Topics in Inland Search Management

1st Edition

09/01/2016

Tucson, Arizona, USA

1st Edition

Printed in the United States of America

Collator

David Lovelock, University of Arizona, Win CASIE III, and SARAZ.ORG, AZ

Disclaimer

The purpose of this document is to support a course in managing a missing person incident conducted by competent search, rescue or emergency response leaders. It does not in itself constitute training in searching, search and rescue (SAR), search management or incident management either in its original form or in a modified form. The Southern Arizona Rescue Association cannot accept any responsibility for any outcome arising from the use of this document. The Southern Arizona Rescue Association may not be held liable in any way for any loss, cost, damage, liability or expense arising from the use of this document. The Southern Arizona Rescue Association cannot be held liable in any way for any occurrence in connection with an individual's use of the material contained in this document that may result in injury, death or other damages.

Preface

Why a 'Topics in Inland Search Management' document

This document has its origin in a series of articles I wrote in 2009 for a Southern Arizona Rescue Association (SARA) newsletter, produced by Brian Janezic, and aimed at incoming SARA members. Unfortunately, the newsletter did not survive, but I thought I'd polish and update my articles, add additional ones, and create this document.

While almost everything in this document can be found in SAR manuals, it isn't always easy to find the answer to a specific question. That is what this document tries to address. It is aimed at people fresh to SAR and those whose memory has faded since taking an Inland SAR Management course decades ago.

This document is designed to be "dipped into" rather than read from cover-to-cover, although it can be used that way.

Navigating this Document

This document uses "hot" links allowing the reader to navigate easily. For example, if the text states that the Table of Contents starts on page vi, then clicking on that page number (vi) takes the reader to the Table of Contents. (Try it!) In the Table of Contents, which starts on page vi, clicking on a Topic title (not the page number) immediately opens the associated topic. Web links, such as `http://sarci.org/sara/`, open the associated web page in the default browser. Typically the color or shape of the cursor changes when over a hot link, which can be seen by hovering the mouse over the previous web link.

Most PDF readers have the facility to return to the previously viewed page, allowing the reader to follow a hot link and then return to the original page containing that hot link. For example, Adobe Reader®, Foxit Reader, and Sumatra PDF, all use the keyboard combination Alt ← to return to the previously viewed page. In Preview (the default PDF reader on Macs), the equivalent keyboard combination is ⌘ [.

At the bottom of most pages in this document, following the copyright notice, there are two buttons, Acronyms and Topics. Clicking on these hot-links opens the Acronyms (a list of abbreviations commonly used in SAR), or the Topics (a list of all topics covered in this document).

Acronyms, Abbreviations, Terms, and Resource Names

There are numerous acronyms, abbreviations, terms, and resource names used in SAR and in the Incident Command System, sometimes more than one for the same item. In the case of these conflicts, the authors use the expressions suggested by FEMA, `http://www.fema.gov/pdf/plan/prepare/faatlist07_09.pdf` and `http://www.fema.gov/pdf/emergency/nims/508-8_search_and_rescue_resources.pdf`. A summary of the corresponding terms used in this book can be found in the Acronyms (see Topic 59 on page 135).

Typeset

This document was typeset with MiKTEX, available from `http://miktex.org/`, using TEXstudio as the front end, available from `http://texstudio.sourceforge.net/`.

Acknowledgments

We would like to thank the following people for their valuable ideas, contributions, and support.

Paul Anderson, Aaron Dick, Mike Ebersole, Dale Mann, Chuck McHugh.

Finally, we would particularly like to thank the Arizona Search and Rescue Coordinators Association Ltd. for permission to quote extensively from their publications "Initial Response Incident Commander Wilderness SAR", "Inland Search Management for AZ SAR Coordinators", and "Find 'Em: A Guide for Planning the Missing Person Incident Response", copies of which can be freely downloaded from `http://www.saraz.org/`.

Please email any corrections or suggestions to David Lovelock at `dsl@math.arizona.edu`.

David Lovelock

Topics

IV ICS—Incident Command System

V Miscellaneous

Part I
Overview

 Acronyms Topics

TOPIC 1

What Types of Searches are There?

Generally, there are two types of searches.

1. **Route and Location Searches**.
   These are searches where routes[1] and specific locations are the primary focus of the search resources.

   A Route and Location Search is usually characterized by the following.
   - There are no identified search segments. Routes and locations are searched, rather than areas.
   - The subject has been missing for a short time.
   - Only a few local resources are used (ridge runners, trail runners, etc.) and only a few agencies are involved (one sheriff's department, SAR volunteers, etc.)
   - The subject may be moving or stationary (mobile or immobile).
   - The subject may be responsive or unresponsive.
   - There is a quick resolution—one way or the other.
   - The press might get involved, but usually not on the front page.

   A Route and Location Search is usually the first type of search used during the initial response phase of a search. (See Topic 13 on page 30.) Such searches are called **Hasty Searches**. The purpose of the hasty search is to cover the most obvious places a subject might be in the least time possible. The term "Hasty" is used to stress the urgency and immediacy of the search—it indicates that the search is being conducted in a thoughtful, skilled, and professional manner.

   About 85% of such searches are over within the first 12 hours.[2] About 97% of all searches fall into the Route and Location Search category, and they are over within 24 hours.

   Generally, the remaining 12% of Route and Location Searches, which are over between 12 and 24 hours, go into another operational period. If after 24 hours the subject is not found, but there is evidence that the subject is mobile, then the extended search continues where routes and locations are still the primary focus of the search. However, if there is no evidence that the subject is mobile, then Route and Location Searches generally transition into Area Searches.
2. **Area Searches**.
   These are searches where segments (areas) are searched, rather than routes and locations. These searches are preceded by a consensus, where it is assumed that, if the subject is in the search

[1] The term "route" used in this context includes all forms of travel aids, such as pathways, roads, game trails, railroad tracks, ridges, valleys, dry washes, drainages, streams, shorelines, clearcuts, power lines, vegetation lines, or any geographic feature that provides a sense of direction and a path of little resistance.

[2] This time is measured from when the initial report is made until the time the last searcher arrives home, so the actual search is considerably shorter than this.

area, then the subject is immobile. Only about 3% of searches reach this stage, but those that do are memorable and instructive!

An Area Search is usually characterized by the following.

- It covers many operational periods.
- Multiple resources, not all local, are used (ground teams, canine, helicopters, fixed-wing aircraft, horses, 4WD, ATV, climbers, infrared, etc.).
- Multiple agencies are involved (Sheriff/Police/Highway Patrol, National Park Service, Forest Service, FBI, military, SAR volunteers).
- The search area is identified and divided into non-overlapping segments. (See Topic 26 on page 59.)
- There are many search segments. The emphasis is on searching areas rather than searching routes and locations.
- Search Theory is used.
- The subject is assumed to be immobile (stationary).
- There is lots of press coverage, both good and bad, with some on the front page.
- There is pressure, anxiety, and criticism.
- Lots of untrained volunteers, second-guessers, and "experts" come out of the woodwork.

In this type of search, the primary search tactic used is some form of a grid search,[3] in the widest sense. (See Topic 37 on page 78.) This would include a helicopter using a creeping line search, a ground team using critical separation, or a handler using an air scent dog. Hasty tactics might also be used in Area Searches. For example, if a search team discovers tracks then a tracking team might follow those to allow the search team to complete its assignment.

A search that goes beyond the Initial Response, see Topic 13 on page 30, is also called a **Multi-Operational Period Search**. Depending on the status of the search, a Multi-Operational Period Search could either remain as a Route and Location Search or transition to an Area Search.

There is another type of search, called a **Bogus Search**.[4] This occurs when, unknown to the searchers, the subject is not missing at all, or if the subject is missing, has left the search area and is now safe, at home, at the movies, in a tavern, ...

[3] Grid searchers form a line, with trained team members at a specified distance apart, and progress through the assigned area together.

[4] This is the current terminology. Previously it was given another name, also starting with the letter 'B', which suggested that it was an illegitimate search. That terminology is still prevalent.

TOPIC 2

What is the Difference Between a 'Route And Location Search' and an 'Area Search'?

In addition to the points mentioned in Topic 1 on page 10, there are other factors that enter a Route And Location Search.

- The command and general staff consists of only one or two individuals.
- The most-likely regions to search are determined from experience and instinct.
- Search teams consist of no more than three people.

Area searches usually evolve in one of three ways.

1. The Route and Location Search fails to find the subject.
2. The subject is reported missing long after disappearing.
3. An aircraft disappears in flight.

Aside from scale, searchers in the field may see very little difference between these two types of searches, except they may spend more time off-trail during an Area Search.

However, to the command and general staff the difference is enormous.

- The command and general staff is usually much larger than one or two individuals.
- Hot areas are identified using search theory, and terms like Mattson consensus, POA, ROW, POD, CPOD, are used.
- Software, such as CASIE, is an essential tool to keep track of hot search areas.
- ICS plays a big role in the logistics and documentation of the search. Terms like IAP, Segment, Consensus, POA, POD, ROW, are used.
- Search teams consist of up to seven people.
- After many operational periods the subject may still be missing.

