Let's Get the Right Kit for Effective SAR

I read the article published in Issue 2, 2004, entitled "A Case for the CP-140A Arcturus SAR." It examined the suitability of using the CP-140A Arcturus (CP-140) as a SAR replacement for the C-130E Hercules (Herc) or the new Fixed Wing SAR (FWSAR).

Using the Herc for comparison (since the two FWSAR contenders, although smaller in size, have similar searching and cruising speeds, and overall capabilities), I'd like to offer a different point of view.

To start off, the Herc's slow searching speed (130Kts *vs* 200Kts for the CP-140) makes it an excellent search platform. It is extremely hard to find a person in the water (PIW) or even a 25' sailboat when travelling at 240Km/h, imagine when travelling at 370Km/h. The two contenders have an even lower search speed if needed (as it could be when searching for PIW).

It would be quite easy for the Herc or the two contenders to increase their search speeds to 200Kts; it only requires to retract the flaps and to push the throttles forward. On the other hand, it is impossible for the Aurora to reduce its searching speed to 130Kts. If pure flying speed was of the essence rather than the optimum probability of detection (POD), we should strap a couple of observer seats on the CF-18 and cover the area at Mach 1.

The search aircraft speed (SAS) is one factor that affects the sweep width and the coverage factor. The sweep width is a formula that accounts for the effect of weather, crew fatigue and search aircraft speed. The sweep width and the track spacing in turn affects the coverage factor as seen in the following formula: C = W÷S. When these and other factors are taken into account, the Herc's slow SAS becomes an advantage – not a disadvantage. In my opinion, the Herc is more efficient than the CP-140 when searching for a small target and as efficient, if not more, when searching for something bigger. The two contenders could, if necessary, slow down below these speeds when searching for PIW or other small targets, therefore increasing the POD.

The Herc has other advantages over the CP-140 when looking at POD. It is equipped with a full-size search window on each side (versus small bubble windows) and the view from those windows is not reduced by engine exhaust/fumes like on the CP-140. The two FWSAR contenders have paratroop doors, which can easily be replaced by full size search windows, and neither airplane is subject to the reduced visibility due to exhaust fumes.

The article mentions "Economical search speed," which I have never heard in nine years of working for SAR; nobody searches at that kind of speed unless you are looking for the *"Queen Elizabeth II."* In the same table, you also mention "Loiter-speed," which is in fact what we call "search speed." The difference in both searching speeds is 70Kts (130 Km/h), which is a huge difference when looking for a small to medium target. The SAR system has used, on occasion, the CP-140 as a communication platform and for initial searches at high altitudes but its overall search effectiveness (POD) at low altitudes is greatly diminished by its higher search speed and lack of proper spotter windows.

The article also mentions that the CP-140 carries two Survival Kit Air Droppable (SKAD) versus only one for the Herc. It should be said that the Herc also carries one medical toboggan, two major disaster toboggans (MAJAID), one pump (for sinking boats), numerous night illumination flares and smokes, more than 10,000 lbs of survival and extraction equipment and two Search and Rescue Technicians (SAR Techs). It is important to mention that, if the mission dictates, more equipment can be added in a matter of minutes due to the availability of a ramp/door and a cargo area. The FWSAR contenders have the same attributes (cargo size and lifting capability) to carry all of this equipment and are equipped with a ramp/door, which the Arcturus does not have. This last point is extremely important when dropping equipment and/or SAR Techs.

I know a SAR Tech who was asked, as part of a group, to study the feasibility of jumping out of the Aurora. This idea was quickly dismissed since the jumpers would need to exit the airplane at about 150Kts (about 275km/h), which would be extremely hard on them. Just ask SAR Techs that have jumped from a C-141 Starlifter in the U.S. (once is fun, but that's it). The Herc slows to about 120Kts (220 km/h), which SAR Techs like because the chute opening is fast but not punishing. The two FWSAR contenders have an even slower speed if needed.

It is important to note that the four primary FWSAR Squadrons operate on the same search platform to allow for easier and faster postings among them.

Obviously, three Arcturus could not cover all four squadrons; in fact, would not be enough to cover one squadron (if you add the sovereignty proposition as mentioned in your article). One airplane is always in maintenance, one is used for standby and the other one is used as a back up and as a training bird, therefore leaving zero airplanes for anything else. Also, the use of two different platforms in the SAR community would require SAR crews to be proficient/current on both airframe types, which is highly inefficient.

There are many more points that I could bring up but this should be enough to prove that the Arcturus is not an adequate primary SAR platform and should not be considered by anybody as such.

In conclusion, the Herc and its contenders are much better suited for a SAR role than the Arcturus. Even though the Arcturus could ultimately get to a crash/sinking site faster than the other three airframes, its capacity to search and provide medical attention (in the form of SAR Techs and equipment) is far from stellar.

Instead of trying to use platforms for missions that they were not intended/built for, let's focus on buying the proper equipment so that the Canadian Forces can do the job right. FL

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Ideas expressed in this article are personal views of the author and not necessarily the views of the Canadian Forces.