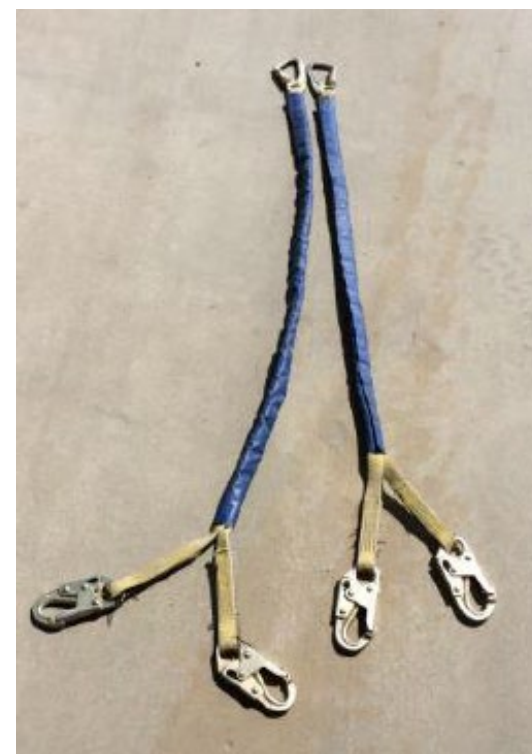


Safety Lanyard

Each HEC worker must have a **lanyard system attached between the sternal D-ring of the harness** and the helicopter load line.

The lanyard and the means for attaching it, must have a minimum breaking strength of 5,000 pounds and provide an easy disconnect for the line-worker.

**NOTE:** If the HEC worker's harness is equipped with a fly seat attach to the fly seat D-rings.



# HEC LINE WORKER HELMET



HEC Helmet

Wearing an **approved** HEC line worker helmet is **mandatory** while performing helicopter work.

- Make sure that the helmet is properly fitted with the chinstrap fastened to prevent the possibility of the helmet being blown off.
- In addition to the approved helmet, HEC workers must wear approved eye and hearing protection when near an operating helicopter.



# HEC RESCUE KNIFE



HEC Rescue  
Knife

All HEC employees are **required** to carry a rescue knife to be used solely for **emergencies**. The rescue knife will be secured with a lanyard and will be readily accessible during HEC flights and specifically dedicated to cut the “A” frame assembly in an emergency situation.

- Emergencies may include: loss of tail rotor function, transmission failure, compressor stall, engine failure, or hydraulic boost pump failure, etc.
- The rescue knife should be secured to the HEC harness in a readily accessible location in the chest area, accessible with either hand.

1

2

# HEC RESCUE KNIFE



HEC Rescue Knife

Below are two **approved** knives for HEC and the order codes:



Code: CRK 2510ER



Code: SRM 2779372

# HEC PERSONAL SAFETY DEVICE (BELLY BAND)



Belly Band

Helicopters designed to suspend an HEC employee must attach the load line to the helicopter using two separate attachment points:

- The helicopter's **cargo hook** (attached to helicopter frame).
- A personal safety device generally referred to as a **belly band**.

The belly band is used with all long-line work procedures, and replaces the earlier 3-ring personal safety device.



## HEC PERSONAL SAFETY DEVICE (BELLY BAND) - CONT.



Belly Band

Each attachment point must have its own release mechanism controlled by the pilot.

- This prevents inadvertent release and provides the HEC employee with an **additional level of safety**.
- Provide the pilot with an opportunity to **release the load line during an emergency**, while the HEC employee is attached to both a structure and the helicopter.



1

2

# PERSONAL FLOTATION DEVICE

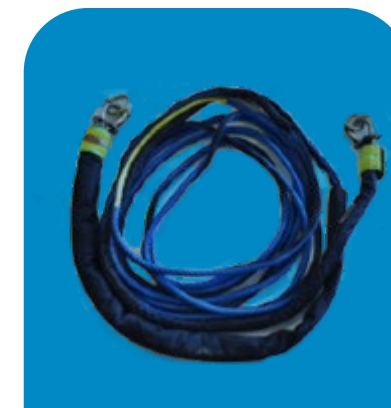


Personal Flotation  
Device

An **approved PFD** (personal flotation device) must be readily available by each individual on board the aircraft when conducting operations beyond the gliding distance to shore when operating over water, and during all helicopter hovering flights over water sources such as lakes, and coastal waters.

