GENERAL TECHNICAL ADMINISTRATION

CHAPTER 51 PART 133 EXTERNAL LOAD OPERATIONS

Section 6 Evaluate a Part 133 Congested Area Plan

3-4201 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODE. 1332.

3-4202 OBJECTIVE. Determine if a congested area plan (CAP) meets all regulatory and safety requirements. Successful completion of this task results in either approval or disapproval of a CAP.

3-4203 GENERAL.

A. Authority. Title 14 of the Code of Federal Regulations (14 CFR) part 133, § 133.33(d) permits an operator to conduct external-load operations over congested areas provided the operator does so without creating undue hazard to persons or property. Any rotorcraft used in congested areas requires type certification under 14 CFR part 27 or 29. Conduct each flight on a route and at an altitude that will allow release of a jettisonable load and safe landing of the helicopter if an emergency arises. Section 133.33(d)(1) requires the operator to develop a plan for each operation in a congested area. The Flight Standards District Office (FSDO) that has jurisdiction over the area of operation must approve the plan and coordinate as necessary with the certificate-holding district office (CHDO).

B. Background. The Federal Aviation Administration (FAA) has determined that external-load operations are in the public interest and do not inherently pose an undue risk to the public. Risk management (RM) procedures such as a CAP and frequent surveillance help prevent hazards. Section 133.33(d)(1) describes the information that must be included in a CAP.

C. Definitions. For the purpose of operations conducted under part 133, the following definitions apply:

1) Appropriate Political Subdivision. Describes local officials who may exercise the authority to exclude persons and property from an area. These officials include the county sheriff, city police department, highway patrol, fire department, or security guards acting for the political subdivision. In many cases, local police will monitor an external-load operation but will require the operator to supply sufficient personnel to exclude persons and property from the lift area.

2) Congested Area Plan (CAP). An RM document used to show that the risk associated with an external-load operation will not create undue hazards to property and the nonparticipating public because of certain, specific procedures used by the operator during the operation.

3) Congested Areas versus Densely Populated Areas. These two terms are used in reference to rotorcraft external-load operations. Although the terms describe similar areas, the meanings are different. The regulations require preparation of a CAP for congested areas. A CAP

is also needed for densely populated areas. In addition, an uncongested, sparsely populated area may need a CAP because the area may quickly become congested with persons watching an external-load operation.

a) Congested Area. The congested nature of an area is defined by what exists on the surface, not the size of the area. While the presence of the nonparticipating public is the most important determination of "congested," the area may also be congested with structures or objects. An area considered congested for airplane operations could be equally congested for helicopters. If an airplane flying over a congested area at less than 1,000 feet above ground level (AGL) is in violation of 14 CFR part 91, § 91.119(b), the area may also be a congested area for a helicopter conducting external-load operations. However, the most important word in this concept is "over." Helicopters can operate over relatively small uncongested areas because of their maneuvering abilities.

b) Densely Populated Area. Sections 91.313 and 133.45(d) use the term "densely populated" area. Those areas of a city, town, or settlement that contain a large number of occupied homes, factories, stores, schools, and other structures are considered densely populated. Additionally, a densely populated area may not contain any buildings but could consist of a large gathering of persons on a beach, at an airshow, at a ball game, or at a fairground.

NOTE: While the presence of the nonparticipating public is the most important determination of congested, this definition also applies to structures, buildings and personal property. The congested nature of an area is defined by what exists on the surface, not the size of the area.

4) Contractor. The person, corporation, or entity who hired an operator to conduct the external-load operation.

5) Emergency Landing Site. Section 133.33(d)(2) requires the rotorcraft to be at an altitude that allows landing in an emergency without hazard to persons or property on the surface. There is no requirement that the emergency landing occur without damage to the rotorcraft. An emergency landing site does not have to be an improved surface. Examples of emergency landing sites are the parking lot at the pickup site and a rooftop at the set site.

