

**Requirement for the operations
of Hospital Helipads**

Civil Aviation Authority of Nepal

Civil Aviation Safety Regulation Directorate

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Requirement for the operations of Hospital Helipads

Foreword

The road traffic situation in the major cities of the country is being difficult day by day creating lots of delay. The impact of delays in medical evacuation process is highly critical especially for the evacuation of critical medical patients. Taking into consideration of this fact, the demand for hospital helipad in the major cities has now been increasing. However, there were no regulatory provisions in the prevailing requirements to address the issue for operation of hospital helipads, especially the elevated helipads. Because of this reason, it lacked uniformity in the past in approval process of the hospital helipad, and this is the main background for the evolution of the concept of this Requirement.

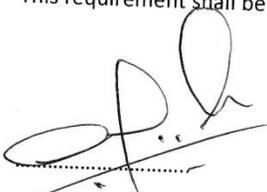
Section 35 of Civil Aviation Authority of Nepal (CAAN) Act 2058 authorizes CAAN to frame and enforce guidelines in order to implement the rules and standards set up by the international organizations, and it shall be the duty of all concerned to comply with such a guidelines. Similarly, Rule 82 of Civil Aviation Regulation 2058 authorizes CAAN to develop and implement the requirements without contradicting the prevailing CAAN Civil Aviation Act 2053 and other national legislative provisions for implementation of the rule, annex, manual and standards prescribed by the International Civil Aviation Organizations in relation to safe and reliable air services operations.

Hence, in the above respect, CAAN has developed this requirement, " **Requirement for the operations of Hospital Helipads** " under the above mentioned provisions of CAAN Act 2053 and CAAN Civil Aviation Regulation 2058, and this requirement will be applied to all concerned involved directly or indirectly in the construction, operations and maintenance of such helipads and helicopter operations therefrom.

This is a controlled document and is subject to periodic review. Civil Aviation Safety Regulation Directorate will maintain this document as complete, accurate and up-dated as possible. Comments and recommendations for revision/amendment action to this publication shall be forwarded to the Deputy Director General of Civil Aviation Safety Regulation Directorate. However, concerned safety departments under the Civil Aviation Safety Regulation Directorate will be responsible to oversight and regulate the Hospital helipad operations activities.

This Requirement will be superseded by the any other pertinent Civil Aviation Requirement (CAR) issued by the CAAN or editions thereto.

This requirement shall be enforced with immediate effect.



(Director General)

Civil Aviation authority of Nepal

Requirements for the operations of Hospital Helipads

Amendments

Amendments and Corrigenda to this "Requirements for the operations of Hospital Helipad" is regularly issued by Director General of CAA, Nepal. The space below is provided to keep a record of such amendments.

| AMENDMENT | | | |
|-----------|-----------------|--------------|------------|
| No. | DATE APPLICABLE | DATE ENTERED | ENTERED BY |
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| CORRIGENDA | | | |
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1. Purpose:

This Requirements for the Operations of Hospital Helipads is issued to set out the minimum requirements for the helicopter pilots, helicopter operators and the hospital helipad operators for the safe operations of helicopters to and from hospital helipads (surface level and elevated) and for the safe operations of hospital helipads as well. The Requirements provides appropriate guidelines to the CAA officials for the uniformity in the approval procedure of the hospital helipads and the helicopter operations thereto. It also provides operators with the detailed information that may be used to develop the standard operating procedures (SOP) on the part of both helicopter operators and hospital helipad operators.

2. Applicability:

This Requirement is applicable to the following agencies and individuals:

- Management of Helicopter Operator
- Management of Hospital Helipad Operator
- Flight crew operating flights to and from hospital helipad
- Responsible hospital unit for the safe and secure helipad operations
- Any other agencies or individuals to whom the directive is directly or indirectly applicable

3. Definitions

3.1 Final Approach and Take-Off Area (FATO)

A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced.

3.2 Touch Down and Lift-Off area (TLOF)

An area on which a helicopter may touch down or lift off.

3.3 Overall dimension of a helicopter (D)

The largest overall dimension of the helicopter when rotor(s) are turning measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane or helicopter structure.

3.4 Maximum Take-Off Mass (MTOM)

The maximum takeoff mass (MTOM) of an aircraft is a value defined by the aircraft manufacturer. It is the maximum mass at which the aircraft is certified for take-off due to structural or other limits. It is usually specified in units of kilograms or pounds. The mass is a fixed value and does not vary with changes in temperature, altitude or runway available.

3.5 Dynamic Load-bearing Surface

A surface capable of supporting the loads generated by a helicopter conducting an emergency touchdown on it.

3.6 Static Load-bearing Surface

A surface capable of supporting the mass of a helicopter situated upon it.

3.7 Safety Area

A defined area on a heliport surrounding the FATO which is free of obstacles, other than those required for air navigation purposes, and intended to reduce the risk of damage to helicopters accidentally diverging from the FATO.