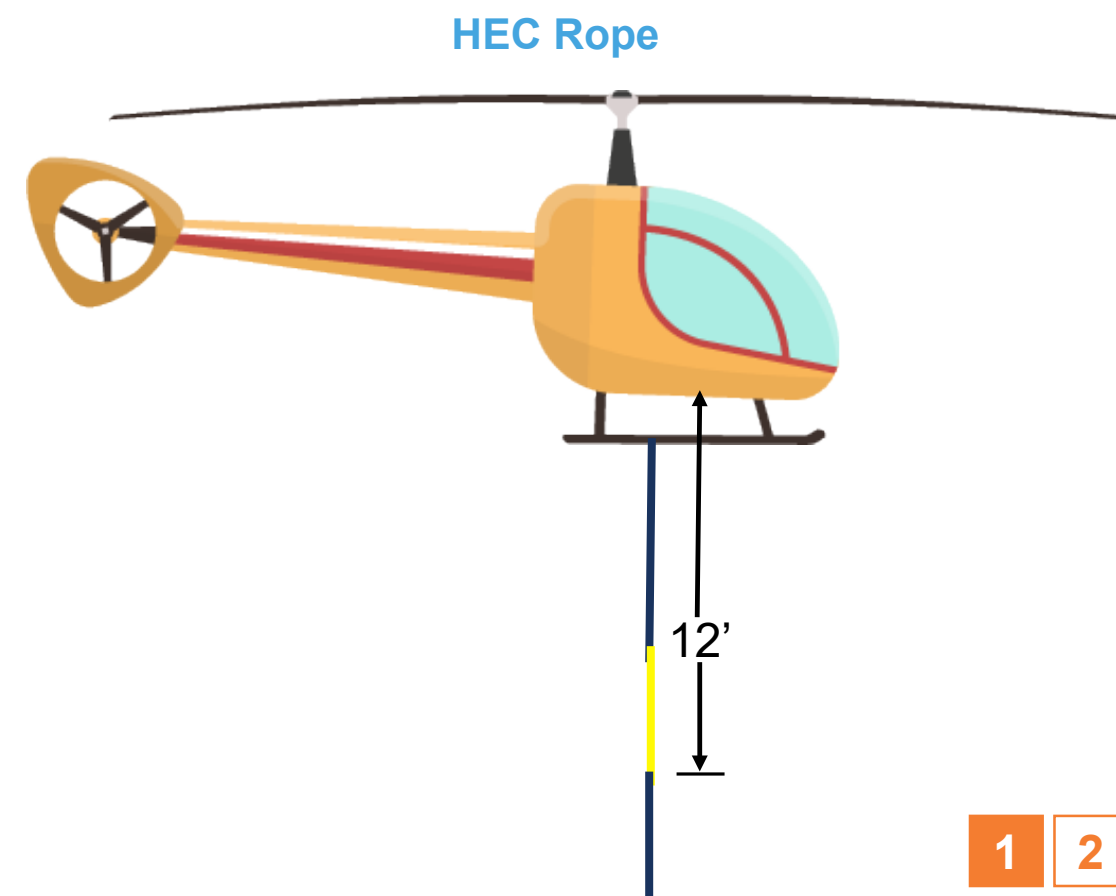
- HEC employees are required to wear a PFD when operating over water.
- Automatic inflation (water activated) personal flotation devices are not allowed.

# HUMAN EXTERNAL CARGO ROPE



The **Human External Cargo** rope is used to suspend HEC beneath the helicopter during HEC operations.

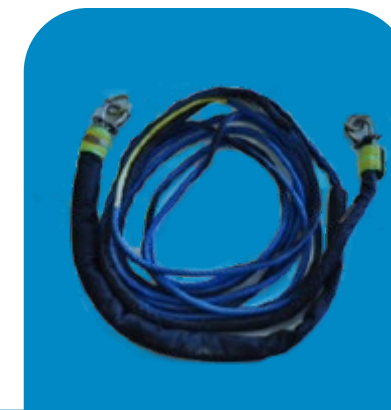
- The HEC rope has a distinctive blue protective jacket and a yellow marker 12 feet from the top of the line.
- This marker allows the pilot a visual reference to maintain the 10-foot safe working distance.



1

2

# HUMAN EXTERNAL CARGO ROPE – CONT.



HEC Rope

The **Human External Cargo** rope is used to suspend HEC beneath the helicopter during HEC operations.

- The HEC rope must not be used for general cargo and clearly marked **“For HEC Use Only”**.
- The HEC rope is not to be used outside of PG&E without written consent of manager of Helicopter Operations.



1

2

# FALL PROTECTION INDIVIDUAL KIT



The **Individual Kit** is a small bag that is attached to the HEC harness or the employees leg to hold the tools and equipment needed to maintain **100% tie-off**.

- ASAP lock (fall arrester)
- Work positioning lanyard with the rope adjusting device (RAD) positioning strap.
- Shock-absorbing lanyards
- Vertical lifeline ropes
- Throw weight rope
- Rated redirects
- Carabiners

Fall Protection Kit



# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

**1** Regulatory requirements require that employees shall use a personal fall arrest system when working in elevated locations more than \_\_\_\_\_ above the ground on poles, towers, or similar structures.

---

- a) 10 feet
- b) 6 feet
- c) 4 feet

**2** When an HEC employee is suspended from a helicopter, the employee must be suspended using only the harness's: (Select all that apply)

---

- a) Front sternal D-ring
- b) Back dorsal D-ring
- c) Side D-ring
- d) Approved fly seat

**3** Each HEC worker must have a lanyard system attached between the \_\_\_\_\_ of the harness and the helicopter load line. (Select all that apply)

---

- a) Back dorsal D-ring
- b) Front sternal D-ring
- c) Side D-ring
- d) Fly seat D-ring

# KNOWLEDGE CHECK (CONT.)

Complete the questions and be prepared to share your answers with the class.

**4** What piece of equipment allows the pilot to release the load line during an emergency, while the HEC employee is attached to both a structure and the helicopter?

---

- a) HEC rope
- b) Rope adjusting device
- c) Belly band

# KEY TAKEAWAYS

## You should now be able to:

- Identify and explain the purpose of the special equipment required for HEC Operations:
  - HEC harness, HEC rope
  - HEC helmet, hearing protection, and eye-protection
  - Fall protection individual kit
  - HEC personal safety device (belly band)
  - Safety lanyard, rescue knife
  - Personal flotation device (as required)





# Module 06

---

HUMAN EXTERNAL CARGO PRE-FLIGHT  
SAFETY CHECKS



# HUMAN EXTERNAL CARGO PRE-FLIGHT SAFETY CHECKS

---

# GENERAL PROVISIONS



## Before beginning HEC operation:

The HEC crew confirms the pilot knows the exact location of work to be performed.