Area searches are few and far between, but when they occur they remain in searchers' memories for years, and are frequently referred to privately by name, such as "The Smith Search", "The Jones Search", and so on.

Learning to run Area Search is a perishable skill, so constant retraining is essential.

 Acronyms Topics

TOPIC 3

When Do We Search?

When do we search? Day and night. However, for night searches, it is the duty of the Incident Commander to balance the search urgency against the safety of the searchers.

The tactics used for night searches may differ from day searches. For example, if the search is in unfamiliar or dangerous territory, or the weather is bad, then the emphasis at night might be on passive search tactics such as placing resources at safe locations to contain the subject, thereby restricting the size of the subsequent search area. These resources can shout the subject's name to attract their attention. They can also interview non-SAR personnel in the search area who might have valuable information about the subject.

Advantages of Night Searching

- Some resources search well at night, for example, canines, resources using night vision goggles, human trackers, FLIR, and thermal-imaging devices.
- Because it is quieter at night than during the day, human voices and sounds carry farther. This increases the effectiveness of any search tactics involving sound.
- Light signals from the subject are more easily detected by searchers.
- The subject is usually immobile at night. There are two advantages to this. Subjects are more likely to hear searcher sounds, and searchers on trails can overtake them.
- Searchers have the ability to control the angle of light from flashlights to best illuminate tracks and cast shadows.

Disadvantages of Night Searching

- Even with a full moon, visibility is not as good as in daylight.
- There is an increased risk to searchers. Aside from a hazard like the terrain, deer and other prey often move at night, which attracts predators such as mountain lions and bears.
- A missing person could be injured while attempting to move towards searchers.
- Clues can be missed or destroyed.

If the decision is made to not search at night, then serious consideration should be given to leaving units in the field for containment purposes. It would be embarrassing to withdraw all resources from the search area, and allow the subject to move out of the search area undetected.

 Acronyms Topics

Part II
Route and Location Searches

 Acronyms Topics

TOPIC 4

What is the Initial Report?

A search normally begins when the Initial Response Incident Commander, IRIC, is notified, either directly or by agency dispatch, of a potential missing person incident through an Initial Report. This report may come from different sources in different ways.

- By telephone/cell phone from the reporting party.
- By cell phone from the missing subject—self-reporting.
- By radio.
- In person.
- By finding an unattended vehicle or equipment.
- Through an alert from a Satellite Emergency Notification Device (SEND)—such as SPOT and InReach—or a Personal Locator Beacon (PLB).

The Initial Report should contain answers to the following questions: Who? What? When? Where? and How?

- Who?
  - Who is missing? Physical description: Name, height, weight, age, build, hair color and length, eye color, complexion, distinguishing marks, clothing worn, medical issues, ...
  - Who is the reporting party? Name, relationship, location of Reporting Party. Re-contact information.
- What?
  - What happened?
  - What is going on now?
  - What were their trip plans?
- When? When was the person last seen?
- Where? Where, exactly, was the person last seen?
- How? How did they go missing?

 Acronyms Topics

TOPIC 5

What is an LPQ?

An initial report Lost Person Questionnaire (LPQ), sometimes known as a "Thumbnail Sketch" or a "Missing Person Questionnaire", is used by most agencies and organizations to gather and organize the initial report information. It is usually no more than one or two pages long, and focuses on that information critical in the early stages of a search. See Figure 5.1 on page 17 and Figure 5.2 on page 18 for an example.

The LPQ is completed early in the incident while interviewing the reporting party. The investigator should develop a rapport with the reporting party and maintain that contact throughout the incident. The LPQ likely prompts more questions and areas to investigate. One of the goals in the initial investigation is to determine the nature of the incident. Not every missing person report requires a SAR response. Some cases can be resolved through the initial investigation. For example, there have been cases where a hiker is reported overdue by a third party. During the initial investigation local hospitals were checked for the subject or any unidentified persons matching the description and as a result of those inquiries missing/overdue persons have been located in the hospital suffering from a medical condition.

Later, a more detailed form of the LPQ can help the IRIC or investigator guide the follow-up or continuing investigation and focus on that information most helpful in resolving the search. There are numerous versions of LPQ's in use across the country. Win CASIE III has examples of both short and long form LPQ's that are quite complete and useful. This initial information can be input into Win CASIE III as a part of the Initial Note.

 Acronyms Topics

Search and Rescue Report

Investigator

Date	Time	Department Report Number	Incident Number	Reporting Officer

Source of Information

Name	Address	Town	St

D.O.B.	Social Security Number	Age	Sex	Height	Weight	Hair	Eyes

Relationship to Subject	Phone Number	Second Phone

How / Where to Contact Now	How / Where to Contact Later

What Reporting Party Believes to Have Happened

Subject Information

Name	Age	Sex	Nickname(s)

Home Address	Town	St	Zip

Local Address	Town	St	Zip

Home Phone	Local Phone	D.O.B.	Social Security Number

Cell Phone	**Cell Phone Carrier**	**Email Address:**

Physical Description

Identification	Clothing / Style	Color	Size	Health
Height:	Shirt / Sweater:			Overall Health:
Weight::	Pants:			Physical Condition:
Age:	Outer Wear:			Medical Problems:
Build:	Inner Wear:			Psychological Problems:
Complexion:	Head Wear:			Medication:
Distinguishing Marks:	Rain Wear:			Amounts:
Eyes:	Gloves:			Consequences of Loss:
Hair Color:	Extra Clothing:			Eyesight w/o Glasses:
Hair Style:	Footwear:			Medic-Alert:

☐ Beard ☐ Jewelry
☐ Mustache ☐ Photo Available?
☐ Sideburns ☐ Return Photo?
☐ Glasses ☐

☐ Sole Sample Available
☐ Scent Articles Available
☐ Scent Articles Secured
☐ Clothing Visible from Air?

☐ Smoker ☐ Hitchhiker
☐ Alcohol ☐ Religious
☐ Drugs ☐ Educated
☐ Gum ☐ Local Hero
☐ Candy ☐ Extravert
☐ A Leader ☐ Introvert
☐ A Survivor ☐ Loner
☐ Legal Problems ☐ Depressed
☐ Personal ☐

Youth / Child	Equipment			
☐ Afraid of Dark	☐ Pack	☐ Stove	☐ Skis	☐ PLB
☐ Afraid of Animals	☐ Tent	☐ Fuel	☐ Snowshoes	☐ GPS
☐ Afraid of Strangers	☐ Sleeping Bag	☐ Compass	☐ Money	
☐ Cry When Hurt	☐ Ground Cloth	☐ Map	☐ Credit Cards	
☐ Cry When Scared	☐ Fishing Gear	☐ Food	☐ Other Documents	
☐ Hides When Afraid	☐ Climbing Gear	☐ Knife	☐ Rope	
☐ HUG-A-TREE Trained	☐ Liquid Container	☐ Camera	☐ Camp Tools	
☐ Has a Safety Word	☐ Fire Starter	☐ Light Source	☐ Sat Phone	

Continue ➡

Figure 5.1: An example of a Lost Person Questionnaire—Page 1

 Acronyms Topics

ICS SAR 201B CCSO Version ICS Form 3/2008

Place Last Seen

Date	Time	Common Name / Description

Description	Additional Comments
Subject Last Seen by:	
Talked to Subject About::	
Weather Since:	
Subject's Direction of Travel:	
Subject's Attitude:	
Subject's Condition:	

Subject's Trip Plans

Itinerary	Transportation	Additional Comments
Started At:	Transported By:	
Date:	Vehicle Location:	
Time:	Make / Model:	
Destination:	License:	
By Way of:	Vehicle Location Confirmed By:	
Purpose:	Time Confirmed:	
Length of Stay:	Additional Vehicles at Scene:	
Size of Group:	Alternate Plans / Routes:	
Has Subject Made This Trip Before:	Discussed With:	

Subject's Outdoor Experience

General Experience		Additional Comments
☐ Familiar With Area	☐ Travels Alone	
☐ In Area Recently	☐ Stays on Route	
☐ Formal Outdoor Training	☐ Travels X-C	
☐ Medical Training	☐ Lost Before	
☐ Scouting	☐ Will Stay Put	
☐ Military	☐ Keeps on Move	
☐ Overnight	☐ Climber	
☐	☐ Athletic	

Contacts Upon Reaching Civilization

Name of Person That Subject Would Contact	Relationship	Phone	Who Is There Now

Overdue Groups

Description	Group Characteristics
Kind of Group:	Personality Clashes:
Leader:	Actions if Separated:
Experience of Group / Leader:	Competitive Spirit:
Local Point of Contact:	Intragroup Dynamics:

Actions Taken So Far

By Family / Friends	By Others

ICS SAR 201B CCSO Version ICS Form 10/04/01

Figure 5.2: An example of a Lost Person Questionnaire—Page 2

TOPIC 6

What is a Search Urgency Rating Chart?

