The ASRC 40/40 Conference was a remarkable event! The talks covered a wide range of subjects relating to missing person search and rescue. Those who were able to attend the excellent set of history talks were provided with a unique insight into why the ASRC was formed, the changes over the years, and the major searches that influenced its direction. Old Rag, Six Friends, Nelson County, Green County, Jacob Allan were all incidents where ASRC tools, technique and talent made a real difference in the outcome. The ASRC has always pushed the state of the art in missing person search. Early use of ICS, research in lost person behavior analysis, use of radio systems and management systems for "search in the large" are just some of the ways the ASRC has changed how we, and others, do search, driving all of us to excel in our primary mission: missing person search.

But, as they say, that's ancient history. What I've been asked to provide is a vision for where the ASRC will be leading in the next 40 years. Let me start by saying, these are not my ideas. People who know a lot more about SAR than I do, people who are much smarter than I am, have set our direction. I listen to what others have to say and try to spin a number of different threads into a stronger yarn. These threads come from a number of places. If you don't subscribe to the ASRC mailing lists, you should. The conversations that happen on those threads are always interesting (given a broad definition of interesting). If you have not attended the ASRC retreats, you should. The late night discussions, sometimes helped by ETOH, are where some of the really innovative things happen. If you think discussions on States Rights v Federalism or quantum probability distributions don't have anything to do with the ASRC, you need to attend.

When thinking about the future of the ASRC, about how we are going to advance the state of the art in missing person search, I have categorized the ideas into two buckets. *How will we do what we do now, but better*? and *How will we radically change how missing person search is performed*? In October of 2013 we published the ASRC Strategic Plan; every initiative I'm going to discuss is consistent with that plan. If you don't remember the main tenets of the plan, I strongly suggest you take some time and read it over.

The first item in the "doing what we do now but better" bucket is Training & Certification. The ASRC training standards are excellent - there are none better. The ASRC FTMs and FTLs are the meat and potatoes of search. The ASRC training standards are rigorous enough that our FTM's are often field promoted to lead teams and our FTLs are asked to help in incident management. Now we need to focus on how we certify that our members have met the requirements of their positions. The RAs and the AHJs that we serve need to believe that the ASRC responders can perform at the levels specified by our training standards. From their point of view, the RA/AHJ want to

believe that the ASRC teams are not self-certifying organizations. The proposed solution to this is the implementation of Position Task Books, PTBs for all of the ASRC positions. PTBs are a known quantity and should be readily accepted by County & State officials. Because we serve at the pleasure of the RAs & AHJs, making sure they accept our team members' certification is critical for the Conference moving forward. The PTB project is critical to the ASRC's success.

We need to get better at searching in urban & suburban areas. Teams are seeing increased call outs for missing persons in these types of areas. RA's are learning that the ASRC teams have training that makes them better suited for this task than the local fire company. We need to continue to hone and market this ability.

The next item in the "doing what we do now but better" bucket is Application of Technology, an area where the ASRC is making great progress. Technology does not replace boots on the ground, but it can be used as a significant force multiplier. We have all had the experience of having to fill out TAFs by hand or of coloring in segments on task maps. We have all been on searches where someone from the command staff has come out to staging to get some "human copiers", those folks who fill in all of the mission constant fields (incident name, location, date, base call sign…) of a TAF. There is no reason, in the days of computers, to operate in this manner. We need all of the teams to have the technology necessary to produce TAFs and task maps, the stuff needed to get teams in the field.

When the teams come back from their tasks, there are maps, Tasks Completed & Tasks In Progress, to be updated. We need to run cumulative POD and shifting POA calculations and we need to do all of this at night when the command staff is tired, sleep deprived and generally cranky. Again, this is something that a computer is pretty good at. Why not use this technology and let our command staff get some sleep.

Technology also plays an important role in Planning. Trying to assign an initial POA? What lost person behavior planning model, from your favorite Bob Koester book, are you going to use? The ring model? The mobility model? The terrain model? What about seeing them all plotted and allowing you to pick one? Again this is a great application of technology.

The work Don Ferguson and his cohorts have been doing in this area is pretty amazing. Five years ago Don & I sat together at the end of a SAR simulation and talked about the current shortfalls of the technology. Today, the technology is here and ready for prime time. Everything we need to support missions is now available, except multiple Don Fergusons. We need each of the ASRC teams to develop a working capability in the use of the new technology support tools. Along with these new tools we gain the ability to have support functions that are not physically at the search – Remote Support. Now, planning can happen while a team is responding to a search. Or it can happen overnight when the on-site staff is getting some sleep.

Another technology that will become important is unmanned aerial vehicles - UAVs. While our ability to make use of UAVs during a search is still a little while off, we need to be thinking, now, about how we are going to make use of this new tool. Once we better understand the mission parameters, we can start to talk about the technical

capabilities needed of the UAVs. Already ASRC members are in communication with people in the research community who are working on this problem.

The important take away is that these technology tools are force multipliers, not replacements for boots on the ground. We are often short of trained resources, especially early in the search. Who would not want to make better use of the scarce resources we have at our disposal?

The final item in my "doing what we do now but better" bucket is progressing the use of ICS during missions. The ASRC has long been a strong proponent of using ICS during search operations. We were using it long before Bush-43 issued Homeland Security Presidential Directive 5 directing DHS to establish NIMS. Long before NIMS 100, 200, 700, 800 were around and required, the ASRC was using ICS to manage its operations. Local emergency operations have progressed and we must now figure out how to fit into incidents that have an established incident command structure. Gone are the days when the ASRC would show up to a search and the local RA would say: "Please take over as the IC for me". For the most part, the local authorities have trained to run large incidents. They have not trained to manage large searches and this is where the ASRC shines. We need to foster relationships with the RAs and the AHJs in our response areas so that when we are called to a search, they feel comfortable allowing us to manage the search and we feel comfortable allowing them to manage the incident. Do you really need to think about where to get Porta-Pottys or are your skills put to better use making sure teams are in the field?