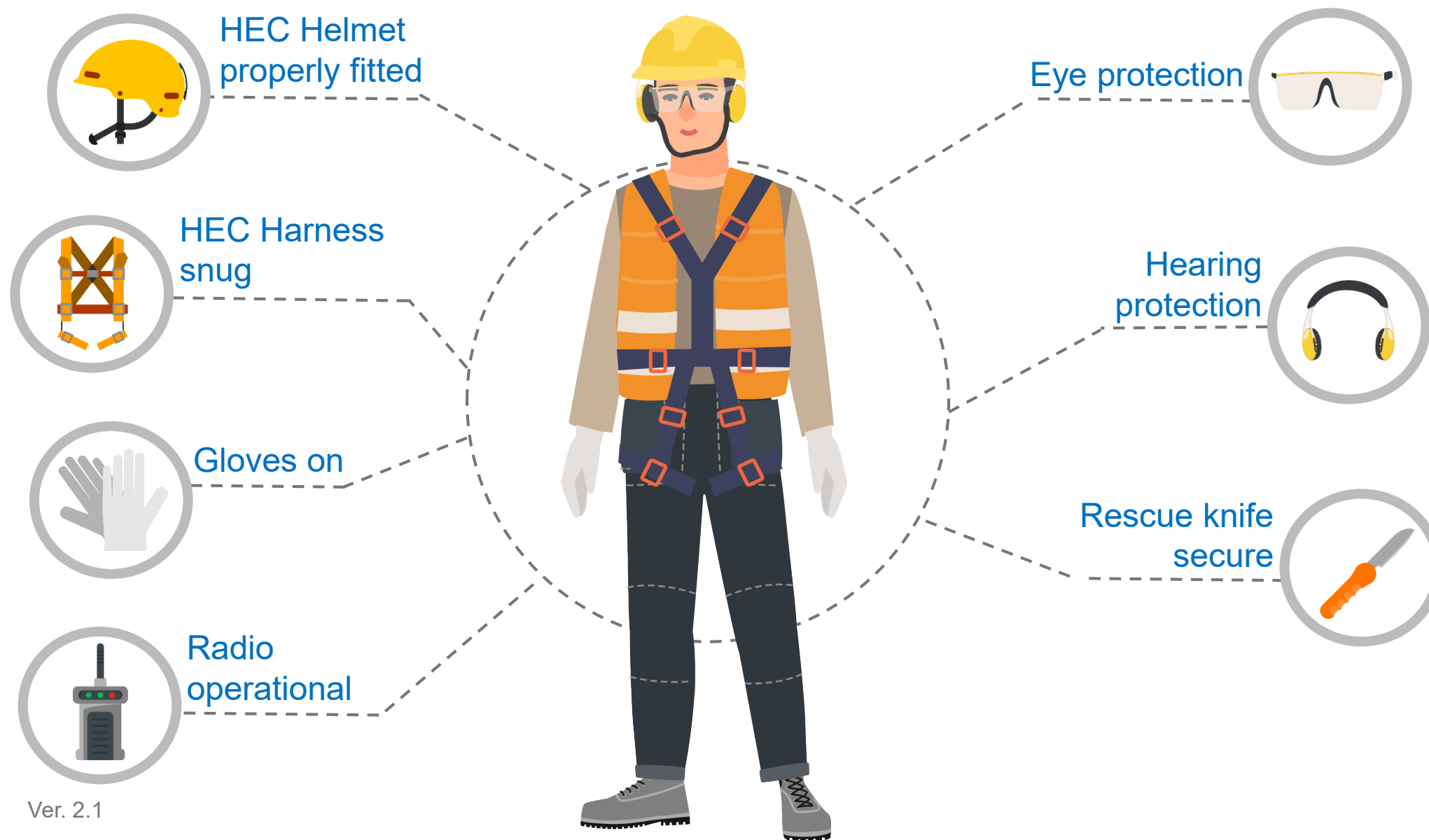
## The HEC crew and pilot must appraise and plan for mitigation of:

- Any special conditions
- Safe working distances
- Possible working hazards



# PERSONNEL SAFETY CHECK

Each individual **will** check **themselves** and their **partner** before operations commence. Inspections will be **visual** and **physical** (see and pull) from head to toe and will adapt to specific equipment used.



Ver. 2.1



## The 11-point buddy check includes:

- ✓ HEC helmet is properly fitted, chin strap fastened.
- ✓ Approved eye protection secured.
- ✓ Flash resistant clothing properly worn – no loose items.
- ✓ Gloves on.
- ✓ Chest harness properly fitted and snug.
- ✓ Leg straps securely fastened and snug.
- ✓ All buckles attached and secured.
- ✓ Snap hooks (carabiners) attached to A-frame and locked.
- ✓ Hearing protection available and in use.
- ✓ Radio operational and on correct frequency.
- ✓ Rescue knife secure and easily available.



# INSPECT HEC PERSONAL SAFETY DEVICE ATTACHMENTS

Before beginning operations, review with the pilot that the **HEC personal safety device** (belly band) attachment points are **secure**.

What should you be looking for when you do a visual inspection of the belly band?

**DO NOT TOUCH!**



**ADVISE THE PILOT OF ANY CONCERNS**



# INSPECTIONS BEFORE WORKING

When the **HEC operations** involve transferring a worker from a helicopter or performing work on **conductors**, the employees assigned to perform the work must:



Inspect the supporting structures and conductors before performing the work.

- Inspect the supporting structures and conductors before performing the work to identify any condition that might jeopardize an employee's personal safety or raise concern for any employee, or the pilot.




If potentially unsafe conditions are discovered, the conditions must be corrected before performing work.

- Stop all work and notify your supervisor and EIC.
- If the conditions cannot be corrected, use an alternate work method.



# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or Employee in Charge	 <p>Tap each role to explore the responsibilities of workers involved in HEC activities.</p>
LZ-Lead	
Pilot	
Lineman/Towerman	
Line Work Support Personnel	
Helicopter support	

# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or  
Employee in Charge

LZ-Lead

Pilot

Lineman/Towerman

Line Work Support  
Personnel

Helicopter support

The **Employee in Charge (EIC)** has the obligation to verify that all roles are supported and that the other responsibilities are carried out by those assigned.

Chapter 8, Section 4 of the Helicopter Operations Manual outlines the roles and responsibilities of the employee in charge.