3.8 Translational Lift

Improved rotor efficiency resulting from directional flight is called translational lift. The efficiency of the hovering rotor system is greatly improved with each knot of incoming wind gained by horizontal movement of the aircraft or surface wind.

3.9 Effective Translational Lift (ETL)

Translational lift achieved during transitioning to forward flight at about 16 to 24 knots at which the rotor system of helicopter operates more efficiently.

3.10 Go-around procedure

A go-around is an aborted landing of an aircraft that is on final approach. It is a procedure that is to be adopted, when, for any reason, it is judged by the flight crew that an approach cannot be continued to a successful landing.

3.11 Ground effect (GE)

A usually beneficial influence on helicopter performance that occurs while flying close to the ground. It results from a reduction in up-wash, downwash, and blade-tip vortices, which provide a corresponding decrease in induced drag.

3.12 In ground effect (IGE) hover

Hovering close to the surface (usually less than one rotor diameter distance above the surface) under the influence of ground effect.

3.13 Induced drag

That part of the total drag that is created by the production of lift.

3.14 Out of Ground Effect (OGE) Hover

Hovering a distance greater than one disk diameter above the surface. Because induced drag is greater while hovering out of ground effect, it takes more power to achieve a hover out of ground effect.

3.15 H1 category Helipad Firefighting Service

Category of Firefighting Service at the helipad serving helicopters having overall length less than 15 m.

3.16 Personnel Protective Equipment (PPE)

Personal Protective Equipment for fire fighters refers to the equipment worn to minimize exposure to serious workplace injuries and illnesses, such as protective helmets, masks, boots, goggles and other garment.

4. Requirements

This Requirement from 4.1 to 4.7 sets out the requirements for the design, construction, maintenance and operation of hospital helipads as well as the operation of helicopters to and from such helipads. The requirements for other associated services and procedures are also included in this directive.

4.1 Administrative and Organizational Issues at the Hospital Helipad

4.1.1 Hospital organization and helipad operations

Hospital Management shall establish helipad operations unit in organization structure that should clearly indicate the position of unit responsible for operation and maintenance of the helipad.

Requirements for the operations of Hospital Helipads

Roles and responsibilities of staff concerning with helipad operations

Roles and responsibilities of the staff working in the helipad operations unit shall be clearly mentioned in the Hospital Helipad SOP.

4.1.2 MOU with helicopter operators

Helipad operator shall have MOU with the helicopter operator which should clearly indicate the roles, responsibilities and liabilities of each agency, including the coordination procedure.

4.1.3 Helipad operators shall submit application to CAAN along with the No Objection Clearance (NOC) from the local authorities, especially the Municipal authority and the security authority for the approval of the helipad operations.

4.1.4 Helipad operators shall clearly indicate in the application that the responsibility of security and safety of helipad is the responsibility of the helipad operators. Any third party liability incurred due to the accident or incident of the helicopter at the hospital helipad is the responsibility of the hospital helipad operator.

4.2 Design and Construction of Hospital Helipad

4.2.1 Minimum dimension of helipad

a. Surface level helipad

i. Final Approach and Take-Off Area (FATO)

- The surface level helipad shall have a FATO whose dimension shall not be less than the 0.83 times the overall dimension (D) of largest helicopter that the FATO is serving, in case the MTOM of helicopter is 3175kg or less. Otherwise, the dimension shall not be less than the 1D.
- The FATO shall be obstacle free.
- Slopes of a FATO at an elevated heliport shall be sufficient to prevent accumulation of water on the surface of the area, but shall not exceed 2 per cent in any direction.
- The FATO shall be dynamic load-bearing surface.
- The FATO should provide ground effect.

ii. Touch down and Lift Off Area (TLOF)

- TLOF shall be provided at a helipad within FATO.
- The dimension of TLOF shall not be less than 0.83D.
- Slopes on a TLOF shall be sufficient to prevent accumulation of water on the surface of the area, but shall not exceed 2 per cent in any direction.
- TLOF shall be dynamic load-bearing surface.
- Where a FATO having dimension more than the 1D, the centre of the TLOF shall be located not less than 0.5 D from the edge of the FATO.

iii. Safety Area

- A surface level FATO shall be surrounded by a safety area which can be either solid or not.
- A safety area surrounding a FATO shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25D, whichever is greater and external dimension of safety area shall be at least 2 D whether the FATO is quadrilateral or circular. (See Figure 1)
- There shall be a protected side slope rising at 45° from the edge of the safety area to a distance of 10 m, whose surface shall not be penetrated by obstacles, except that when obstacles are located to one side of the FATO only, they may be permitted to penetrate the side slope surface.

Requirements for the operations of Hospital Helipads

- No fixed object shall be permitted above the plane of the FATO on a safety area, except for frangible objects, which, because of their function, must be located on the area. No mobile object shall be permitted on a safety area during helicopter operations.
- Objects whose function requires them to be located on the safety area shall not:
 - if located at a distance of less than $0.75D$ from the centre of the FATO, penetrate a plane at a height of 5 cm above the plane of the FATO; and
 - if located at a distance of $0.75D$ or more from the centre of the FATO, penetrate a plane originating at a height of 25 cm above the plane of the FATO and sloping upwards and outwards at a gradient of 5%.
- The surface of the safety area, when solid, shall not exceed an upward slope of 4% outwards from the edge of the FATO.
- Where applicable, the surface of the safety area shall be treated to prevent flying debris caused by rotor downwash.
- When solid, the surface of the safety area abutting the FATO shall be continuous with the FATO.