6) Operational Area. An area unoccupied on the surface by the nonparticipating public. The operational area is not part of the operation, but persons within this area could sustain injuries, or property could sustain damage, by the external load or by the attaching means (load, cables, hooks, etc.).

7) Special Congested Area Plan (SCAP). A CAP to facilitate support of local or national emergency prevention plans. The intent of these plans is to ensure timely equipment delivery to sites thereby preventing uncontrolled events. An example would be CAPs submitted by operators supporting contractors in the nuclear power industry's Strategic Alliance for FLEX Emergency Response (SAFER) team.

8) Without Hazard. This means to operate without undue hazard beyond the risk posed by other rotorcraft operations to nonparticipating public or property. Protect the nonparticipating public from all the potential hazards associated with external-load operations.

Protect property as much as possible. Potential hazard to property alone should not preclude conducting an external-load operation in accordance with a CAP.

D. Restricted Category Rotorcraft. Part 133 provides that a rotorcraft external-load operator may conduct operations over congested areas only in a rotorcraft type-certificated (TC) under and meeting the requirements of parts 27 and 29 (normal and transport category rotorcraft).

1) Restricted category rotorcraft certificated in accordance with 14 CFR part 21 do not necessarily meet airworthiness requirements for parts 27 and 29. Therefore, in order to maintain an equivalent level of safety, operators must not use restricted category rotorcraft in the following external-load operations:

a) Over a densely populated area.

b) In congested airways or near a busy airport conducting passenger transport operations. An external-load operator using restricted category rotorcraft near a busy airport must show that adequate procedures exist to ensure that no external-load operation occurs when passenger transport operations are in progress. (An external-load operation conducted within Class D airspace could be considered near a busy airport under § 133.45(d).) Advise the operator that advance coordination is required with the air traffic control (ATC) facility that has jurisdiction over the airport.

2) Section 91.313(e) prohibits any operation of aircraft certificated under part 21, § 21.25 from operating over densely populated areas, on a congested airway, or near airports conducting passenger transport operations. The Administrator may issue operating limitations to permit such operations or the geographically responsible FSDO may issue a waiver to the rule in accordance with § 91.905. Section 91.313(e) does not apply to operations conducted under part 133 (refer to § 133.45(d)); however, it may apply to ferry or repositioning flights performed by part 133 operators.

3) If there is verification that the external-load lift site is an uncongested area, or can become an uncongested area, a restricted category helicopter may conduct an external-load operation. However, a contingency plan (not a CAP) may be necessary to determine that the operator has considered areas for load jettisoning, emergency landings, ingress and egress routes, and means for maintaining a sterile area. This last item is most important since the mere presence of a helicopter conducting an external-load operation is likely to draw spectators and other unnecessary personnel to the scene, to the extent that the area may become congested.

E. Evaluation of the CAP. The FSDO that has jurisdiction over the area of operation must approve the certificate holder's plan for each operation. Notify and coordinate with the CHDO for the operator as necessary when approving a new CAP. A separate plan is not necessary for each flight. One plan may suffice for an operation that requires several flights or even days to complete, as long as the operation area does not change. Plans vary widely and the inspector must consider all situations that may arise.

F. Qualifications of the Inspector Evaluating the Plan. Whenever possible, an inspector with experience as an external-load helicopter pilot should review CAPs. If a FSDO

does not have an inspector with this experience, the office manager will designate the best-qualified Operations inspector.

G. The Concept of RM in External-Load Operations. It is unreasonable to expect the plan or the inspector to foresee every unlikely eventuality, including crash forces or scatter patterns. A helicopter crash that occurs during a low speed, low altitude external-load operation may produce less crash force than another helicopter without an external-load that hits with 120 knots forward speed. Consequently, both the operator and the inspector must weigh all the alternatives and carefully make decisions that would not unduly restrict external-load operations that are clearly in the public interest. The operator is responsible for developing a plan that minimizes manageable risk.

1) Use rotorcraft identification to verify that a particular helicopter is on the list of authorized rotorcraft (operations specification (OpSpec) A003).