## 9 Crew Foreman or Employee in Charge

9.1 The employee in charge has the obligation to verify that all roles are supported and that the other responsibilities are carried out by those assigned. The employee in charge:

- Must be qualified in HEC.
- Checks the radio to verify it is operating correctly and on the correct frequency to communicate with the line crew and landing zone crew.
- Conducts a detailed tailboard briefing of the work to be done by all workers and pilots including the *Emergency Action Plan*.
- Coordinates all work activities pertaining to the line work.
- Approves qualified personnel for job responsibilities, including verification that all employees involved in HEC operations have completed the required training.
- Maintains communications with the line switching center as necessary.
- Reports any accidents or emergencies.
- Stops work anytime unsafe conditions or behaviors are observed until the job can be completed safely.

# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or Employee in Charge	<p>Each work site must have someone in charge as the person responsible for all helicopter operations in and around the LZ – this person must be <b>HEC qualified</b>.</p> <p>Chapter 8, Section 14 of the Helicopter Operations Manual outlines the roles and responsibilities of the LZ-Lead</p> <div data-bbox="917 786 2550 1557" style="border: 1px solid black; padding: 10px;"> <p><b>10 LZ-Lead</b></p> <p>10.1 Each work site must have someone in charge as the person responsible for all helicopter operations in and around the LZ—<b>this person must be HEC qualified</b>. Responsibilities include:</p> <ul style="list-style-type: none"> <li>• Maintain <b>at the work site</b>, the current TRAN-4004M <i>Helicopter Operations Field Manual</i></li> <li>• Maintain <b>at the work site</b>, the current <i>Code of Safe Practice (CSP)</i></li> <li>• Maintain <b>at the work site</b>, a current department specific Emergency Response Plan or Emergency Action Plan</li> <li>• Must have radio communications with the pilot and workers at all times</li> <li>• Must remain at the landing zone during all helicopter operations</li> <li>• Ensure that all crew have proper PPE</li> <li>• Ensure all employees understand their individual assignments</li> <li>• Ensure that during any change in condition a new tailboard is given</li> </ul> </div>
LZ-Lead	
Pilot	
Lineman/Towerman	
Line Work Support Personnel	
Helicopter support	

# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or Employee in Charge	<p>Helicopter pilots must not perform any work procedures for which they are not <b>trained and qualified</b>.</p> <p>Chapter 8, Section 19 of the Helicopter Operations Manual outlines the roles and responsibilities of pilots.</p> <div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p><b>11 Pilot</b></p> <p>11.1 Helicopter pilots must not perform any work procedures for which they are not trained and qualified. Helicopter pilots that fail to produce their helicopter identification cards will not be allowed to perform any helicopter human external cargo procedures.</p> <ul style="list-style-type: none"> <li>• Contributes to tailboard on flight operations.</li> <li>• Inspects HEC equipment and rigging prior to the job or mission.</li> <li>• Computes helicopter performance margins.</li> <li>• Completes an equipment and aircraft check.</li> <li>• Inspects the HEC rope and all attachments of the HEC rope to the aircraft.</li> <li>• Checks to verify release systems are operational and working correctly (in conjunction with the helicopter support personnel).</li> <li>• Verifies the operational integrity of the electric hook system (in conjunction with the helicopter support personnel).</li> <li>• Secures loose equipment or removes items from the cabin.</li> <li>• Checks the radio to verify it is operating correctly and on the correct frequency to communicate with the line crew and landing zone crew.</li> </ul> </div>
LZ-Lead	
Pilot	
Lineman/Towerman	
Line Work Support Personnel	
Helicopter Support	

# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or Employee in Charge	<p>Chapter 8, Section 12 of the Helicopter Operations Manual outlines the roles and responsibilities of lineman and towerman.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p><b>12 Linemen / Towermen</b></p> <ul style="list-style-type: none"> <li>• Actively participates in tailboard.</li> <li>• Remains a safe distance from the helicopter and in plain view of the flying pilot when approaching the helicopter prior to being lifted.</li> <li>• Communicates pertinent information to the pilot:             <ul style="list-style-type: none"> <li>○ Structure number and what level or position</li> <li>○ When they are free of the HEC rope and everything is in the clear</li> </ul> </li> <li>• Notifies the pilot when their work is completed and they are ready to be moved.</li> <li>• Inspects the HEC rope rigging to ensure all connections are in place and not side-loaded before being lifted.</li> <li>• Checks the fitting, connections, and the integrity of their harness to ensure they are safe to use.             <ul style="list-style-type: none"> <li>○ Snap hooks closed and locked</li> <li>○ Carabiners closed and locked</li> </ul> </li> <li>• Ensures all required PPE is in place.</li> <li>• In conjunction with the pilot and via head/hand communications as tail-boarded, maintains working distances from all lines (energized and de-energized).</li> <li>• Stops work anytime unsafe conditions or behaviors are observed until the job can be completed safely.</li> </ul> </div>
LZ-Lead	
Pilot	
Lineman/Towerman	
Line Work Support Personnel	
Helicopter Support	

# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or Employee in Charge	<p>Chapter 8, Section 13 of the Helicopter Operations Manual outlines the roles and responsibilities of line work support personnel.</p> <div data-bbox="911 626 2688 1209" style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p><b>13 Line Work Support Personnel (Groundmen)</b></p> <ul style="list-style-type: none"> <li>• Actively participates in tailboard.</li> <li>• Provides support as needed.</li> <li>• Remains a safe distance from the helicopter and in plain view of the pilot when working near the LZ.</li> <li>• Prepares loads to be flown out (e.g., ladders, grounds, tools, travelers)</li> <li>• Wets down the LZ to control dust when appropriate.</li> <li>• Stops work anytime unsafe conditions or behaviors are observed until the job can be completed safely.</li> <li>• Watches to make sure no civilians approach or enter the landing zone. Acts as guard to keep the landing zone clear of unauthorized personnel when required.</li> </ul> </div>
LZ-Lead	
Pilot	
Lineman/Towerman	
Line Work Support Personnel	
Helicopter Support	