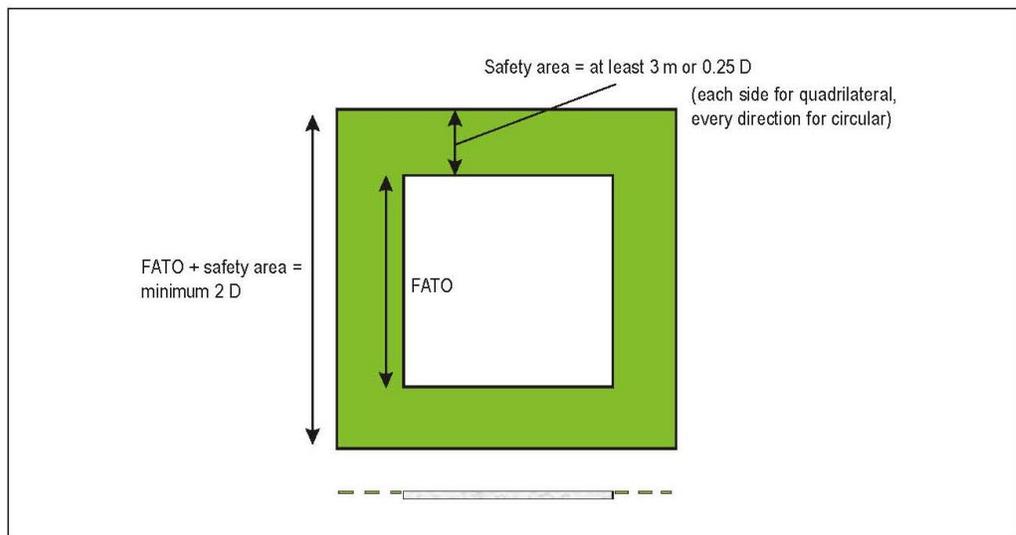


Figure 1. FATO and associated safety area

b. Elevated Helipad

- i. Helicopters having Maximum Take-Off Mass (MTOM) 3175 kg or less are only allowed to operate on elevated hospital helipad.
- ii. FATO and TLOF
 - FATO and TLOF shall be coincidental in elevated helipad.
 - The dimension shall not be less than the $0.83D$ (for MTOM of helicopter is 3175kg or less).
 - The FATO/TLOF shall be obstacle free.
 - Slopes of a FATO/TLOF at an elevated heliport shall be sufficient to prevent accumulation of water on the surface of the area, but shall not exceed 2 per cent in any direction.
 - The FATO/TLOF shall be dynamic load-bearing surface.
 - The FATO should provide ground effect.

Note 1: Helipads (surface level or elevated) permitted after the promulgation of this directive in no case shall have FATO/TLOF with dimension less than 40ftx40ft or diameter 40ft.

Note 2: Local conditions, such as elevation and temperature, may need to be considered when determining the size of a FATO.

iii. Safety Area

- The FATO shall be surrounded by a safety area which need not be solid.
- A safety area surrounding a FATO intended to be used in visual meteorological conditions (VMC) shall extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.5D, whichever is the greater and external dimension of the safety area shall be at least 2D. (See Figure 1)
- There shall be a protected side slope rising at 45° from the edge of the safety area to a distance of 10 m, whose surface shall not be penetrated by obstacles, except that when obstacles are located to one side of the FATO only, they may be permitted to penetrate the side slope surface.
- No fixed object shall be permitted on a safety area, except for frangible objects, which, because of their function, must be located on the area. No mobile object shall be permitted on a safety area during helicopter operations.
- Objects whose function require them to be located on the safety area shall not exceed a height of 25 cm when located along the edge of the FATO nor penetrate a plane originating at a height of 25 cm above the edge of the FATO and sloping upwards and outwards from the edge of the FATO at a gradient of 5%.
- The surface of the safety area, when solid, shall not exceed an upward slope of 4% outwards from the edge of the FATO.
- Where applicable, the surface of the safety area shall be prepared in a manner to prevent flying debris caused by rotor downwash.
- The surface of the safety area abutting the FATO shall be continuous with the FATO.

4.2.2 Markings at the hospital helipad

- a. A heliport identification marking for a helipad at a hospital shall consist of a letter H, red in colour, on a white cross made of squares adjacent to each of the sides of a square containing the H, as shown in the Fig. 1 below.
- b. A heliport identification marking shall be oriented with the cross arm of the H at right angles to the preferred final approach direction.
- c. FATO marking shall be provided to surface level and elevated helipad which located along the edge of FATO.
- d. A FATO perimeter marking shall consist of a dashed white line with a width of at least 30 cm and length 1.5m, and with end-to-end spacing of not less than 1.5 m and not more than 2 m.
- e. TLOF marking shall be provided to surface level and elevated helipad which located along the edge of TLOF.
- f. A TLOF perimeter marking shall consist of a continuous white line with a width of at least 30 cm.
- g. However, in case of elevated helipad, the FATO and TLOF markings coincides. In such case, it should follow the TLOF marking specifications.
- h. Hospital Helipad name should be marked at the surface of the helipad.