Once the initial report details are collected, the information analysis phase begins. From this initial report information, together with the weather and terrain profiles, the IRIC determines the Search Urgency by completing the Search Urgency Rating Chart shown in Table 6.1 on page 20.

One number in each category (row) is selected. In some categories there is a choice of numbers, for example, under "AGE OF SUBJECT:", "Other", either a "2" or a "3" can be selected. After selection, the numbers are totaled giving the numerical rating. The lower the numerical rating, the higher the relative emergency. See Figure 6.1. All ratings are relative and their total indicates a possible relative urgency.

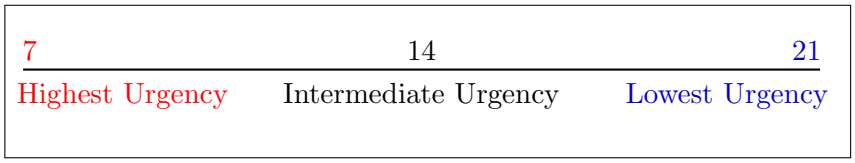


Figure 6.1: Relative urgency and numerical rating

Before determining the final Search Urgency, the IRIC must also take into account any other factors bearing on the incident but not listed on the urgency chart. However, if any of the categories in Table 6.1 on page 20 is rated a "1", then consider responding immediately with high priority. Otherwise, the preponderance of checked categories provides an indication of the urgency level. It is a good idea to document the ratings.

Remember, search is an emergency. Every incident requires an immediate response to save lives and minimize suffering. An immediate response reduces the size and complexity of the search. For a highly urgent search this immediate response may be applying well-trained, experienced resources to the search area. For a search of low urgency the immediate response may be to continue the investigation and gather more information before committing additional search resources to the field.

In the event that there is more than one missing subject, a single search urgency rating chart is completed based on the worst case situation for each person in the group. This errs on the side of caution and generates a higher urgency rating compared to any individual in the group. The possibility that a group has split should always be considered and investigated.

Table 6.1: Search Urgency Rating Chart[1]

Factors	Rating
AGE OF SUBJECT:	
Very Young	1
Very Old	1
Other	2 – 3
MEDICAL CONDITION OF SUBJECT:	
Known/Suspected injured, ill, or mental problem	1 – 2
Healthy	3
Known fatality	3
NUMBER OF SUBJECTS:	
One alone	1
More than one (unless separated)	2 – 3
SUBJECT EXPERIENCE PROFILE:	
Not experienced, does not know area	1
Not experienced, knows area	1 – 2
Experienced, not familiar with area	2
Experienced, knows area	3
WEATHER PROFILE:	
Past and/or existing hazardous weather	1
Predicted hazardous weather (less than 8 hrs.)	1 – 2
Predicted hazardous weather (more than 8 hrs.)	2
No hazardous weather predicted	3
EQUIPMENT PROFILE	
Inadequate for environment and weather	1
Questionable for environment and weather	1 – 2
Adequate for environment and weather	3
TERRAIN/HAZARDS PROFILE	
Known hazardous terrain or other hazards	1
Few or no hazards	2 – 3
TOTAL: (between 7 and 21)	

TOPIC 7

What are LKP, PLS, and IPP?

The place where the subject was last seen or known to be is either the Place Last Seen (PLS) or the Last Known Position (LKP).

The **PLS**, Place Last Seen, is the location where the missing subject was actually seen by another person.

The **LKP**, Last Known Position, is the last known location of the missing subject determined by physical evidence such as a vehicle, a discarded object, or a footprint.

Initially one of these is the hub of the search, and is called the **IPP**, Initial Planning Point, being the first LKP or PLS that is relevant. Note, as the search progresses, the PLS and LKP can change, whereas the IPP does not. The IPP is important, not only because it is the hub of the search, but also because it is the point from which all statistical data is measured.

If the IPP is a PLS, then include the name of the person who made the sighting together with the date and time last seen and any other information that may be of use, such as the answers to the following questions.

- How did they know it was the missing person?
- What were the circumstances of the sighting?
- What was the missing person's direction of travel?
- What did they have with them?
- What condition did they appear to be in?
- Were they alone?

Note that there may be an element of uncertainty about a PLS. Did the person who made the sighting know the missing person? How close were they? What was the level of visibility?

Because of the importance of the IPP the following suggestions should be observed.

- Protect the IPP from further disturbance by taping it off for the following reasons.[1]
  - It may yield valuable information to a trained tracker, for example, the missing person's footprint, a direction of travel.
  - If a crime is suspected then the IPP needs to be investigated by detectives from a criminal investigations division.
- Do not locate the Incident Command Post directly at the IPP.
- The Incident Commander should visit the IPP in case there is something of significance that others have missed.

Note: If there is no IPP then there is no focus for search operations. Search operations cannot be effectively undertaken until that focus is determined.

[1] If additional PLS's and LKP's are discovered as the search progresses, these too should be protected from further disturbances.

TOPIC 8

What is LPB?

Missing Persons often behave in predictable ways, and what they are likely to do can be predicted by analyzing the behavior of others who were missing under similar circumstances. Lost Person Behavior (LPB) is data organized by category of previously lost persons including how they behaved while they were missing.

Determining the LPB category is an important outcome from the investigation. There are a variety of lost person behavior sources available to be consulted. The best source is local data if available. If local information is not available, there are sources of lost person behavior information included in Win CASIE III. Regardless of which source is used it is a good practice to document the source of the data consulted.[1]

Typically lost subjects are divided into different categories, such as

- Children (1—3)
- Children (4—6)
- Children (7—12)
- Youths (13—15)
- Climbers
- Despondents
- Elderly
- Hikers
- Hunters
- Miscellaneous
- Fishermen
- Skiers
- Walkaways

Then within each category there is data that can be very useful, such as how the subject behaved when lost, how far they were found from the IPP (as the crow flies), and so on.

The LPB category of the subject is an important piece of information. LPB provides general characteristics and distance traveled for many different categories of lost persons. This information is valuable for considering

- The distance that someone like this can travel from the IPP.
- The size of the search area.
- Where to place containment.
- The kind of clues to look for.
- How difficult it will be to detect this person.

LPB data can also inform search strategy and tactics based upon previously observed and documented behaviors for the lost person categories. The strategy and tactics for searching for an autistic child are likely to be different from searching for a hiker. Reviewing the LPB is important

[1] Other sources of data are "The U.K. Missing Person Behaviour Study, March 2011" by Dave Perkins, Pete Roberts, and Ged Feeney available from `http://www.searchresearch.org.uk/www/ukmpbs/report_archive`; and "Lost Person Behavior" by Robert Koester, dbS Publications, 2008, `http://www.dbs-sar.com/LPB/lpb.htm`. A comparison of these data sets can be found in "The ISRID statistics and UK missing person incidents" by Dave Perkins, available from `http://www.saraz.org/documents/ISRID_and_UK_incidents.pdf`.

with the caveat that the person being searched for is not part of the statistical data set yet and may do something entirely different than would have been predicted by the LPB data. Caution should also be exercised when using LPB data that has a small sample size.

Factors Influencing LPB

When looking at LPB data, it is important to recognize that other factors may impact the behavior of the missing subject. These include:

- The subject's general state of health.
- The subject's past experience.
- The circumstances under which the subject went missing.
- The effects of the environment.

The initial reaction when someone realizes they are lost can express itself through:

- Shock and disbelief.
- Irrational or fearful thoughts.
- Embarrassment.
- A heightened sense of urgency.

These factors might influence their behavior, although finally they may overcome their panic and become more purposeful.

Often, after realizing they are lost, they behave in ways that do not help their situation. For example

- They fail to make a shelter or fire.
- They discard equipment.
- They disrobe.
- They fail to respond to searchers.

TOPIC 9

What are Objectives, Strategies, and Tactics?

In the Incident Command System (ICS), see Topic 49 on page 104, incidents are managed under "Management by Objectives". Management by Objectives was developed for managing businesses many years ago, and is commonly used by many corporate, governmental, and other entities. The concept requires that the manager/leader develops specific objectives to achieve their preferred outcome, and provides and explains these objectives to their subordinates. The subordinates, understanding the objectives that need to be accomplished, use their background and expertise to identify and execute the actions/tasks necessary to accomplish those objectives.

Thus it is with search management under the ICS. The Incident Commander sets the Incident Objectives and determines the Strategy that will be used to accomplish them. They delegate the responsibility for developing and implementing the tactics to accomplish those objectives, and hold their subordinate Operations, Planning, and Logistics Section Chiefs (if they exist) accountable. Of course, if the IRIC has not yet delegated Operations, Planning, or Logistics to Section Chiefs, then the IRIC must develop the objectives, strategy, and tactics. It is important that the IRIC understands the difference between Incident Objectives, Strategy, and Tactics.