# HEC ROLES AND RESPONSIBILITIES

Crew Foreman or Employee in Charge	<p>Chapter 8, Section 10 of the Helicopter Operations Manual outlines the roles and responsibilities of helicopter support personnel (e.g., fueler, mechanic)</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p><b>14 Helicopter Fueler / Support</b></p> <ul style="list-style-type: none"> <li>• Actively participates in tailboard.</li> <li>• Has radio communications with pilot.</li> <li>• Installs a wind indicator at the landing zone.</li> <li>• Attaches rigging to helicopter as appropriate.</li> <li>• Checks to verify release systems are operational and working correctly (in conjunction with the pilot).</li> <li>• Verifies the operational integrity of the electric hook system (in conjunction with the pilot).</li> <li>• Provides support as requested by the pilot.</li> <li>• Ensures no smoking or open flames get any closer than 100 feet of the fuel truck at any time.</li> <li>• Stops work anytime unsafe conditions or behaviors are observed until the job can be completed safely.</li> </ul> </div>
LZ-Lead	
Pilot	
Lineman/Towerman	
Line Work Support Personnel	
Helicopter Support	

# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

**1** What should you do if you identify a problem with the helicopter's secondary safety system (belly band) during an inspection?

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- a) Correct yourself to save time.
- b) Don't touch it and immediately notify the Pilot.
- c) Call your Supervisor.

**2** What should you do if you discover potentially unsafe conditions with the supporting conductors and structures before performing HEC work? (Select all that apply)

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- a) Correct the problem and use an alternate work method if it can't be corrected.
- b) Stop all work and notify your supervisor and EIC.
- c) Continue to perform the work after notifying the pilot of the unsafe conditions.

**3** Who is responsible for verifying that all roles involved in HEC work are supported and that the other responsibilities are carried out by those assigned?

---

- a) Pilot
- b) Employee in Charge
- c) Crew Supervisor

# KEY TAKEAWAYS

## You should now be able to:

- Explain the general provisions for transporting or transferring HEC.
- Explain the safety checks that must be conducted before beginning HEC work.
- Explain the purpose of site inspections prior to beginning operations.
- Describe the roles and responsibilities of workers involved in HEC activities.





# Module 07

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PERFORMING HUMAN EXTERNAL  
CARGO TRANSFERS



# PERFORMING HUMAN EXTERNAL CARGO TRANSFERS

## OBJECTIVES

- Demonstrate the proper takeoff procedures for HEC operations.
- Outline the key points for departure safety.
- Identify proper safety procedures and precautions for ground to ground, ground to steel, and ground to wood pole transfers.
- Demonstrate proper procedures to transfer from ground to ground, to or from a steel structure, and to and from a wood pole.
- Demonstrate extraction procedures to or from a steel structure, and wood pole.

# GENERAL TAKEOFF PROCEDURE



The helicopter hovers above the HEC employee(s) while the employee(s) **attaches to the helicopter HEC lanyards**. Be aware of blade wash and flying debris. Up to **two HEC employees** may be transferred at the same time to a steel structure.



The HEC employee attaches the lanyards between the harness's proper D-ring and helicopter HEC rope.

The pilot lifts the HEC employee slowly, ensuring that nothing hangs up as helicopter departs.

1

The pilot positions the helicopter above HEC employee allowing access to helicopter lanyards.

2

3

When securely attached, HEC employee signals to the pilot that it is safe to lift off.

- HEC stands firmly on ground, straight up, without jumping, sitting, or leaning back, allowing pilot to pull up.

4

## GENERAL TAKEOFF PROCEDURE – CONT.



When transferring **two HEC employees** at the same time to a steel structure:

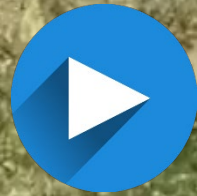


The pilot and HEC must agree that it is safe to transfer both workers simultaneously.



If either pilot or workers feel it is unsafe, the pilot will limit the transfer to one worker at a time.

# TAKEOFF PROCEDURE - VIDEOS



ONE HEC EMPLOYEE



TWO HEC EMPLOYEES

# DEPARTURE SAFETY



After HEC employee signals it is clear to take off, the pilot and employee must ensure that **nothing is hanging from HEC employee's belt or anywhere else** that would tangle on any obstructions as the helicopter moves away.



Load line is clear of any obstructions.



The pilot will always move helicopter away from ground in slow and cautious manner.



IF something does catch, THEN the helicopter can be maneuvered back easily and HEC employee can free the obstruction.



## DEPARTURE SAFETY, CONT.



This is an example of what can happen if you don't make sure that **everything is clear** when the pilot lifts you off the structure.



Make sure to check **yourself** and your **partner** before signaling that it is clear to take off.

# GROUND TO GROUND LANDING



HEC employee must prepare to **land properly**:

- Knees bent
- Chest up
- Arms bent at elbow
- Land on the balls of feet



When the HEC employee is on the **ground**:

- Remove helicopter HEC lanyards from harness immediately.



Only after HEC lanyards are **detached**:

- Signal to the pilot that it is safe to depart.



# STRUCTURE LANDING GENERAL REQUIREMENTS



Special requirements must be followed when transferring an HEC employee from the **ground to a structure, as well as from a structure to another location.**



HEC employees landing on structures elevated more than 4 feet above the ground shall maintain 100% attachment.



When employees cannot maintain the required safe working distances, they must install protective grounds and follow *all* applicable protective ground rules.