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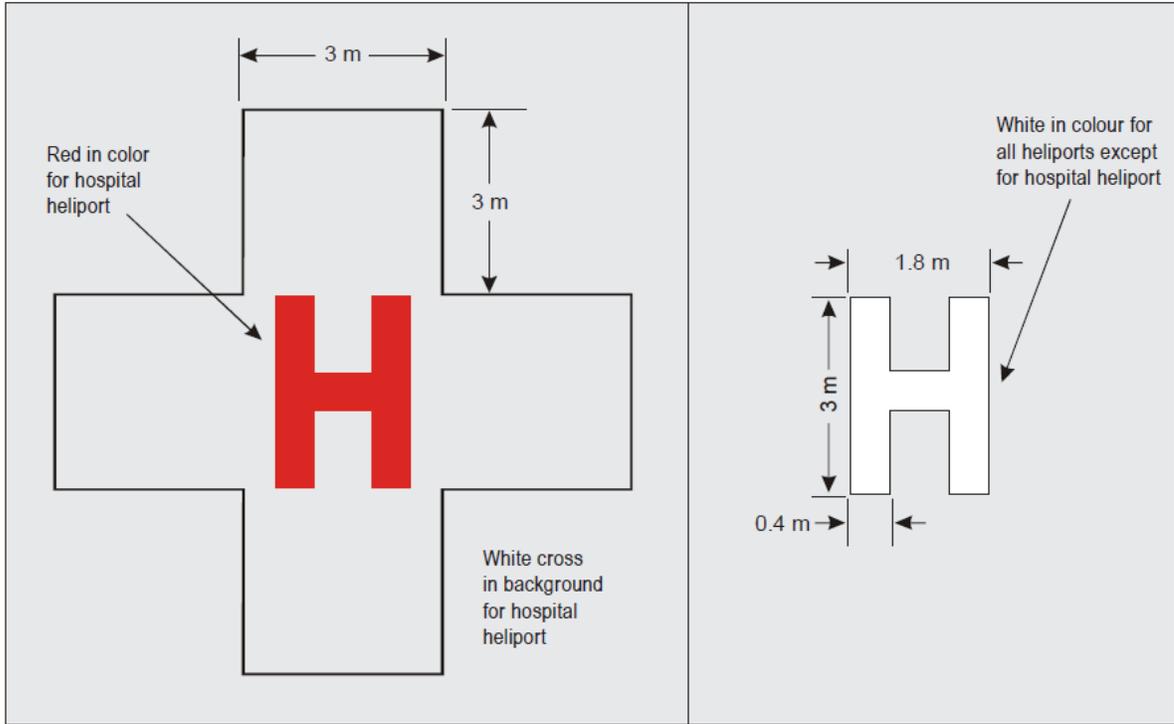


Figure 2. Hospital Helipad Marking

i. TLOF Weight/Size Limitation Box Marking

Mark the TLOF to indicate the length and weight of the largest helicopter it will accommodate, as shown in Figure 3. Place these markings in the lower right-hand corner of a rectangular TLOF, or on the right-hand side of the “H” of a circular TLOF, when viewed from the preferred approach direction. The box is 5 feet (1.5 m) square. The numbers are 18 inches (46 cm) high. The numbers are black with a white background.

Example Diagramme:

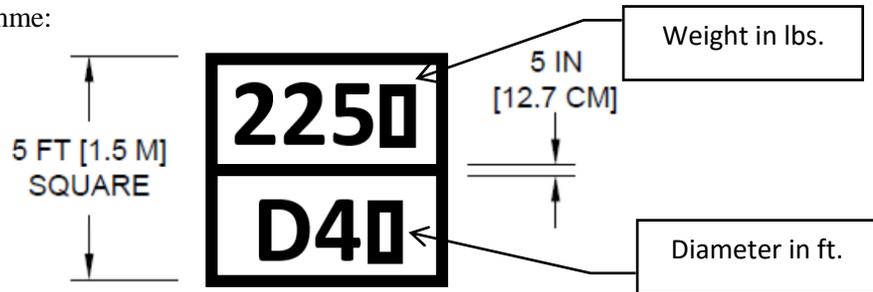


Figure 3. TLOF Weight/Size Limitation Box Marking

j. Prohibited Sector Marking

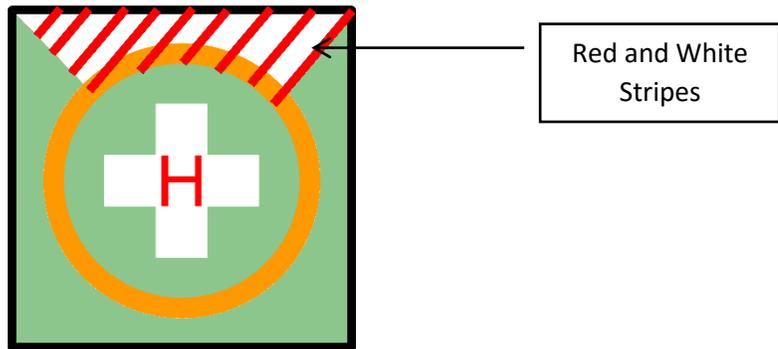


Figure 4. Prohibited Sector Marking

4.2.3 Deployment of the necessary facilities, such as windsock, safety net, obstruction marker balls and others

a. Windsock

- i. A helipad shall be equipped with at least one windsock.
- ii. A windsock shall be located so as to indicate the wind conditions over the FATO and TLOF and in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It shall be visible from a helicopter in flight, in a hover or on the movement area.
- iii. A windsock shall be constructed so that it gives a clear indication of the direction of the wind and a general indication of the wind speed.
- iv. Windsock should be a truncated cone made of lightweight fabric and should have the following minimum dimensions:

| | <u>Surface-level helipad</u> | <u>Elevated helipad</u> |
|------------------------|------------------------------|-------------------------|
| Length | 2.4 m | 1.2 m |
| Diameter (larger end) | 0.6 m | 0.3 m |
| Diameter (smaller end) | 0.3 m | 0.15 m |

- v. The colour of the windsock should be so selected as to make it clearly visible and understandable from a height of at least 200 m (650 ft) above the heliport, having regard to background. Where practicable, a single colour, preferably white or orange, should be used. Where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red and white, or black and white, and should be arranged in five alternate bands the first and last band being the darker colour.

b. Safety Net

- i. To mitigate the risk of damage to the properties and injuries to the helicopter passenger and helipad personnel dropping from the edges of elevated helipad, the safety devices such as safety nets or safety shelves shall be installed around the edge of the elevated helipad but shall not exceed the height of the TLOF.
- ii. The net should extend outwards to at least 1.5 m from the edges of the safety area (if solid) and be capable of withstanding, without damage, a 75 kg mass being dropped from a height of 1.0 m. It should be so manufactured that it provides a hammock effect for a person falling into it rather than the trampoline effect produced by some rigid materials.

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c. Obstruction Marker Ball

- i. If the hospital helipad, whether surface level or elevated, is in close proximity of the transmission line, obstruction marker balls of conspicuous colour (e.g. orange, red or yellow) shall be installed in the transmission line.

4.2.4 Obstacle Limitation Requirements

a. Approach/Take-off Surface

- i. The helipad should have at least two approach/take-off climb paths to avoid downwind conditions, maximize headwind conditions and minimize crosswind conditions.
- ii. Other approach/take-off paths should be based on the assessment of the prevailing winds or when this information is not available the separation between such flight paths and the preferred flight path should be at least 135 degrees apart.
- iii. Approach/take-off Surface shall have gradients of 8% ($\approx 4.6^\circ$) measured from outside edges of Safety Area with divergence of 10% until reaching 500ft above the surface of FATO, and the Approach/take-off surface shall not be penetrated by any obstacles, until and unless the results of an aeronautical study approved by an appropriate authority have reviewed the associated risks and mitigation measures.

4.2.5 Maintenance of helipad and associated markings

Periodic helipad maintenance plan should be developed by the helipad operator that should include the maintenance of the helipad structure, surface and markings. This should also include the obstacle review around the helipad, especially on take-off climb out and approach path and the mitigating measures.

4.2.6 Strength of the helipad

a. The surface of the helipad shall be:

- i. skid-resistant to both helicopters and persons and be sloped to prevent pooling of water,
- ii. resistant to the effect of rotor downwash,
- iii. Free of irregularities that would adversely affect the take-off or landing of helicopters.

b. For the elevated helipad Structural Design shall be carried out for the largest or heaviest type of helicopter that is anticipated to use the helipad and account taken of other loading such as personnel, freight, snow, refueling equipment, safety equipment, etc. For the purpose of design, it is to be assumed that the helicopter will land on two main wheels, irrespective of the actual number of wheels in the undercarriage, or on two skids if they are fitted.

c. When designing a FATO on an elevated helipad, and in order to cover the bending and shear stresses that result from a helicopter touching down and at rest on the helipad, the worst condition as derived from provisions of 1.3.2.3 and 1.3.2.4 of ICAO Doc 9261, Heliport Manual should be taken into consideration.

d. Helipad operator must produce structural stability/strength report from the elevated helipad construction company.