- **Incident Objectives** are the goals that must be accomplished to successfully resolve the incident.
- **Strategies** are the big picture plans that outline how the Objectives are to be accomplished.
- **Tactics** are the physical and mental tasks that are performed by the incident resources to carry out the Strategies and accomplish the Objectives.

An Example of an Objective, Strategy, and Tactic

An Initial Response Incident Objective: Establish and maintain containment by 1500 hours.

An Initial Response Strategy to accomplish this Objective: Establish containment at the intersection of the Tank 1 and Tank 2 trails by 1500 hours.

An Initial Response Tactic to carry out this Strategy to accomplish this Objective: Team 1 to proceed on foot up Tank 1 trail to intersection of Tank 2 trail by 1500 hours, looking for sign all the way. Set up trail block at junction. Be prepared to maintain for 24 hours.

TOPIC 10

What is Planning and Searching Data?

Planning Data

Planning Data is information that helps the IRIC decide where to look for the missing person. Numerous questions in the LPQ provide useful planning data. For example, the person's place and time last seen is a critical piece of planning data upon which many of the initial response actions are based. Human trackers, air-scenting and tracking dogs, and hasty search teams often start their search at or near the PLS. In addition, the PLS or the LKP becomes the IPP for the remainder of the search, and is the location upon which statistical data for potential distance and direction traveled is based.

Other kinds of planning data include:

- Missing person's trip plans, including intended purpose, routes and destinations.
- Subject(s) outdoor experience or training.
- Barriers to travel, such as rivers, cliffs, fence lines, a dramatic change in vegetation type or impenetrable vegetation.
- Locations within the area that might attract a missing person, such as waterfalls, overlooks, scenic vistas, lakes, and rivers.
- Weather—past, current, and predicted.
- Hazards that might exist within the area such as mine shafts, swift stream or river currents, cliffs and steep terrain.
- Terrain.
- History of prior incidents in the area.
- Other contacts the subject(s) might make.
- Actions undertaken by friends/family or others.
- Search history in the area.
- Effective search techniques for the area.
- Lost Person Behavior information including distance traveled.
- Permits issued by land management or game management agencies.

When investigating permits issued by land management or game management agencies it is important to not only seek out the permit issued to the lost person but also seek out permits for others that would have been in the area at the same time as the lost person. Those other permit holders should be contacted and interviewed to determine if they have any information that would be useful for the search or investigation. All efforts should be made to interview the employee that issued the permit to determine if any advice was given or if any of the conversation between the permittee and the permit issuer would provide clues about the subject's whereabouts.

All of this planning data is analyzed and used to determine the likely spots that might contain the subject or the likely routes the subject might have taken from the IPP. Looking in these places early in the search gives the IRIC the best chance of finding the missing person quickly.

Searching Data

Searching Data is information that helps the searchers in the field find the missing person or identify clues that the missing person may have left as they traveled through the area. Searching data includes such information as:

- Name, age, physical description of the missing person.
- Nickname or name they respond to when called.
- Clothing the missing person was wearing and carrying at the time they were last seen.
- Footwear—make, model and size are critical to identifying the missing person's track among all of the other footprints in the search area.
- Medical and mental condition.
- Items they were carrying such as special equipment (tent, sleeping bag, stove), food, cell phone (get number and cellular carrier), Satellite Emergency Notification Device (SEND) or Personal Locator Beacon (PLB), satellite phone (get number).
- Other items that could become clues during the search.

All searching data should include enough descriptive detail (size, color, brand, quantity) to enable searchers and investigators to confirm whether or not items located in the search area belong to the missing person. Throughout the search, the Investigator should refine the descriptions and the amount of detail about the searching data. This information is provided to all of the search resources.

The initial information collected is often from the reporting party. The Investigator should seek out other persons to interview that have knowledge of the lost person. It is not uncommon for family members to be reluctant to divulge potentially sensitive embarrassing information about the lost person. Other sources such as co-workers, friends, and hiking companions may provide different perspectives about the lost person that are valuable for searching and planning.

TOPIC 11

What is a Missing Person Flyer?

It is important to develop a "Missing Person Flyer" as soon as possible. Then distribute it to the searchers, the media, the public in the area of the search, and post in public places in and around the search area to ensure that everyone is aware that the search is going on, who the missing person is, and what to do if they see or hear anything that might be pertinent to resolving the incident.

Ideally the Missing Person Flyer should contain:

- Pictures of the subject—more than one, in various settings, especially engaged in activities similar to when they went missing.
- Physical description of the subject.
- Clothing worn by the subject when they went missing.
- Equipment carried by the subject when they went missing.
- Synopsis of where and how the incident occurred.
- Instructions to the public as to what to do and who to contact if they have pertinent information.

INFORMATION WANTED
MISSING PERSON

Michael LeMaitre

DOB:	September 25, 1946
Missing	July 4, 2012
Age Now:	65
Sex:	Male
Race:	White
Hair:	Black
Eyes:	Blue
Height:	6' 2"
Weight	212 lbs
Missing	Seward, Alaska
From:	United States

Last seen at: 7/4/12 at 6:00 pm in Seward, AK on Mt. Marathon Race Trail, 200 feet downhill from Race Point, headed up.
Last seen wearing:

- **Black short sleeve shirt**
- **Black running shorts**
- **Red and black lightweight gloves, and black headband**

ANYONE HAVING INFORMATION SHOULD CONTACT
Seward Fire Department
(907) 224-3445
OR
The Alaska State Troopers
(907) 269-5511
OR
The Federal Bureau of Investigation
1-800-225-5324 (1-800-CALL-FBI)

TOPIC 12

What is an Investigative Task Checklist?

The Investigator should be creative in developing sources of information that aid in providing background information about the subject as well as information that assists in locating the subject. A list of investigative tasks was developed by some experienced SAR personnel in Arizona. It is included in Win CASIE III (see Topic 40 on page 85), and is reproduced here.

- *Complete LPQ*
  - *Photo*
  - *DMV/Motor Vehicle Photo and Physical Identifiers/Registered Vehicles*
  - *Local photographic studios and cameras for images*
  - *Internet (Social Sites, GOOGLE™ search engine)*
  - *Footwear Investigation*
  - *Missing in the past/circumstances*
  - *Cash/credit cards on person?*
  - *On medication? If so, name of doctor.*
  - *Leave note/keep diary?*
  - *English speaking?*
  - *Afraid of someone in a uniform?*
  - *Afraid of water?*
- *Complete Missing Person Flyer*
  - *Release to Public*
- *Cell Phone*
  - *Which one?*
  - *Carrier?*
  - *Tracking capability?*
  - *Know how to call home?*
- *GPS/PLB/SEND?*
  - *ID/Provider*
- *Email*
- *Check Public Transportation*
  - *Road: Buses, Coaches, Taxis, Car rental centers*
  - *Rail: Trains*
  - *Air: Aircraft*
  - *Water: Ferries*
  - *Interchanges*

 Acronyms Topics

- *Access to a vehicle, bicycle, horse, boat, airplane, ATV, snowmobile?*
- *Notify Adjacent Agencies*
- *Background/Criminal History of subject*
- *Background/Criminal History of reporting party*
- *NCIC/State Crime Information Center Entry*
- *Offline Search*
- *Financial records*
  - *ATM*
  - *Credit/Debit Cards*
  - *Tax liens*
  - *Video surveillance footage from business*
- *Computer: Home/Work/Library/School*
- *Reverse 911*
- *If subject is child*
  - *Issue Amber alert*
  - *Check SORT (Sex Offender Registration & Tracking System)*
  - *Contact* `http://www.achildismissing.org`
  - *Stop trash pick-up in area so receptacles can be checked easily*
    - *Have landfill separate recently picked up trash from rest of landfill*
    - *If assistance is needed in landfill search, contact National Center for Missing & Exploited Children® (NCMEC)—1-800-THE-LOST®*
  - *The school they attend and the names of teacher and school administrator.*
- *If subject is elderly*
  - *Check for nametag, ankle bracelet transmitter*
  - *Contact* `http://www.achildismissing.org`
- *If subject is disabled, or college student, contact* `http://www.achildismissing.org`
- *If subject is 21 or younger call National Center for Missing & Exploited Children® (NCMEC)*
- *If foul-play is suspected, stop trash pick-up in area so receptacles can be checked easily*
- *Contact Friends/Family/School teachers/Classmates/Business associates/Family physician/Recreation associates*
- *Check Subscription Database, such as Autotrack*
- *Check whether at Facility (if not there leave description of subject, in case admitted later)*
  - *Hospitals*
  - *Mortuaries*
  - *Jails*
  - *Lodgings*
  - *Care centers*
  - *Mental health facilities*
  - *Detox centers*
  - *Battered women's shelters. These facilities may or may not be able to provide information.*
  - *Homeless shelters*
  - *County Protective Services*
  - *Photos/security camera footage of subject at facility*
- *All family pets accounted for?*
  - *What type of pet is missing? Pet's name?*
  - *Could pet pose a threat to searchers?*

TOPIC 13

What is the Difference Between IR and OP 1?