# STEEL STRUCTURE LANDING



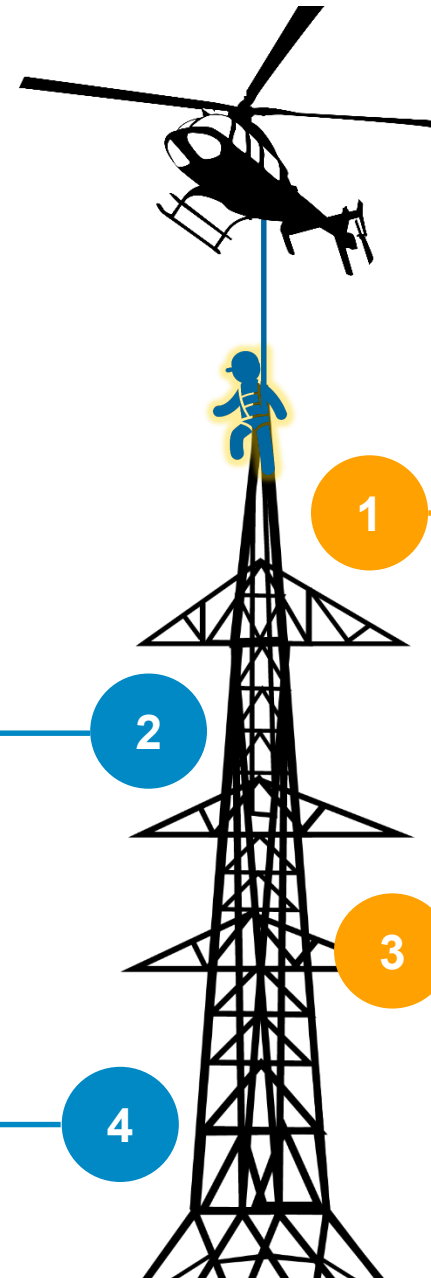
When the HEC employee is suspended from the helicopter HEC rope and is **clear of any obstructions**, the pilot will proceed to the location where the HEC employee is positioned.



The HEC employee should minimize the time that they are attached to both the helicopter and the structure.

When the HEC employee is on the structure, the employee must immediately attach either the fall-arrest lanyard or the positioning strap to the structure to maintain 100% fall protection.

Signal the pilot that it is safe to depart.



As the pilot moves the HEC into position, the HEC employee must signal the pilot to help position him or her into the proper location on the structure.

- Use human performance tools such as the two-minute rule to become aware of your surroundings and focus on safety.

After the HEC employee is attached to the structure, remove the HEC rope from the harness immediately.



# STEEL STRUCTURE EXTRACTION



When the HEC employee is ready to **leave a structure**:



Communicate the pick-up location with the pilot.



Assume a position on the structure that allows for easy access and avoids hazards.



Pilot must approach the structure slowly and position helicopter HEC rope so the HEC employee can easily reach and attach the lanyard to the harness.



HEC employee connects lanyards to harness proper D-ring, and immediately disconnects positioning strap or fall-arrest lanyards from structure.

# STEEL STRUCTURE EXTRACTION - CONT.

Once the HEC employee is **disconnected** from the structure:



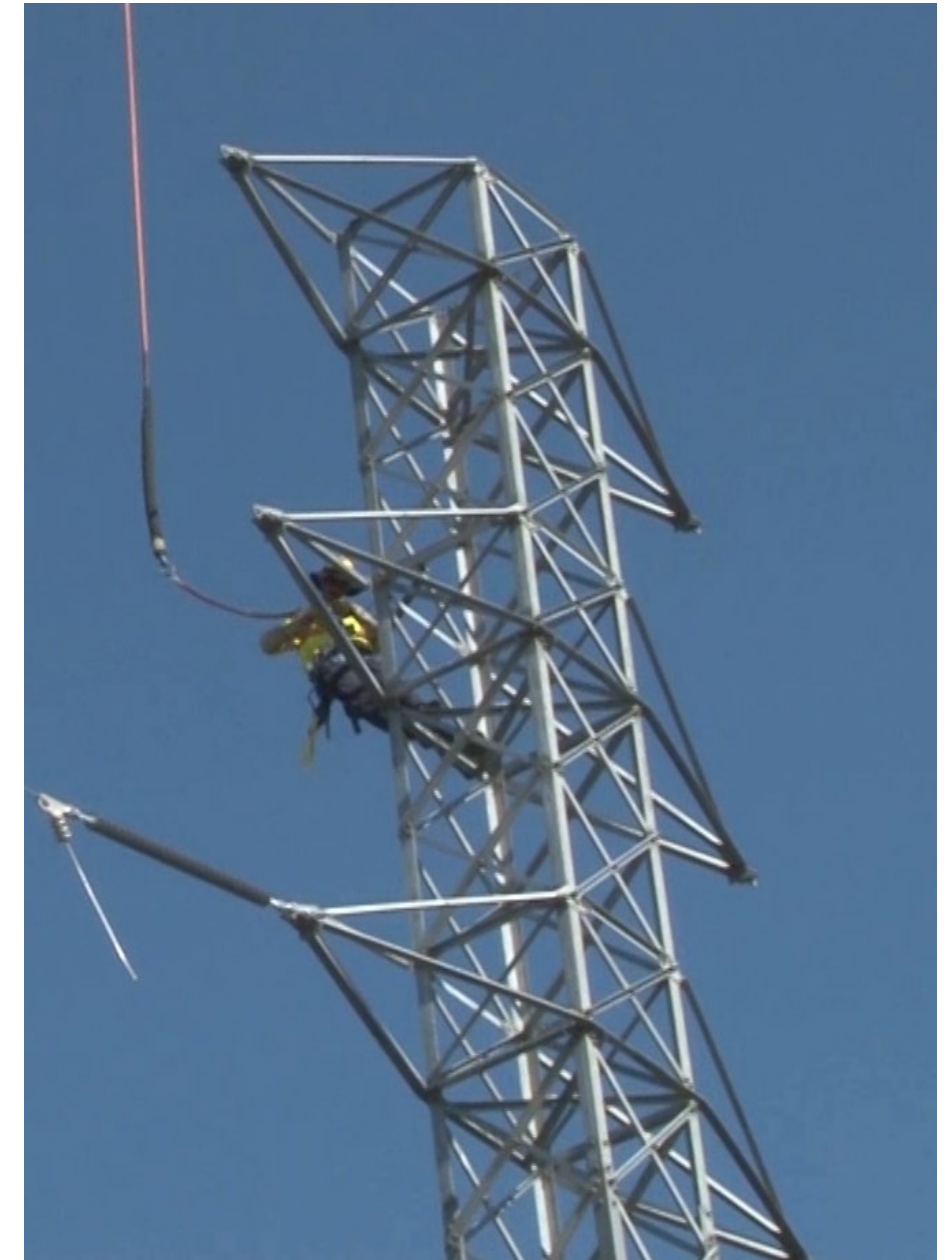
Signal the pilot that it is safe to lift off.