4.3 Helipad Operations

4.3.1 Helipad operations procedure

Hospital helipad operator shall develop the Standard Operating Procedure (SOP) for each helipad and submit to CAAN for approval. Such SOP should include the following items:

- a. Normal operation, including general weather observation and briefing
Normal operating procedures should be described and include consideration of following:
 - i. Daily inspection procedure of the helipad by developing the checklist that include the status of the helipad, helipad markings and supporting equipment and facilities.
 - ii. General Weather observation at the Helipad, and notification procedure to the helicopter operator.
 - iii. Procedures for notifying and responding to an arriving helicopter which should include the communications between hospital and helicopter, including radio operating procedures and phraseology
 - iv. Procedures for Helipad ground access control including inspection and securing helipad before helicopter arrives
 - v. Procedures during start-up of the helicopter and inspection of helipad after departure
 - vi. Records of helipad use including purpose, frequency and duration
 - vii. No person shall approach to helicopter until and unless helicopter engines are shut down unless otherwise permitted or directed by the flight crew. No person shall approach to helicopter from its rear.
 - viii. Loading and unloading procedures, including safety of personnel and equipment within helipad boundary
 - ix. If the operation at the helipad is unsafe because of weather, operational status or any other reason, helipad operator shall immediately inform the flight crew or helicopter operator, as appropriate.
 - x. No unauthorized person shall be allowed at the helipad during landing, take-off and engine run situation.
- a. Emergency operation procedure
 - i. Helipad operator shall develop emergency handling procedure in case of helicopter accident/incident or any other emergency arising at the helipad.
 - ii. Hospital Helipad operator shall develop Emergency Response Flow chart.
- b. Safety, Security Issues at the Hospital Helipad
 - i. Safety and security of helipad, helicopter and occupants of the helicopter and third party during the helicopter operation at the hospital helipad is the responsibility of the hospital helipad operator.
 - ii. Crowd Control
The helipad operator shall develop crowd control procedure at helipad during the helicopter operation. Responsibility of such control shall be clearly assigned.
 - iii. Foreign Object Damage (FOD) Control
The helipad operator shall have develop FOD control procedure at helipad during the helicopter operation. Responsibility of such control shall be clearly assigned.
- c. Medical Evacuation Procedure
 - i. The helipad operator shall have clear cut medical evacuation procedure which shall include the line of command during the evacuation.

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- ii. Hospital operator shall have developed a medical evacuation plan flow chart.
- d. Coordination procedure with Helicopter Operators
The helipad operator shall appoint the contact person responsible for coordinating with the helicopter operators. S/he should coordinate helicopter operator for the following matters:
 - i. Inform status of helipad, its operability
 - ii. Inform general weather conditions at helipad
 - iii. Other medical evacuation issues
- e. Maintenance of helipad and associated markings
The helipad operator shall have the responsible unit to take care about the helipad and associated facilities which should be held responsible for the maintenance of the helipad.

4.4 Helicopter Operation to and from the Hospital helipad

4.4.1 General Operating Procedure

- a. In case of operating at elevated helipads, the helicopter shall be able to maneuver into wind and land safely following a power unit failure.
- b. Flight crew shall have final authority for safe landing and take-off at the hospital helipad.
- c. If no communications with the hospital staff a high and low recce of the site will be performed prior to committing to a landing.
- d. When operating in the vicinity of an airport the flight crew should avoid the flow path of fixed wing aircraft and ensure that landing path is clear.
- e. Before departing from hospital helipad call ATC and give your departure intentions before take-off.
- f. Pilots should follow the any instruction or advice from the concerned ATS personnel.
- g. Always be cautious of obstacles especially the transmission wire and the pylons while flying low and during landing and take-off.
- h. During off-loading of patient the crews will maintain constant vigilance when rotor is running.

4.4.2 Crew Qualification for elevated helipad operation

Crew qualification for helicopter operation at elevated shall have meet the following criteria:

- a. Must have trained by IPs on landing techniques on elevated helipads.
- b. Shall have completed Initial Training before a pilot may conduct elevated helipad operations that includes a minimum of four landings and four take off at an elevated helipads.
- c. Shall have completed Recency training. A pilot should not operate to an elevated helipads unless they have carried out a minimum of two landings and two take –offs at the elevated helipads within the preceding 12 months. If the training conducted concurrently with the PPC to an elevated helipad, this may be considered as meeting this requirement, when the training has not been achieved, the pilot should establish recency by performing a landing and take-off at an elevated helipad with a Type Rating Instructor/Type Rating Examiner (TRI/TRE). When the pilot is qualified on more than one type it should be accepted that recency gained on one type will meet recency requirement on all types.
- d. Must have company as well as CAA authorization for execution of helicopter operations to and from elevated helipad.