2) Use identification of rotorcraft airworthiness category to determine whether the operator plans to use restricted category helicopters. Determine if the area of the proposed operation is a congested area. (See subparagraph 3-4203C3)a).)

3) Include the dates and times of the proposed operation. This enables the inspector to evaluate the exclusion of unauthorized persons from the operational area by local authorities or the operator. It also provides the inspector with the opportunity to schedule surveillance during the operation. If the plan is a SCAP, the operator may submit the dates and times as “to be determined (TBD)” due to the inability to predict the date and time of a potential event. The SCAP approval letter must specify that the approval is for 12 months and the operator must review and validate the SCAP every 12 months. The operator should submit the annual renewal request (with changes if needed) at least 30 days prior to the SCAP expiration date. All efforts should be made to ensure that the revalidated SCAP is approved prior to the expiration date.

4) Obtain the name, phone number, and title of the official of the local political subdivision, when appropriate.

5) When evaluating the plan, consider the weight, shape, and aerodynamic flight characteristics of the load.

6) Obtain the proposed length of cable to determine if the plan provides for an adequate operational area.

7) The operator should estimate how many floors the load, with attaching means, could penetrate if dropped from the highest point lifted above the building. Take into account the type of roof construction and the size, shape, and weight of the load. The plan should require that one additional floor beyond those estimated to be penetrable be unoccupied. On a tiered building, the height of load lift above each tier determines the number of floors in the respective tiers that must be unoccupied (see Figure 3-135, Height of Load Above Building).

8) The inspector should obtain phone numbers to contact the building owner and/or manager for verification that the building will actually be unoccupied during the operation. This includes after-hours personnel such as building maintenance workers.

9) Aeronautical charts alone often do not provide sufficient detail for depicting routes and altitudes over a congested area. City maps or even hand-drawn charts may be necessary. Draw charts to approximate scale. Topographical maps, charts, and aerial photographs should be as current as possible to assure an accurate representation of the area.

10) When available, photographs of the lift site, set site, and surrounding areas can also be an asset to the inspector. If the CAP is in an area unfamiliar to the inspector, the addition of these photographs can greatly reduce the amount of time needed to approve the CAP.

NOTE: Each external-load operation is unique. The risk to the nonparticipating public dictates operational area requirements. Emphasize that the following criteria are guidelines and the inspector may exceed or reduce them as appropriate.

H. Method 1: Normal Loads. For non-aerodynamic loads, such as air conditioning units and flagpoles flown below effective translational lift (ETL), the radius of the operational area should be at least 1.5 times the overall length (including rotor discs) of the helicopter used, or the length of the external-load including the attaching means (e.g., cable), whichever is greater (see Figure 3-136, Non-Aerodynamic Load Operational Area—Forward Distance Below Effective Translational Lift). When operating along a route above ETL, the operational area should extend at least 45 degrees in front of the rotorcraft. For example, if the rotorcraft (not load) operates at 300 feet above the surface, the operational area should extend at least 300 feet in front of the rotorcraft. The forward radius should extend at least three times the overall length of the helicopter (see Figure 3-137, Non-Aerodynamic Load Operational Area—Forward Distance Above Effective Translational Lift).

I. Method 2: Aerodynamically Shaped Loads. For aerodynamic loads, use whichever is greater: Method 1 or Method 2. In Method 2, the criterion applied to aerodynamic loads provides for about 45 degrees of drift after load release. For a load lifted 200 feet high, the operational area radius should be 200 feet. Use the method of calculation that provides for the greatest operational area. For example, a helicopter that transports an aerodynamically shaped load along a congested area route will require a wider operational area the higher above the surface the load is lifted. Conversely, operating the rotorcraft at a higher altitude provides more options for landing in an emergency. Generally, the plan should provide for operating the rotorcraft at an altitude high enough to permit landing in an emergency, but hold the load low enough to ensure that the external load will land within the operational area if released (see Figure 3-138, Aerodynamic Load Operational Area—Radius and Forward Distance Computation Above Effective Translational Lift).