- The pilot and employee must ensure that nothing is hanging from the HEC employee's belt that could tangle on the structure as the helicopter moves away.



When two HEC employees are ready to leave the structure:

- The HEC employees connect their lanyards to the harness's proper D-ring, and immediately disconnects their positioning strap or fall-arrest lanyards from the structure before signaling the pilot that it is safe to lift off.



# STEEL STRUCTURE TRANSFER - VIDEO



# HUMAN EXTERNAL CARGO IN ACTION - VIDEO



# GROUND TO WOOD POLE TRANSFER - PREPARATION


Line workers must follow [Utility Procedure TD-2923P-01, Climbing Wood Poles](#), when involved in **HEC operations**. Prior to performing transfers:

 Inspect and test the wood poles before making the transfer to ensure that the pole will support the additional load of the worker.

- Wood poles must be inspected and tested, as described in *Code of Safe Practices* Rule 417, “Testing Poles and Stubs”.

 Ensure that the double-release system mounted on the helicopter is working properly and that all rigging components are in good condition.

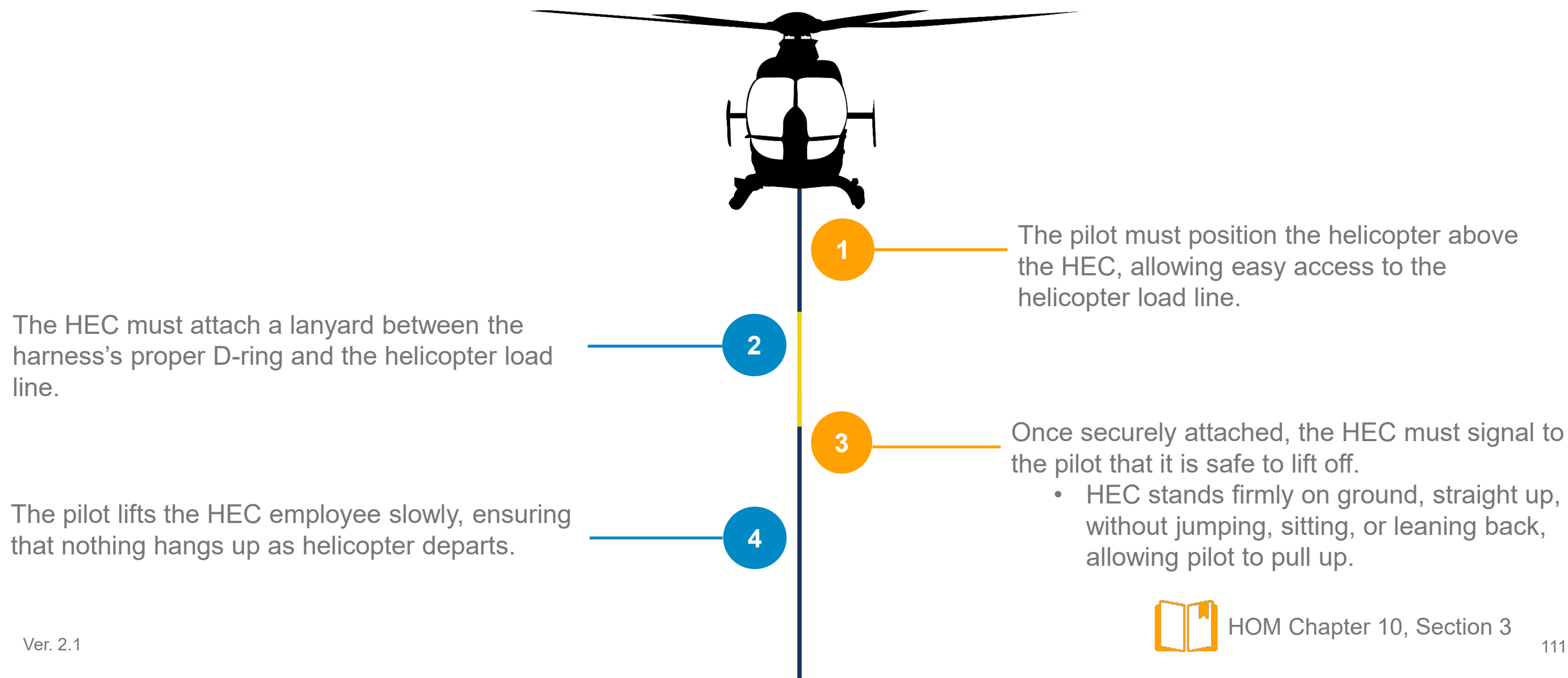
- Pilot and HEC must discuss any special conditions.

 The HEC must ensure that the pilot knows the exact pole number and the location on the pole where work is to be performed. Before beginning the transfer, the HEC and pilot must:

- Discuss and address all the special conditions, safe working distances, and hazards associated with the pole.
- Agree on the methods to implement when dealing with the specific job conditions.

# TAKEOFF PROCEDURE FOR GROUND TO WOOD POLE

When transferring workers to a **wood pole**, only **one worker** may be transferred at a time to prevent the workers from accidentally being insured by coworkers' gaffs.