Now, I'd like to move on to the areas where I think the ASRC will radically change how missing person search is performed, not just for the ASRC teams but also for search teams across the country.

In 2003 a researcher named Jack Frost published: "*Compatibility of Land SAR procedures with Search Theory*". This was a 177-page paper that, basically, said the things we, the land SAR folks, thought we knew about formal search theory were all wrong. In this paper Jack stated: "*This report concludes that it does not appear there has ever been a comprehensive attempt to apply the science of search theory to the development of land search planning techniques*". He then goes on: "*There is clearly a great deal of room for improvement as search theory can make substantial contributions if properly applied. There is also a critical need to rectify some of the crucial misunderstandings that could have a significantly detrimental effect on future inland search operations*". If you are interested in land search management, its history and how we have been (incorrectly) applying it, this report is a very worthwhile read. If you have a history of high blood pressure or are prone to fits of screaming, I advise reading the report in short chunks.

The first item in my "How will we radically change how missing person search is performed" bucket is in direct response to Jack's paper. We need to change how we deal with Probability of Detection (POD). You have all had the experience of coming back in from a task and being asked during the debriefing process for your POD. You conjured up the classic description of: "If there were ten milk cartons in your search area, how many of them would you have found?" Then you gave a number, your POD. Maybe you gave 50%, maybe you gave 70%. What if you were asked a slightly different question:

" If there were ten milk cartons in your search area, how many of them could you have missed?" This number is 1-POD and I am confident that those two numbers would add up to greater than 10 or 100%. In search management we have known for years that people are not very good; no, people are terrible, at determining their actual POD, but we have used those numbers to calculate POD, cumulative POD, shifting POAs and finally POS. By the way, notice that POA and POS are planning quantities, yet we are asking operations for POD. This practice must change. We need to start making use of the concept of Effective Sweep Width – ESW.   ESW is a measurement of how a particular sensor (field team, air scenting dog, FLIR) performs. In the land search arena, ESW is affected by a multitude of conditions not found in the marine search environment, which has allowed those who are resistant to change to say "Not in my command post – it's too complicated". We must change that attitude and start making use of ESW in our planning. We need to teach FTLs how to do an Average Maximum Detection Range (AMDR) experiment, a slightly more complicated rain dance, in the field. We know from experiments that AMDR relates closely to ESW. We then need to make use of technology (yes, it shows up here too) to track the other parameters (track length, time in field…) needed to calculate POD. By the way, if you Google "AMDR and ESW" you find references to papers written by members of the ASRC! Members of the ASRC (Bob Koester & Ken Chiacchia) have been instrumental in doing the experiments and analysis needed to make ESW a workable concept. If you ever have a chance to participate in one of the ESW experiments you should do so. It is a great experience and it helps push the state of the art.

Next in my radical change bucket is looking at how we do scenario analysis. After we get out our initial reflex tasks, one of the next things we do is start looking at scenarios: given what we currently know, how did we get here and how does that affect where we should be looking?   We come up with a number of ideas; do some type of consensus exercise (Mattson, Proportional) to determine which scenario we think is most likely and we discard the rest. Using the Chosen scenario – with a capital C, we assign initial POAs to pieces of real estate and we start dispatching additional field tasks. We pat ourselves on the back for how well we did coming up with scenarios and deciding which one was right. And then, we never look at them again. We very reluctantly allow those little things called clues to change our worldview. We need to change how we deal with clues and how those clues affect our view of what happened: the Chosen scenario. We need to start thinking like intelligence analysts. As new information flows in, we need to reevaluate the scenario we are using and the scenarios we initially discarded. There are a number of techniques used in the intelligence community; Analysis of Competing Hypotheses - ACH, being a common one. We need to learn that it is OK to take techniques from other disciplines and apply them to our problems.

If your head is spinning from the thoughts of ESW and ACH you should just skip over this next one. If you want to get an idea of the types of conversations that happen late at night during the ASRC retreats, please read on.

We know when we send teams out into the field they sometimes end up in the wrong place. We also know that field teams often do not search the entire area assigned to them. This is not because the FTLs are incompetent or the team does not want to do what it has been assigned. As hard as it is to believe, the people in base sometimes get it wrong.

Sometimes the search segment is too large. Sometimes the vegetation (can you say rhododendron) in the segment makes it just a little difficult to get through.   Remember back a couple of pages ago when I opined on the use of technology? Assume a search where every member of every team has a GPS. Also assume that the management team is using tools endorsed, if not created, by Don Ferguson. That team can use those tools, Bob Koester's information on lost person behavior and analysis of competing hypotheses to determine the highest probability area to search. We can then write a TAF that says go to this specific GPS coordinate, separate your team members by 3 meters and search around. No segment descriptions, just search around that point. When the team comes back in from the field, their GPS tracks are downloaded and we have a perfect view of where the team searched. More than that, because we asked the FTL to do an AMDR when he got to the assigned location, we can calculate the POD and the exact area searched.   We don't need no stinking segments!

There it is, my vision of how we, the ASRC, are going to change how missing person search is performed. Some of the ideas are reasonably down to earth; some are a little further out. Is this what will actually happen? There is no way for me to know. However, what I do know, based on past history, is that the ASRC will be a driving force in extending the state of the art in missing person search. Over the last 40 years we have pushed boundaries and established new ones. I have complete confidence the ASRC will continue this proud heritage in the next 40 years.

Thank you for your time and your service.

July 12, 2014
Don Scelza, Chair

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That Others May Live