4.4.3 Normal take-off and landing procedure

- a. Company shall develop normal take-off and landing procedures for each hospital helipad they wish to fly, especially for the elevated helipad. It shall include at least the following elements:

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- i. Identification of Approach Initiation Point and Decision Point (DP)
 - ii. Preferred approach and landing direction
 - iii. Circuit height
 - iv. Overshoot procedure
 - v. Obstacle (Hazard) identification techniques
- b. Before landing, the helicopter must be proved capable of doing Out of Ground Effect (OGE) hover with the existing all up weight and density altitude. An approach is to be made to a hover clear of the obstacles around the landing site.
 - c. The approach to the Decision Point (DP) must be as slow and shallow as possible and preferable flat but no greater than 4.6° approach gradient with overshoot capability requiring no greater than 4.6° departure gradient.
 - d. The rate of descent during the approach is to be minimal, especially below Effective Transitional Lift (ETL). If a Vertical Speed Indicator (VSI) is fitted, 300ft per minute is absolute maximum rate of descent allowed.
 - e. The approach should terminate into wind, or at most 90 degrees out of wind with any cross wind on the preferred (most efficient) side for the helicopter type.
 - f. Constant use of visual references is required to check drift and settling.
 - g. They must contact appropriate ATS units prior to takeoff from the helipad and before joining the required track or Heli-lane (if exists). They shall not climb above 500ft AGL until advised or instructed by the ATS personnel.
 - h. All the operators flying to a particular helipad, especially the elevated helipad shall have to follow the same procedure unless otherwise warranted by unfavorable or emergency situation.

4.4.4 Company requirement for the minimum dimension of helipad

- a. The company must appropriately determine the minimum dimension of helipad and surrounding safety area required for the surface level and the elevated helipads in their SOP.
- b. The flight crew must not operate into any such helipads which do not meet the above criteria.

4.4.5 Weather and status briefing of the helipad

- a. The flight crew must take weather and status briefing of the helipad before the flight on such helipad. For this, helicopter operator shall have established a mechanism for the exchange such information with the hospital helipad operator.
- b. If feasible or possible, they may request appropriate ATS unit for visual observation towards the helipad.

4.4.6 Communication and Coordination procedure with the hospital helipad

- a. The helicopter operator must have developed coordination procedure to communicate with the helipad operator for the exchange of information such as flight movement data, weather, operational status of helipad and any other useful information.
- b. A VHF radio should be used to provide arriving helicopter with weather, helipad conditions and traffic information but should not be used to control the air traffic. The hospital should contact CAAN and concerned ministry for information on VHF radio licensing.

4.4.7 Emergencies operation at the helipad

- a. Helicopter operator shall have developed an emergency operating procedure for each helipad they wish to operator.

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- b. Such emergency procedure shall include aborted take-off and landing manoeuvres taking into consideration of minimum harm to the helicopter, its occupants and the third party.
- c. In the event of an engine failure, helicopter would minimize the risk of injury or damage to property on the ground.

4.4.8 Noise abatement issue

- a. Helicopter operations, by their nature, are generators of considerable noise. Operators shall consider the effect of such noise when planning and conducting operations, particularly repetitive operation at the same area.
- b. The take-off and landing phases of flight generate the greatest noise, so operation shall be planned to minimize the effect of such noise during these phases of flight wherever possible.

Note: Helicopter operators willing to operate flights to and from hospital helipad shall develop a SOP for each such helipad that should include all the procedures as mentioned under the Requirement 4.4. Such SOP shall be approved by CAAN.

4.5 Rescue and Fire Fighting (RFF) Issues at the Hospital Helipad

4.5.1 Hospital helipad- surface level or elevated shall have provided with H1 category of firefighting service.

4.5.2 At least two trained personnel should be deployed at the operational area when helicopter is in operation, and when they are involved in RFF, they shall compulsorily use personal protective equipment (PPE).

4.5.3 Minimum amount of fire extinguishers to be deployed

- a. Principle Agent
 - i. Water
 - ii. Foam
- b. Complementary Agent
 - i. CO₂Gas
 - ii. Dry powder
 - iii. Halon

**Table 1.
Minimum usable amounts of extinguishing agents for surface level helipad**

| Principle Agents | | | Complementary agents | | |
|------------------|----------|--------------------------------------|---------------------------|----------------|--------------------|
| Category | Water(L) | Discharge rate foam solution (L/min) | Dry chemical powders (kg) | OR Halons (kg) | OR CO ₂ |
| H1 | 500 | 250 | 23 | 23 | 45 |

**Table 2.
Minimum usable amounts of extinguishing agents for elevated helipad**

| Principle Agents | | | Complementary agents | | |
|------------------|----------|--------------------------------------|---------------------------|----------------|--------------------|
| Category | Water(L) | Discharge rate foam solution (L/min) | Dry chemical powders (kg) | OR Halons (kg) | OR CO ₂ |
| H1 | 2500 | 250 | 45 | 45 | 90 |

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Deployment of other necessary rescue and firefighting equipment

**Table 3.
Rescue equipment**

| Equipment | Helipad Fire category, H1 |
|--|---------------------------|
| Adjustable Wrench | 1 |
| Axe, rescue, non-wedge or aircraft type | 1 |
| Cutters, bolt, 60 cm | 1 |
| Crowbar, 105 cm | 1 |
| Hook, grab or salving | 1 |
| Hacksaw, heavy duty complete with 6 spare blades | 1 |
| Blanket, fire resistant | 1 |
| Ladder, length appropriate to helicopters in use | 1 |
| Lifeline, 5 cm, 15 m in length | 1 |
| Pliers, side cutting | 1 |
| Set of assorted screwdrivers | 1 |
| Harness knife complete with sheath | 1 |
| Gloves, fire resistant | 2 pairs |
| Power cutting tool | 1 |