The Initial Response (IR) phase of a search is the period between the time the Initial Response Incident Commander (IRIC) receives the initial report that someone is missing, and the start of the first full operational period. Typically, the Initial Response Incident Commander determines when Operational Period 1 (OP 1) starts and its length, which, in Arizona, is usually 12 hours.

The Initial Response period is usually characterized by use of a few, highly skilled, independent resources searching likely routes and locations. Records are kept on the ICS 201 or Win CASIE III Initial Note. The first Operational Period begins when the IRIC transitions the incident to a new IC and/or Incident Management Team (IMT), and a written Incident Action Plan (IAP) is developed and implemented. The Initial Response phase of a search should last no longer than 16 hours, preferably less, because the IRIC's decision making ability deteriorates with fatigue.

A verbal Incident Action Plan is most common during the initial response phase of the search. If the Route and Location Search extends into the first full operational period, then a written IAP should be developed. For example, if the initial call was received at 1100 hours and the hasty search started at 1200 hours it might continue to 1800 hours. The first full operational period would then be from 1800 hours to 0600 hours. The initial part of the search from 1200 to 1800 hours is the Initial Response and the period from 1800 to 0600 hours is Operational Period 1. See Table 13.1. Both the Initial Response and Operational Period 1 are likely to be a Route and Location Search.

Table 13.1: Example Operational Periods

Time	Length (hr)	OP
1200–1800	6	Initial Response (IR)
1800–0600	12	1
0600–1800	12	2
1800–0600	12	3
⋮	⋮	⋮

TOPIC 14

What is Passive Searching?

There are two different modes of searching, Passive and Active.[1] **Passive Searching** is where the searchers let the lost person come to them, for example a road block, or a resource placed at a high point with good visibility to constantly scan the terrain (a lookout). **Active Searching** is where the lost person is actively sought by resources committed by the incident management team, for example a hasty team. Both modes can be used simultaneously. This topic deals with Passive Searching of which there are two main tactics, Containment[2] and Attraction.

The purpose of **Containment** is to keep the lost subject within a specific area, and, if that fails, to know whether they have left the area. It assumes that the subject is Mobile.

The purpose of **Attraction** is to catch the attention of the lost subject causing them to either respond or walk out on their own. This is done by searchers producing some form of visible or audible signal. It assumes that the subject is Responsive.

Containment

In containment, the Incident Commander tries to create a ring of searchers around the area containing the subject, so that the subject cannot leave that area without being detected, thereby lessening the chances that the search area needs enlarging. However, creating a ring of searchers is not always possible for various reasons: lack of resources, difficult terrain, and problems transporting searchers to their assigned spots. Nevertheless, even containment on one or two sides limits the area that needs to be searched. Also, some containment techniques might be used within the search area, not just on the perimeter.

According to Tim Setnicka, containment "*requires an emergency response rushing some rescuers off while the data gathering and planning phases commence and continue.*"

Physical Containment includes the use of

- **Trail Blocks**. These are resources placed at trail junctions or choke points (narrow routes from one region to another, such as a bridge or a mountain pass), and are staffed constantly. Trail blocks serve several purposes.
  - To locate the subject if they find and follow the trail to the trail block.
  - To interview possible witnesses and to gather information on conditions in the search area. The fact that someone hiking in the search area did not see anything is important information

[1] Sometimes these are referred to as Indirect and Direct modes of searching.

[2] Containment is sometimes called Confinement, although that has different overtones in the law enforcement community.

 Acronyms Topics

for search planners to know—knowing where the subject is not is a step to finding where the subject is. It is common to try to record the names of people both entering and leaving the search area. Also people entering the area are made aware of the missing subject and can become an asset to the search effort.

- **Road Blocks**. Road blocks are established and staffed by law enforcement. They intercept all traffic entering and leaving the search area. It is common to record the license numbers of all vehicles. Road blocks serve several purposes.
  - To prevent the missing person from emerging on a road and leaving the search area without realizing they are the subject of a search.
  - To inform those entering the area of the missing subject so they can then become assets to the search effort.
  - Road blocks might include voluntary vehicle searches, especially in the case of a missing child.
- **Road Patrols**. A road patrol usually consists of a single- or two-person vehicle driving back and forth between two points on an established road. A road patrol has elements of both containment and search.
- **Track Traps**. These are natural or man-made traps that are used in areas of constricted passage, typically on trails or roads. They are designed to capture evidence of the lost person passing through the area. They can be made in dry washes, sand, mud, snow, plowed fields, power line areas, etc., by smoothing the area so that it is clear of tracks. Track traps are not staffed, but are checked periodically.
- **String Lines**. String lines are infrequently used in dense woods or brushy areas. This string is marked with tags, each placed frequently enough to be visible to the lost person who locates the string. These tags give directions and distances to safety. String lines are not staffed, but are checked periodically. Broken string lines may indicate the subject's presence and direction of travel. Although effective, this technique is seldom used. It requires much manpower, equipment, and time.
- **Lookouts**. A lookout is an elevated place giving a wide view for observation.
- **Camp-ins**. A camp-in refers to any of the containment techniques where searchers are stationed on a full-time basis.

Ideally all physical containments are carried out by a team of two persons, although, if resources are scarce, a single person might be assigned to do containment at a trailhead or to act as a radio relay.

Physical Containment is vital in searches involving subjects on foot, but may be impractical in searches for subjects on motorized vehicles, such as snowmobiles and ATVs, due to the enormous size of the possible search area.

Containment is a simple task that most people can do. However, teams need to be certain that the subject does not pass them without being detected. So they must stay focused even though they may experience many hours of boredom.

Some personnel dislike a containment assignment so it is important to stress its importance, and to point out that many times it is containment that "catches" the subject. Even so, it is wise to try to match tasks with an individual's capabilities.

If there are insufficient personnel to do the containment then consider tapping into non-SAR resources, such as Sheriff's Office Patrol Volunteers or volunteer Community Emergency Response Teams (CERT). They require specific briefings detailing what to do and what information to collect. Although these personnel are generally not SAR trained and SAR does not fall within their normal duties, they are organized and recognized.

People assigned to a containment team are sometimes given additional tasks such as communication relay, weather spotter, and search team transportation.

While these physical containments are being deployed, virtual containments should also be considered. These are designed to eliminate the possibility that the subject was able to leave the search area. Virtual Containment includes

- Placing posters or signs at strategic locations such as trail heads, convenience centers, and other identified areas specific to the search.
- Periodically calling or texting the subject's cell phone, home phone, and voice mail to leave directions on what actions to take upon receipt.
- Leaving notes on cars or residences. If the subject lives alone, leave a note at their home saying that there is a search in progress for them.
- Checking with transportation companies.
- Checking with hospitals or jails, etc.
- Advising the media.

Attraction

Attraction—a tactic used by search teams to help locate the subject by drawing attention to themselves—goes hand-in-hand with containment. Whereas containment usually deals with putting resources on the boundary of the search area, attraction does not necessarily do that.

Attraction includes the use of

- **Calling the subject's name**. Silence must be kept for 10–30 seconds between calls in order to listen for a response. Previously identified "holler points" can be used. However, there are situations where one member of a team heard the subject responding while the other did not. Some searchers may be unaware that they have hearing loss.
- **Loud Sounds**. Whistles, horns, sirens, gunshots, public address (PA), etc. These may be heard over a considerable distance. Lost subjects may proceed to the sound if it is repeated or they may simply respond. Stationary sound attraction should be used in conjunction with a visual homing signal (for example, a flare) to give the lost subject a better sense of direction. Also the loud sound attraction points need to be stationary for long periods of time. It is frustrating for a subject to hear sounds being used for attraction and then start walking to it only for it to move every 15 minutes or so.

  However, sounds should not be used to attract subjects across dangerous terrain, especially at night. Also loud sounds may be frightening to children and mentally-challenged individuals.
- **Visual Beacons (Daylight)**. Smoke, signal panels, reflectors, etc.
- **Visual Beacons (Night)**. Lights, fires, flares, etc.
- **Aerial Attractions**. Helicopters, fixed-wing aircraft, balloons, search lights/emergency lights.

TOPIC 15

What is Situation Awareness?

Situational Awareness is the ability to continuously analyze information coming in and constantly update your mental model of the situation. This is a critical skill for emergency responders. Many times responders get initial incident information from Dispatch and begin to formulate a plan to deal with the incident based on that information only to find a different situation when responders arrive on scene. It is crucial that responders are able to recognize that the conditions have changed from the initial impression and compensate for those changes.

A lack of situational awareness has been cited in many accidents as a contributing factor. Under stress it is sometimes hard to take in new information, analyze it, and update the mental image of the conditions. See Figure 15.1 and Figure 15.2. The three images are of the same vehicle.