# WOOD POLE LANDING



When the HEC employee is suspended from the helicopter load line and is **clear of any obstructions**, the pilot will proceed to the location where the HEC employee is positioned.

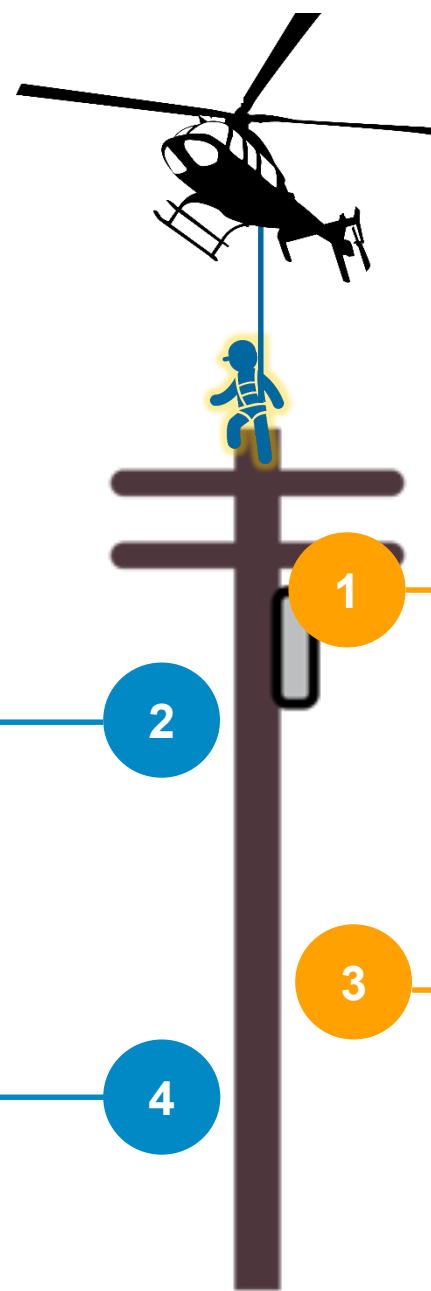


The HEC employee should minimize the time that they are attached to both the helicopter and the pole.

When the HEC employee is placed on the pole, the employee must immediately attach their fall restraint equipment (FRE) to the pole prior to disconnecting from the helicopter HEC lanyards.

When the load line is detached, the HEC signals the pilot that it is safe to depart.

Ver. 2.1



As the pilot moves the HEC into position, the HEC must signal the pilot to help position him or her into the proper location for the transfer.

- Use human performance tools such as the two-minute rule to become aware of your surroundings and focus on safety.

After the HEC employee is attached to the pole, remove the helicopter load line from the harness immediately.



# WOOD POLE TRANSFER – SPECIAL CONDITIONS



Follow all applicable “Fall Protection” rules & *Code of Safe Practices*, Rule 8, “Fall Protection”

- ☑ If pole type requires pilot to lower HEC between conductors, pilot must ensure worker is at a safe distance from pole before proceeding.
- ☑ HEC must not contact conductors and pole at the same time – without personal ground installed, this places the HEC in series with the conductor and the pole.
- ☑ After HEC is at a safe distance below conductors, pilot can maneuver HEC to pole for transfer.
- ☑ Pilot must position the HEC on pole so that the FRE strap will not slip over the top of the pole.

# WOOD POLE EXTRACTION



★ When the helicopter line-worker is ready to **leave a pole**:

- ☑ Communicate the pick-up location with the pilot.
- ☑ Assume a position on the pole that allows for easy access and avoids hazards.
- ☑ Pilot must approach the pole slowly and position helicopter load line so the line-worker can easily reach and attach the lanyard to the harness.
- ☑ The line-worker connects lanyard to harness's proper D-ring, and immediately disconnects the FRE strap from the pole.

# WOOD POLE EXTRACTION - CONT.

When the line-worker is **disconnected** from the pole:



Signal the pilot that it is safe to lift off.

- The pilot and employee must ensure that nothing is hanging from the line worker's belt that could tangle on the pole as the helicopter moves away.



The pilot always must move the helicopter away from the pole in a slow and cautious manner.

- If something does catch, the helicopter can be maneuvered back to the pole easily and the line-worker can free it from the pole.
- When the helicopter and suspended line-worker are clear of the pole and related conductors, the pilot must return to the landing zone or proceed to the next location.



# WOOD POLE TRANSFER - VIDEO



# KNOWLEDGE CHECK

Complete the questions and be prepared to share your answers with the class.

**1** Identify which step is NOT correct for performing a ground to ground HEC transfer.

- a) Pilot must position helicopter above HEC employee allowing access to helicopter load line.
- b) HEC employee must attach lanyards between harness's dorsal/back D-ring and helicopter load line.
- c) Signal to pilot that it is safe to lift off.
- d) After pilot receives signal, he/she will lift HEC employee slowly, ensuring nothing hangs up as helicopter departs.

**2** When landing an HEC employee on a steel structure, which step is NOT correct?

- a) HEC must signal the pilot to help position him or her into the proper location on the structure.
- b) Attach either fall arrest lanyard or positioning strap to structure immediately.
- c) After attached, remove HEC rope from harness immediately.
- d) Toss the HEC rope away from the structure one detached from harness, ensuring that it doesn't come back to hit the employee.

**3** Two workers can be transferred to a Wood Pole?

- a) True
- b) False

# KEY TAKEAWAYS

## You should now be able to:

- Demonstrate the proper takeoff procedures for HEC operations.
- Outline the key points for departure safety.
- Identify proper safety procedures and precautions for ground to ground, ground to steel, and ground to wood pole transfers.
- Demonstrate proper procedures to transfer from ground to ground, to or from a steel structure, and to and from a wood pole.
- Demonstrate extraction procedures to or from a steel structure, and wood pole.



# TEST



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# KNOWLEDGE ASSESSMENT

# PRACTICE

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## SKILL ASSESSMENT