- c. Procedure of Handling RFF equipment
 - i. Fire extinguishing equipment should be stationed at the close proximity of the helipad in such a way that it will not constitute hazard to helicopter operation.
 - ii. There should be trained manpower for handling the RFF equipment.
 - iii. Hospital should develop the procedure for daily inspection of the equipment.
 - iv. No expired Fire extinguishers should be deployed in the helipad.
- d. Emergencies at helipad and RFF Procedure
 - i. Helipad operators should develop the SOP for handling the helicopter emergencies at the helipad.
 - ii. The firefighters deployed at the helipad shall be trained in handling the helicopter emergencies, especially the safe evacuation and firefighting.
 - iii. If an emergency exist at the helipad, the response time shall be within 2 minutes. However, for elevated helipad, the helipad operator shall response to the situation immediately considering that all the equipment and facilities are stationed at the appropriate location of the hospital helipad.

Note: Response time is considered to be the time between the initial call to the RFF service and the time when the first responding vehicle(s) or the service(s) is/are in position to apply foam at a rate of at least 50 per cent of the discharge rate specified in above Table 1 and Table 2.

4.6 ATS requirements regarding Helipad Operation to and from Hospital Helipad

4.6.1 Heli-lane and airspace issues

- a. Helicopters, where applicable, shall follow the Heli-lane as per the ATS instruction, otherwise follow the conditions as mentioned in the CAAN permission.
- b. Helicopters must respect the rules applicable to the airspace where they are flying.

4.6.2 ATC clearances

- a. Helicopters shall not join Aerodrome Traffic Circuit or enter into Take-off and Landing path of concerned Airport unless otherwise advised or cleared by ATC.

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- b. Helicopters should follow the ATC clearance, instruction or advice. If that is not suitable or applicable, they may request for alternate clearance, instruction or advice.

4.6.3 VHF two way communication:

- a. The helicopters must always maintain continuous listening watch on appropriate radio frequency and remain in contact with appropriate ATS units.
- b. Information before landing and take-off:
 - i. Helicopters must advise concerned ATS units, in VHF, before they land at the helipad.
 - ii. Before start up, if possible, they should inform concerned ATS unit in appropriate frequency, HF/VHF about their expected start-up and/or departure time.
 - iii. However, helipad operators shall have the appropriate means of communication with the helicopter operators to relay the above mentioned information to concerned ATS units.
- c. Information after landing and take-off
 - i. After landing, if possible, helicopters should inform concerned ATS units about the landing information.
 - ii. After take-off, the helicopter must not fly above 500ft AGL, or where applicable, the heli-lane altitude until establishing Two-way radio communication with appropriate ATS unit.
- d. Helipad operators shall have the appropriate means to communicate with the helicopters about the significant weather and status of the helipad before landing.
- e. Weather briefing towards helipad area
 - i. If the helipad is in the vicinity of Aerodrome, the ATS tower should advise helicopters the weather observation towards the helipad site.

Note: Helipad operator shall have the manpower trained on general weather observation (like Rain, Fog, Dust-storm, Snowfall, Thunderstorm, Cloud, etc.) to advise the helicopter operator the prevailing weather at the helipad before the operation of flight.

- f. VMC/IMC Issues

Hospital helipads shall be operated during the day time only (Flight Visibility not less than 5000m). Operations at such helipads during night time is strictly prohibited.

4.7 Overall training requirements

Hospital helipad operator shall include in its SOP the provision trainings to its staffs involved in helipad operations. The staffs of Helipad operation unit shall be provided with relevant trainings depending on the nature of their roles and responsibilities. Some of the relevant training are given below:

4.7.1 Helipad operations

- a. General marshalling techniques
- b. General radio communication techniques and phraseologies
- c. Crowd control techniques
- d. Brief knowledge of Helicopter Emergencies

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4.7.2 Medical evacuation

- a. Patient evacuation techniques
- b. Loading and unloading techniques

4.7.3 Firefighting knowledge and techniques

- a. Familiarization of helicopter
- b. Emergency rescue and evacuation procedure
- c. Handling of helicopter emergencies at the helipad, and engine shut down and battery off procedure
- d. Knowledge of Fire agents
- e. Handling RFF equipment
 - i. Forcible entry tools
 - ii. Fire extinguishers
- f. Casualty handling procedure
- g. Door opening procedure
- h. Use of safety gears, personal protective equipment (PPE)

4.7.4 General Weather Observation

- a. Knowledge of general weather phenomenon
- b. Knowledge of estimating wind from the windsock
- c. Knowledge of estimating general visibility

4.7.5 Helipad markings, maintenance and obstacle identification and removal

- a. Knowledge of helipad markings
- b. Knowledge of helipad maintenance
- c. Knowledge of obstacles around the helipad and removal process

4.7.6 Any other relevant training