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Heliport Design Issues Choosing the right “Design Aircraft”

During the conceptual design of any heliport project there is some important information relative to the pad size and clear areas requirements. In support of that I would like to offer the following for the consideration of the team as it relates to the FAA term of “Design Aircraft”:

The design aircraft is the largest actual or future model machine that will use the landing area. In essentially all regulatory environments, the size of the facility and the associated airspace is predicated on the physical size and performance of the using aircraft. In some circumstances, it may be a composite type of design aircraft where the gear dimensions and weight reflect one type of aircraft and the overall length or rotor size are from a different aircraft. The net effect of this, if the conservative factors of the worse case situation are considered, is the facility is designed with no limitations for the aircraft that it is intended to serve.

As most permanent facilities can have a life span of 20 to 50 years, it may be prudent to plan for future aircraft. For example, a hospital is currently using BK 117s as their primary Medevac aircraft. However, at any time within the lifetime of the hospital landing pad, it is possible that larger helicopters and tilt rotors may need or desire to land at that pad. If a pad is built only to the size and weight standards of the BK 117, it will not be able to safely handle anything larger. The FAA considers a helicopter the category of the Sikorsky S-92 to be a reasonable design aircraft, especially for hospitals and is their recommendation for any facility using federal funding for a heliport.

In the case of a trauma or receiving hospital an understanding of the maximum size of helicopter that can be used currently or in the future is essential for proper planning. Many National Guard and Army Reserve units have been called on in emergencies for helicopter rescue and medical transport. Typically the largest helicopter they use for such missions is the S-70 Blackhawk. As this is also the same size and approximate weight of the Sikorsky S-92, a corporate and utility helicopter that is currently being delivered, it is a reasonable aircraft to use for design purposes.

The manufacturer of that helicopter, as well as Sikorsky is pitching their larger helicopters to be put into medical emergency service as a portable triage, set up and even transport in major mass casualty events.

The future cost factors in under sizing a heliport can be significant. In the event of an actual need with no reasonable alternative for full use of an emergency plan, lives can be lost.

If a higher capacity heliport is designed into a new facility to start with the cost differential is expected to be minor, mainly for increased column sizing, pad design and allowing for additional open space. Under the current FAA sizing guidelines, the pad size for the S-76 is 45' x 45' while the suggested largest pad needs only to be 8' per side larger. A far more practical size is a 60' x 60' which can handle the growth version of the S-92 and all the military Blackhawk family. The biggest issue is in the structural considerations and size of the open area around the pad.

Due to design loadings, pad sizes and needed clearances, the vast majority of lower capacity heliports need a full replacement to include upsizing of columns to accept the larger helicopters. Unfortunately this has happened many times in the past. This is being passed onto you and your management as an opportunity to learn from others mistakes. The majority of the existing heliports in the HEMS system are designed for only smaller helicopters. This is a great disadvantage for future aircraft or for emergency or disaster use.

This issue first came to focus during the September 11, 2001 disaster. In anticipation of mass casualties from the terrorist attack in NYC, there was a plan to bring stabilized patients from local receiving hospitals to medical facilities outside of the immediate NYC area. The main transport would be helicopters from the active and reserve military units. In the Northeast, where hospital administration remembers that day and the alerts, it is very easy to recommend that heliport design make this provision.

It again came to light during Operation Desert Storm in the event of mass casualties either from the war itself or another 911 type of terrorist event spawned from the war. That is when the FAA decided to include their recommendation for larger hospital heliports.

One of the lessons learned in the Katrina disaster is the need or all hospital heliports to be designed for the disaster role they may be called upon to fill. This is not only for outgoing but for incoming stabilized patients from other hospitals closer to the site of the disaster in order to free up room in the close-in facilities.

In the case of typically new buildings can they can be designed to accept the larger helicopter as the open area can be made sufficient and the pad can be designed to accept the gear of the larger helicopter up to the S-92.

It is my suggestion and advice that the new pad on your complex be designed for the class of helicopters recommended by the FAA in their Heliport Design Advisory Circular. The same criteria should be used for the replacement of any current ground pad in the system. It should also be considered for all other new heliports within your control.

As a consultant, it is my duty to bring these issues forward to appropriate management for their consideration. If the management decides to use a smaller helicopter as the basis of design, they should acknowledge the input given and specifically state that it is their decision not upgrade to the higher capacity pad(s) recommended by HEI.

Several times in the recent past this issue has arisen at others heliports after being put into in service and a need for a larger helicopter to land was not able to due to capacity.

It is good practice to fully document these decisions for questions that may arise in the future. I have been successful in avoiding this issue when I am on the team by bringing these issues to the attention of management during the initial planning process.

Sincerely yours,



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Managing Member