Figure 15.1: Lack of Situation Awareness

The following are some actions that prevent the loss of situational awareness.

- Actively question and evaluate the mission progress.
- Analyze the situation.
- Update and revise the image of the mission.
- Use assertive behaviors when necessary:
  - Make suggestions.
  - Provide relevant information without being asked.
  - Ask questions as necessary.

- Confront ambiguities.
- State opinion on decisions/procedures.
- Refuse unreasonable requests. IT'S OKAY TO SAY NO!

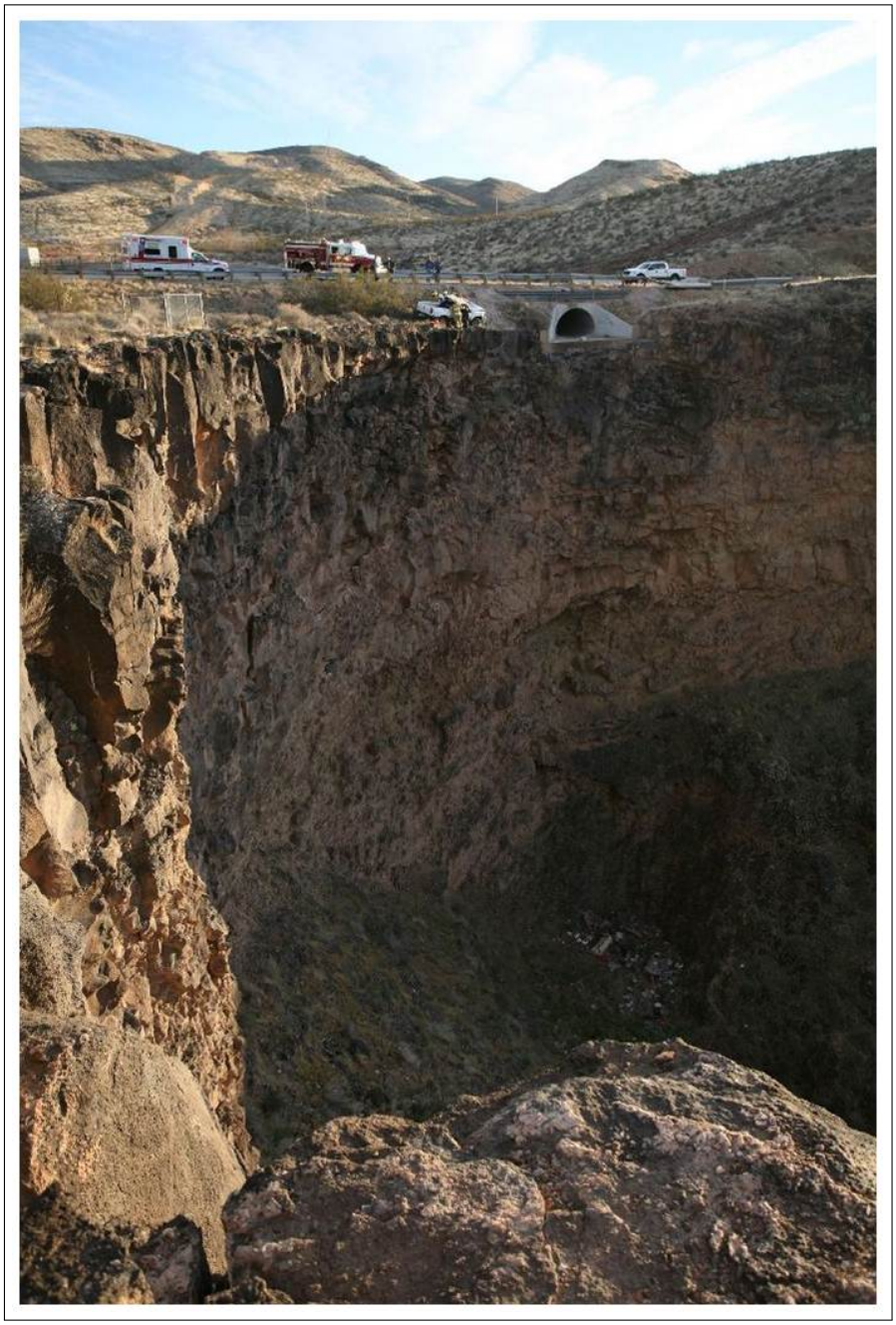


Figure 15.2: Lack of Situation Awareness

TOPIC 16

What is GAR?

The GAR (Green, Amber, Red) Risk Assessment Model is a powerful "Go"–"No Go" decision tool that incorporates the opinions of several personnel involved.

Using the GAR model the respondents independently assign a risk score between 1 (no risk) and 10 (maximum risk) to eight different elements.

1. **Supervision.** The presence of qualified, accessible and effective supervision on the incident. A clear chain of command is in place.
2. **Planning.** Adequate incident information is available and clear. There is sufficient time to plan, operational guidelines are current, briefing of personnel is being conducted, and team input solicited.
3. **Contingency Resources.** Backup resources that can assist if needed. Evaluate shared communications plan and frequencies. Has an alternative plan been evaluated?
4. **Communication.** Evaluate how well personnel are briefed and communicating. How effective is communication system and is there is an established communication plan? Does the operational environment value input?
5. **Team Selection.** Team selection should consider the qualifications and experience level of the individuals. Consider the experience for the mission being performed.
6. **Team Fitness.** Consider physical and mental state of the crew. Evaluate team morale and any distractions.
7. **Environment.** Consider factors affecting performance of personnel and equipment such as time, temperature, precipitation, topography, and altitude. Evaluate site factors such as narrow canyons, forest canopy, technical terrain, snow, swiftwater, etc.
8. **Incident Complexity.** Evaluate severity, exposure time, and probability of mishap. Assess difficulty of the mission and proficiency of personnel.

The scores are summed and then compared to the GAR Risk Assessment Table. A comparison of each individual's GAR score should be conducted to see where the majority of the scores fall in the GAR Risk Assessment Table, Table 16.1.

Table 16.1: GAR Risk Assessment Table

1–35	36–60	61–80
GREEN Go—Proceed With Mission	AMBER Caution—Mitigate Hazards Before Proceeding	RED NO GO—Stop. Do Not Proceed With Mission

 Acronyms Topics

TOPIC 17

What is Briefing?

In search incidents the Incident Commander and staff have a plan that needs to be executed. The plan is executed by the available search personnel on scene. As such, those personnel need to be adequately briefed about the plan and how it is to be implemented. A quality briefing sets the tone for the operation and instills confidence in the IMT on the part of the searchers.

In some situations it is acceptable to brief all searchers together, especially if it is a relatively small incident and there is a relatively small number of searchers. If there is a large number of searchers on the scene it makes more sense to brief the team leaders and then have those team leaders brief their teams.

Briefing Resources Checklist

1. Incident summary, including:
   a) Incident history.
   b) Missing person profile and photo.
   c) Map showing IPP and current assignment.
   d) Navigation information (map datum, coordinates, true or magnetic north).
   e) Actions to date.
   f) Clues found.
   g) Terrain.
   h) Weather.
   i) Hazards and safety, including possible illegal activity.
   j) Possible media presence.
   k) Possible family presence.
   l) Actions to take if the subject is found.
   m) Language to use if the subject is found.
   n) Rescue and medical plans.
2. Assignment details.[1]
   a) Where to go, what to do, and what to document.
   b) Type of clues to look for. Review protocol for handling evidence.
   c) Document everything on an ICS 214 Activity Log form. See Figure 47.1.
   d) During the mission, photos taken of the subject—that can identify that subject—should not be distributed without the approval of the SAR coordinator and/or the subject.
3. Interviewing people in the field.
4. Type of subject to base tactics on. Mobile or immobile. Responsive or unresponsive.
5. Transport to and from their assignment.

[1] During the initial response phase assignments are often given verbally and recorded by the IC on an ICS 201 or in Win CASIE III. After that they are written on ICS 204 forms.

 Acronyms Topics

6. Personal equipment to take.
7. Team equipment to take.
8. Communications.
9. Debriefing.
    a) Where to return to.
    b) Who to talk to.
    c) What questions will be asked.