J. Conditions of Approval. You may find it necessary to specify conditions of approval for a plan. You may base these contingencies on your experience monitoring similar plans or experience with this operator. You may approve the plan in principle, provided the operator complies with the written contingencies noted on the plan. For a SCAP, a condition for approval will require the operator to notify the FSDO and CHDO of the dates and times of the lift, as well as providing an updated pilot and aircraft list to be used (if different from the original SCAP submitted).

K. Coordination with Appropriate Officials. Local officials should exclude unauthorized persons from the site if open to the public. In some cases, local officials may delegate this task to the operator, who is ultimately responsible for site security.

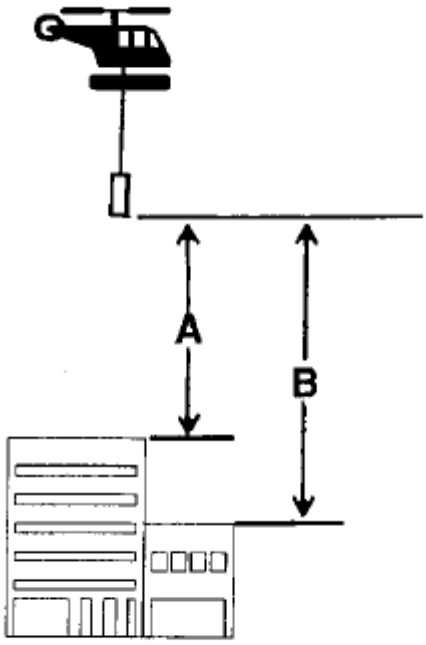
L. Subcontracting Work or Equipment: Responsibility for the CAP. A situation may arise when an external-load operator contracts with another external-load operator for a specific operation. For example, operator A's helicopter can lift only a certain weight that is less than the weight of the load to be lifted. Operator B has a large helicopter that can lift the load. In this case, operator B would have to submit the CAP because operator B is actually performing the work. If operator A wishes to conduct the external-load operation using operator B's helicopter, operator A must meet all certification requirements appropriate to adding operator B's helicopter to operator A's list of authorized rotorcraft.

M. Site Inspection. Unless the inspector has a current working knowledge of the site/route, or the operator can supply photographs of sufficient detail, make an onsite survey.

N. CAP Alternatives. The CAP submitted by the operator should contain alternative plans for as many variables as possible. With approved alternatives, the operator may not need to postpone the operation to seek FAA approval if the plan needs modification. If the plan is a SCAP, the operator should submit details as though the lift were being conducted with known dates.

3-4204 MONITORING A CAP. Monitor each CAP operation if practicable. However, an ongoing daily operation may not require continuous monitoring. An operator unfamiliar to the FSDO or an operator working over a congested area for the first time should require an inspector's presence for the duration of the operation. If the inspector observes an imminent violation, the inspector should attempt to advise the operator to cease operations until he or she can correct the situation (see Volume 6, Chapter 5, Section 3).

Figure 3-135. Height of Load Above Building



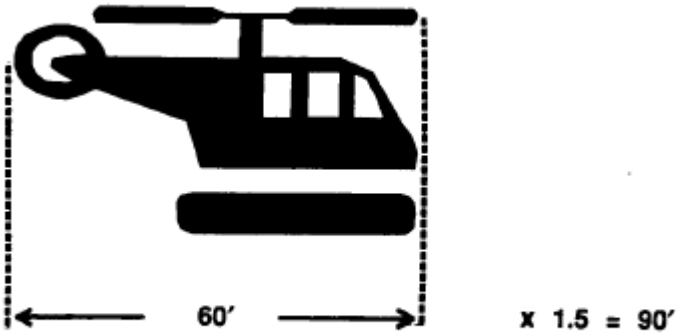
A = The maximum height that the load will be lifted above the top of the building must be specified in the plan if the building will be occupied during the operation.

B = The maximum height that the load will be lifted above the lower tier (if applicable) must also be specified if this portion of the building will be occupied during the operation.

Figure 3-136. Non-Aerodynamic Load Operational Area—Forward Distance Below Effective Translational Lift

RADIUS

Use the greater of: a) 1.5 times the overall length of helicopter



b) Overall length of load (including cable)

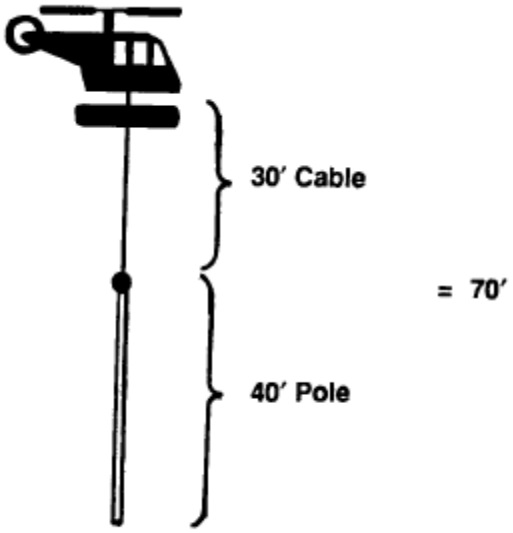
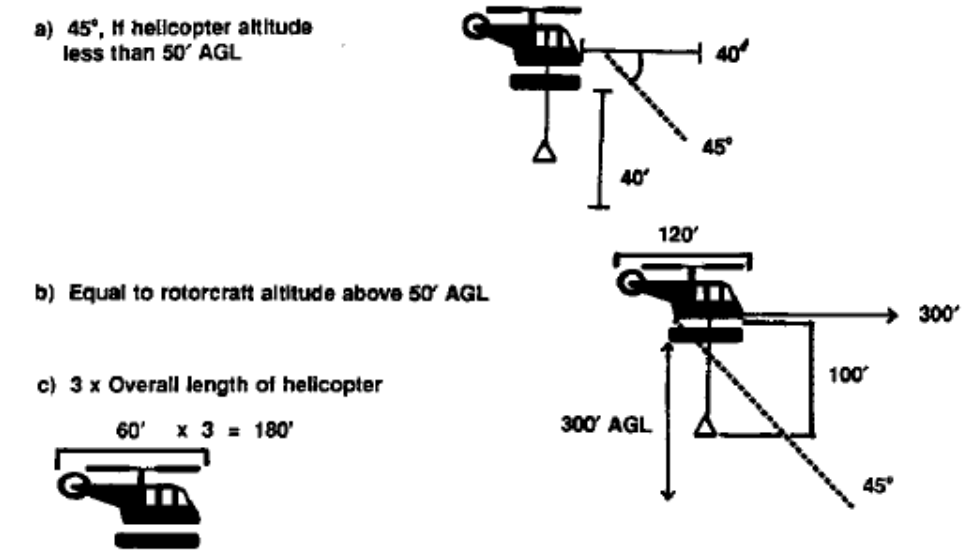


Figure 3-137. Non-Aerodynamic Load Operational Area—Forward Distance Above Effective Translational Lift

Minimum of: (But not less than 3 times overall length)



Operational Area for the above example would equal 300′ forward distance and would be depicted as:

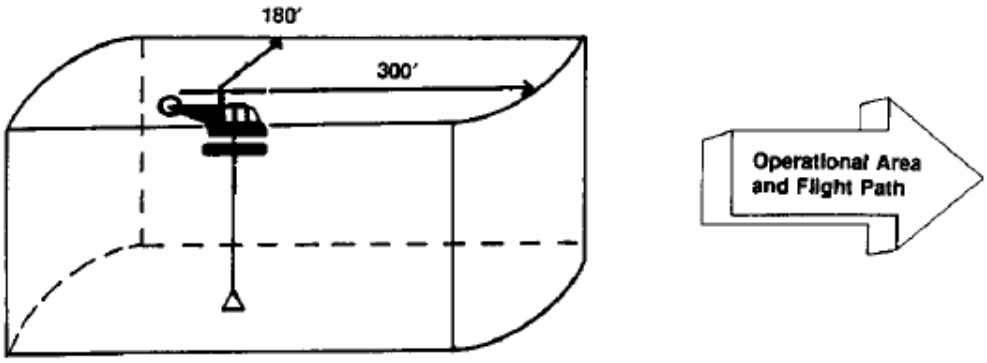


Figure 3-138. Aerodynamic Load Operational Area—Radius and Forward Distance Computation Above Effective Translational Lift

Use the greater of:

1) Non-aerodynamic load criterion,

OR

2) Altitude above ground level (AGL) of aerodynamic external-load.

Using the same method from the non-aerodynamic load example in Figure 3-137 and adding the following aerodynamic load, the operational area becomes:

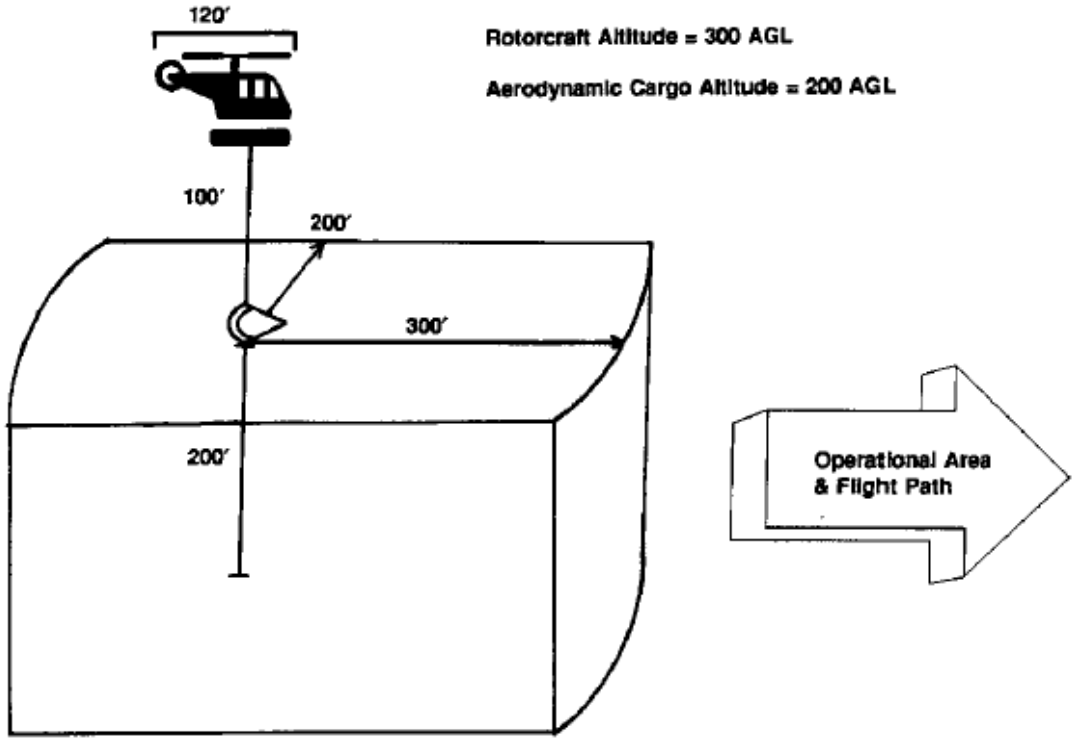
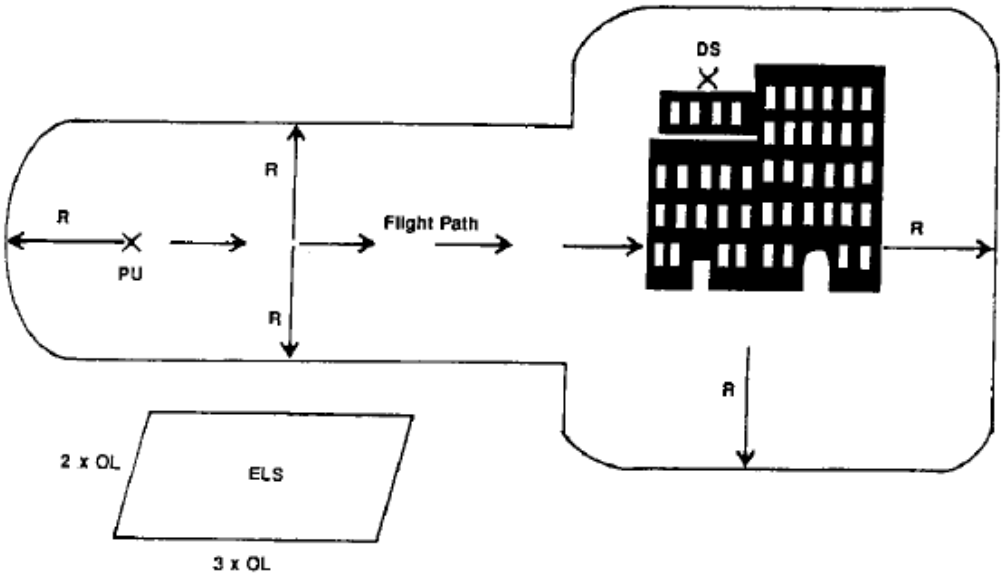