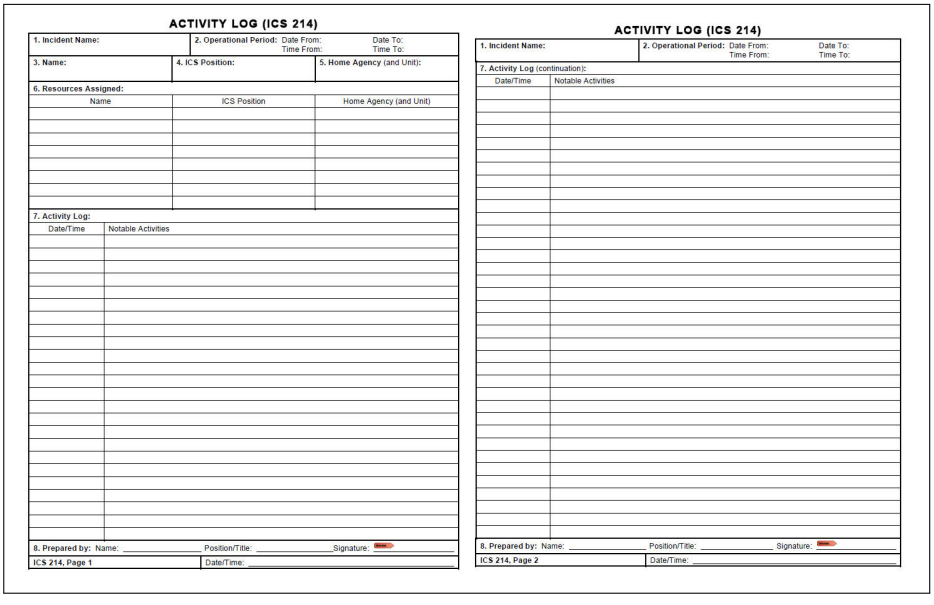
Leader's Intent

Leaders Intent involves communicating the Task (what is to be done), the Purpose (why it is to be done), and the End State (how it should look when it is done). The objective is to establish a common operating picture so that all components of an operation understand how they fit in to the mission. This can be done

1. At a high level. *Task and Purpose:* SAR will respond to the report of an overdue person and conduct an efficient and effective operation as that is our mission and responsibility. *End State:* When the operation is over the subject will have been located and returned to a place of safety and all responders will be accounted for.
2. At a tactical level. *Task and Purpose:* Containment will be established by 1500 hours to prevent the expansion of the search area or detect the movement of the subject. *End State:* When effective containment is in place the movement of the subject will be able to be detected and the search area will not expand.

When all personnel understand the leader's intent it will help them to make decisions in the field that support the overall operation because they realize the importance of their task. Without that understanding when personnel encounter a roadblock to the completion of their task they may not take action or make decisions to overcome that roadblock because they do not understand why their task is important to the overall success of the mission.

Documentation It is important to remind search personnel to document their activities and to be prepared to debrief once the assignment is complete. This can include completing an ICS 214 Activity Log (see Topic 47 on page 100), keeping a GPS on to develop a track log for download, or making notations and shading on the map so that accurate information about what has been searched and how well it has been searched can be verified.


ACTIVITY LOG (ICS 214)

1. Incident Name: | 2. Operational Period: Date From: Time From: Date To: Time To:

3. Name: | 4. ICS Position: | 5. Home Agency (and Unit):

6. Resources Assigned:

Name	ICS Position	Home Agency (and Unit)

7. Activity Log:

Date/Time	Notable Activities

8. Prepared by: Name: Position/Title: Signature:

ICS 214, Page 1 | Date/Time:

ACTIVITY LOG (ICS 214)

1. Incident Name: | 2. Operational Period: Date From: Time From: Date To: Time To:

7. Activity Log (continuation):

Date/Time	Notable Activities

8. Prepared by: Name: Position/Title: Signature:

ICS 214, Page 2 | Date/Time:

Figure 17.1: ICS 214

TOPIC 18

What is a Hasty Search?

The hasty search is one of the initial actions following the preliminary report, the investigation and consequences of that report, and the containment of the search area. During the hasty search, trained SAR personnel are deployed to search routes and locations that are deemed high probability areas in which to locate the lost person or clues. It is important to note that **the term 'hasty' does not denote a search that is thoughtless or careless**, rather it is meant to denote a search that is initiated with highly qualified personnel relatively quickly after the initial report is made.

There are often "SAR hotspots" where searches are commonplace. For those hotspots it is wise to develop specific search pre-plans based on search history at that location. These pre-plans might include items such as area maps, information about confusing trail junctions, historical find locations, likely attraction points, effective resources and techniques for that area, combinations for locked gates in the area, contact information for land managers, and a list of technical experts that may be of assistance in those areas.

During the hasty search it is assumed that the subject may be mobile in the search area, however the subject may or may not be responsive. Appropriate tactics for the hasty search should be selected based on a review of the initial investigation, lost person behavior data, and an analysis of the terrain, weather, and any other environmental conditions.

There may be cases where a hasty search is appropriate but SAR volunteer resources should not be used or used with caution such as situations involving suicidal subjects, subjects with active warrants, criminal suspects including those where a second party is involved who is not involved in the criminal activity (kidnapping, AMBER alert, etc.). Hasty search strategy and tactics can be used in these cases but careful selection of the appropriate resource is critical after evaluating the nature of the incident.

Ideally hasty search teams

- Consist of 2 or 3 trained search personnel.[1]
- Have an identified team leader.
- Have a knowledge of the search area.
- Are self-sufficient and well-equipped.
- Have a member with EMS training.

Hasty search teams often are assigned to search those routes and locations with a high probability of containing the subject or clues, such as

[1] If, during the initial response, teams consist of more than 3 members assigned to "clear" an area, then this is a tactic of an area search, not a route and location search. It assumes the subject is stationary. There is little point in "clearing" an area if the subject is mobile and could later enter the "cleared" area.

 Acronyms Topics

- Initial Planning Point (PLS or LKP).
- Known or suspected route of the subject.
- Travel aids such as
  - Roads.
  - Trails (paying attention to trail sign-in registers both for the search subject and for potential witnesses that need to be interviewed).
  - Ridge lines.
  - Drainages, river banks, lake shores, dry washes.
  - Utility corridors.
  - Fence lines.
  - Railroad tracks.
- Known attractions such as
  - Buildings.
  - Cultural or natural features.
- Areas of known hazard such as
  - Abandoned mines.
  - Wells.
  - Caves.
  - Cliffs.
  - Construction areas.
  - Open drains.
  - Exposed septic tanks/systems.

While conducting searches in these high probability areas, the hasty search teams should consider utilizing the appropriate search tactics based upon an evaluation of the conditions and the lost person behavior data.

- Some subjects, while legitimately lost, may not recognize that they are lost and therefore may not be considered cooperative subjects, such as small children and dementia patients.
- Some subjects may not want to be found by searchers but use searchers as a way to reorient themselves and self-rescue.
- Some subjects may be wary of contact with authorities as they may believe they are in trouble or will be billed for the cost of the search.
- Some subjects may have impairment of some senses such as hearing or sight.

All of these issues affect the tactics used to locate the subject.

Several common search tactics used in a hasty search are

- Verbal attraction (calling the subject's name and using whistles).
- Visual attraction (wearing bright colored clothing, using light sources).
- Sign cutting along travel aids, routes, and the perimeter of the initial search area.
- The use of SAR K9s.
- The use of Mounted SAR units.
- The knowledge and use of a Safety Code Word[2] for children.
- The use of specialized vehicles (ATVs, UTVs, Boats, Mountain Bikes, 4WD vehicles).
- The use of search aircraft.
- The use of specialized optics (spotting scopes, night vision optics, thermal imaging, FLIR).

[2] A code word system designed to protect children from being lured into an unsafe situation by a stranger.

TOPIC 19

What is Debriefing?

Just as important as telling the searchers what they need to do with a briefing, is knowing what they have done. The process of gleaning the information from the searchers after their assignment has been completed is called debriefing. During the debriefing process many critical items are learned such as the area covered and how well it was covered, the hazards in the area, the communications difficulties, and suggestions for future efforts in that area.

Debriefing is a task that is carried out by an experienced searcher or incident management team member, so that the critical information is collected. It should take place in a relatively quiet location mostly free of distractions, out of sight and earshot of media and family. The debriefer sits down with the team leader and discusses the assignment that was just completed. This debriefing should be documented and any relevant materials collected from the team leader such as the team's map with all notations, and any ICS 214 Activity Logs (see Topic 47 on page 100). If the team was using GPS in a tracking capacity, then the track log should be downloaded. If possible witnesses were interviewed during their assignment then this should be reviewed. If clues were located during the search then those should be discussed and if collected they should be turned in during the debriefing. If relevant photographs were taken then those should also be shared with the debriefer.

Debriefing Resources Checklist

1. Who was involved in the debriefing?
2. What was their assignment?
3. What time did they begin?
4. What did they accomplish?
5. Was the assignment/segment completed?
6. What is the Probability of Detection for the resource on the assignment?
7. What time did they finish?
8. Any difficulties or areas they could not search adequately?
9. Any clues found?
   a) Where?
   b) What?
   c) What did they do?
   d) Where is it now?
10. Any hazards observed in the area?
11. Any communications problems?
12. Any comments? For example, what would the team suggest if this task was done again: type of resource, how to search.

A useful form for recording debriefing information is the ICS 204B SAR Debriefing Form. Once completed this needs to be included as part of the incident documentation.