Figure 3-139. Operational Area Around Building and Emergency Landing Site

R = 1.5 times the overall length (OL) of helicopter, including rotor blades

PU = pickup site

DS = delivery site



3-4205 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. This task requires knowledge of the regulatory requirements of part 133 and FAA policies, and qualification as an aviation safety inspector (ASI) (Operations) with experience as an external-load helicopter pilot.

B. Coordination. This task requires coordination with the local officials and possibly with the operator's CHDO.

3-4206 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 1, 21, 27, 29, 61, 91, and 133.
- Advisory Circular (AC) 133-1, Rotorcraft External-Load Operations in Accordance with Federal Aviation Regulations Part 133.
- PTRS Procedures Manual (PPM).

B. Forms. None.

C. Job Aids:

- Sample CAP.
- Tape recorder and camera equipment.
- Sample letters and figures.

3-4207 PROCEDURES.

A. Initial Inquiry. Upon inquiry, give the applicant a sample CAP or explain what the plan must include. For a SCAP, explain that the operator should submit details as though the lift were being conducted with known dates.

B. PTRS. Open the PTRS record.

C. Review Submitted Plan. An acceptable plan must include (but not be limited to) the following information:

1) The name, address, and phone number of operator;

2) The name, address, and phone number of contractor;

3) The identification number of rotorcraft (N-number);

4) The type of rotorcraft (make and model) to be used and the rotorcraft airworthiness category (standard or restricted);

5) The names of pilots involved in the congested area operation;

6) The number of loads to be carried;

7) A description of loads to be carried including the weight of each load;

8) The date the operation begins, the dates of all flights, and the date the operation ends;

9) The name and phone number of the person contacted at the police, sheriff, and/or fire departments;

10) The signature of person responsible for the company (usually the chief pilot);

11) The date of submission;

12) A copy of the written agreement with local officials for the exclusion of unauthorized persons, or the name and telephone number of the official if responsibility is delegated to the operator;

13) A record of coordination with ATC (if applicable);

14) A detailed chart depicting flight routes and altitudes;

15) A diagram and narrative defining operational areas, pickup sites, delivery site, streets to be blocked and to be unoccupied by persons, and location of obstructions in the operating area;

16) A procedure for ceasing operation if a potential or real hazard occurs;

17) A list of all buildings to be unoccupied by persons during the lift;

18) A list of buildings within the operational area that will be occupied by persons, as well as number of floors that may be occupied;

19) An estimate of how many floors of the building would be penetrated if the load is released at the maximum height it will be lifted above the roof, if appropriate. The plan should provide the inspector with assurance that the load will penetrate no more than the number of floors specified in the plan;

20) An estimate of how long the external-load attaching means will be, such as the length of the cable; and

21) The designation of emergency landing areas at the delivery and pickup sites.

D. Verify Plan. Ensure that the operator has checked with the local political subdivisions to verify that they agreed to provide security for the area and that they thoroughly understand the nature and implications of the plan.

E. Review Files. Review office files or coordinate with the CHDO in order to review the current operating certificate to determine the class of authorization.

F. Site Inspection.

1) Verify that the operational areas, including emergency landing sites, are adequate as described in the plan.

2) Travel the actual route to verify safe load jettison and rotorcraft landing in an emergency.

3) Note any discrepancies or conditions of approval.

G. Plan Satisfactory. When the operator meets all requirements for the plan, approve it by stamping, dating, and signing each page. Make a copy of the plan for the FSDO files.

H. Plan Satisfactory with the Addition of Provisions. When the operator meets all requirements, but safety demands further requirements, approve the plan with provisions specified in writing (Figure 3-140, Letter Approving Congested Area Plan with Provisions). Make a copy of the plan and the provisions for the file.

I. Plan Unsatisfactory. Advise the operator that the plan is unsatisfactory and explain what the deficient areas are.

1) Discuss whether to return the plan or whether the operator will amend the plan.

2) Review resubmitted plan and reinspect the site as necessary.

J. PTRS. Close the PTRS record.

3-4208 TASK OUTCOMES. Completion of this task results in either:

- A record in the file indicating an approved CAP, with or without provisions; or
- A letter to the operator outlining areas of deficiency in a CAP.

3-4209 FUTURE ACTIVITIES. Monitor the congested area operation to ensure compliance with the approved plan.

Figure 3-140. Letter Approving Congested Area Plan with Provisions

FAA Letterhead

[Date]

[Name and address of the operator]

Dear [Name of the operator]:

We confirm the approval of the Congested Area Plan (CAP) submitted by you on [date].

This approval concerns the proposed operation at [site location] on [date(s)], and is contingent on [cite contingencies as appropriate]. Inspectors from this office will monitor the operation to ensure compliance with the approved plan.

Should you have any questions or need to submit a change to this plan, please contact this office at [FSDO, telephone number].

Sincerely,

[Principal operations inspector's (POI) signature]

Figure 3-140A. Letter Approving a Special Congested Area Plan with Provisions

FAA Letterhead

[Date]

[Name and address of the operator]

Dear [Name of the operator]:

We confirm the approval of the Special Congested Area Plan (SCAP) submitted by you for the [name of power station or lift location].

This approval concerns the proposed operation, as described in your plan, of a 14 CFR part 133 External Load Operation to transport equipment from the [pickup location] to the [delivery location]. Compliance with the enclosed approved SCAP and the following provisions apply: (*include at least the following provisions*)

1) This SCAP is effective for 12 calendar-months from the date of this letter.

2) [Name of the operator] must review this SCAP every 12 calendar-months and submit a written update or revalidation to this FSDO (courtesy copy to the CHDO).

3) Prior to the start of operations in accordance with this SCAP [Name of the operator] must notify this FSDO (courtesy copy to the CHDO) of the dates and times of the lift as well as provide an updated pilot and aircraft list to be used (if different form the original SCAP submitted).

4) This approval does not authorize operations within any Special Use Airspace (e.g., prohibited or restricted) nor does it waive any regulations.

Should you have any questions or need to submit a change to this plan, please contact this office at [FSDO telephone number].

Sincerely,

[Principal operations inspector's (POI) signature]

RESERVED. Paragraphs 3-4210 through 3-4211.