SEARCH AND RESCUE DEBRIEFING FORM
(ICS 204 SAR Supplement B)

INCIDENT NAME: _____

DATE:	**TEAM #**	**ASSIGNMENT #**	**OP. PERIOD**

STATE RESOURCE TYPE AND TACTICS UTILIZED:

STATE EXPLICIT COVERAGE OF THE AREA SEARCHED:

STATE CLUES LOCATED, EVENTS, HAZARDS AND IDENTIFY ALL ON AN ATTACHED MAP:

COMMUNICATIONS ISSUES:

RECOMMENDATION FOR FUTURE EFFORT:

SEGMENT SPLITTING

IDENTIFY AREAS THAT WERE NOT THOROUGHLY SEARCHED OR SEARCHED WITH DIFFERENT POD'S THAT NEED TO BE SPLIT.

THE PLANS SECTION WILL ASSIGN A NUMBER TO THE SPLIT SEGMENTS. AS THE TACTICAL TEAM LEADER YOU MUST ACCURATELY DEPICT BOUDARIES.

ARE YOU SPLITTING YOUR SEGMENT? _____
HAVE YOU IDENTIFIED SEGMENT BOUNDARIES TO THE PLANS SECTION? _____
HAVE YOU DRAWN YOUR COVERAGE ON AN ATTACHED MAP? _____

STATE ESTIMATED COVERAGE OR POD FOR EACH SEGMENT SEARCHED DURING THE ASSIGNMENT. BE SURE TO IDENTIFY THE SEGMENT BY NUMBER.

SEGMENT NUMBER	LIVE RESPONSIVE	NON-RESPONSIVE	CLANDESTINE GRAVE SITE	FOOTPRINT	_____	_____

SIGNED TEAM LEADER: _____ **DATE:** _____

Figure 19.1: ICS 204B SAR Debriefing Form

The results of the debriefing shapes future search efforts and may alter tactics. The searchers in the field are really the eyes and ears of the Incident Management Team. While the incident management team can look at the map, at GOOGLE Earth^{TM}, and other imagery there is no substitute for actual close-up and on-the-ground observations about the search area. The potential for the search area to retain foot tracks and other search clues cannot be determined by looking at maps or imagery. Searchers should take the debriefing session seriously as it has tremendous potential to enhance search operations and provide a better understanding of what is happening on the ground.

Caution should be exercised when debriefing a relatively inexperienced team leader as there is the tendency to not want to disappoint the incident management staff. An inexperienced team leader may be reluctant to state that the assignment was not fully completed or address any other problems encountered during the search. It is important that the debriefer set the proper tone and explain that the point of the debriefing is to gather the information that resulted from the assignment and that this is not a competition. Honest appraisals of what the team was able to

accomplish are most important. After all, the goal of the operation is to locate a lost person not to see who can cover the most assignments in the shortest period of time.

When discussing the Probability of Detection (POD) (see Topic 33 on page 72) during the debriefing interview it is helpful to remind the personnel being debriefed what that means. It has been observed that some teams thought the POD was a measure of how much of the segment was searched rather than the probability of finding the search subject if they were in that segment. When debriefing, the debriefer should not ask leading questions such as "Was your POD 40% or 50%?".

It is important to determine whether or not the entire assigned segment was searched. If the segment was not completed a POD provided by the team is only valid for the region actually searched and not the entire segment. Splitting the segment is a possibility so that the POD for the region searched can be input into Win CASIE III.

Inexperienced teams may overestimate their POD's. The debriefer should be mindful of this and probe further with additional questions to gauge the effectiveness of the search. The debriefer may elect to revise the teams stated POD based on the totality of the debriefing interview and personal knowledge of the assignment and the conditions in the search segment. The POD values are entered into Win CASIE III in order to update the POA's and it is critical that any over-estimations be corrected by this stage so that segments are not discounted during future operational periods because of earlier inflated POD's.

TOPIC 20

What are the SAR Map Symbols?

Figures 20.1 and 20.2 show the "Incident Command System Map Display Symbology For Land SAR Missions" (suggested for placement on a base map), which were developed by Mark Pennington, VA DE; revised by Paul Anderson, Jim Stumpf, and Steve Foster; adopted by NASAR; and approved in *ASTM F1846 Standard Practice for Symbols and Markings for Use With Land Search Maps.*

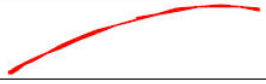
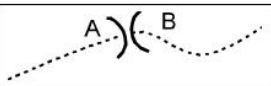
Color used (RED)		PLS, LKP OR IPP (Indicate which and include date and time)
Color used (RED)		CLUE FOUND (Indicate number and location with UTM coordinates)
Color used (BLUE)		INCIDENT COMMAND POST
Color used (BLUE)		INCIDENT BASE
Color used (BLUE)		STAGING
Color used (BLUE)		CAMPS (Identify by name)
Color used (BLUE)		REPEATER OR MOBILE RADIO RELAY (Identify by number)
Color used (BLUE)		HELIBASE
Color used (BLUE)		HELISPOT (Indicate number and location with UTM Coordinates)
Color used (RED)		PLANNED SEARCH AREA BOUNDRY

Figure 20.1: Standard Search and Rescue map symbols, Part 1

Color used (BLUE)		THEORETICAL SEARCH AREA
Color used (BLUE)		STATISTICAL SEARCH AREA WITH POA
Color used (BLACK)		TRAVEL BARRIER
Color used (BLACK)		DIVISION BOUNDARY (Indicate by letter)
Color used (BLACK)		SEGMENT BOUNDARY (Indicate by number)

SUGGESTED FOR PLACEMENT ON OVERLAYS

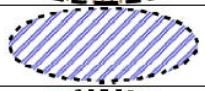
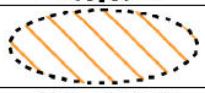
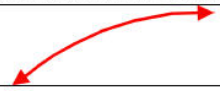
COLOR BASED ON TYPE OF RESOURCE MARKINGS BUILD ON EACH PREVIOUS LAYER		FIRST SEARCH COVERAGE
		SECOND SEARCH COVERAGE
		THIRD SEARCH COVERAGE
		FOURTH SEARCH COVERAGE
Colors used for above searches	DOG - BROWN GROUND CREW - GREEN AIR SEARCHES - BLUE	BOAT – ORANGE
Color used (RED)		CONFINEMENT BOUNDRY OR SEARCH PATROL
Color used (BLACK)	DOG # 2, CREW # 3, TF # 4, ST # 1, PATROL # 5	RESOURCE DESIGNATOR

Figure 20.2: Standard Search and Rescue map symbols, Part 2

TOPIC 21

What is the Anatomy of an Initial Response Search?

The following is a sequence of steps designed to manage the Initial Response phase of a search.

1. Identify the IRIC.
2. Take the initial report. (See Topic 4 on page 15.)
3. Check in with Agency Dispatcher and on ICS 201.
4. Take command of the incident, designate an Incident Command Post (ICP), and announce this to all participants.
5. Document everything using Win CASIE III Initial Note or the ICS 201 form, or both.
6. Gather additional information using a Lost Person Questionnaire, (LPQ). (See Topic 5 on page 16.)
7. Appoint an investigator to continue the investigation.
8. Determine Search Urgency. (See Topic 6 on page 19.)
9. Review Lost Person Behavior. (See Topic 8 on page 22.)
10. Size up the situation from all the information.
11. Develop an appropriate response, including
    a) Create Initial Incident Objectives.
    b) Develop Initial Response Strategy. Identify alternative scenarios. Be sure to include appropriate containment, as well as locating and protecting the PLS/IPP, and determining a direction of travel.
12. Identify Likely Spots and Routes the subject might have taken.
13. Designate Staging Areas. Notify all responders of location and mark ICP and Staging Areas on the map.
14. Order the necessary resources, and begin tracking them.
15. Prepare and distribute a Missing Person Flyer. (See Topic 11 on page 27.) Put out BOLO and/or ATL.
16. Brief and assign the resources,
17. Communicate incident actions to the agency dispatcher as appropriate.
18. Monitor and direct tactical operations.
19. Deal with the family and media as needed.
20. Begin planning for the next operational period (OP) and the required transition to an expanded IMT.
21. Debrief tactical resources, and document significant events and actions.

22. Evaluate the success of the Initial Response efforts.
23. Brief the incoming IC and/or IMT.

 Acronyms Topics

TOPIC 22

What are Clues?

Although there may be only one subject of a search, that subject is constantly generating clues. Documenting, investigating, and authenticating the clues is a critical task.

The absence of clues in the area of a search is also a clue in itself. A distinct absence of clues may indicate the need to reevaluate the initial information and the location of the search for the missing person.

The location of clues and their pattern in conjunction with terrain analysis can provide important search tactic information. Searchers, especially hasty teams, should be clue aware so that important clues in the field are not overlooked. While in most cases search incidents are not related to criminal activity that does occur. The clues found during a search that are important to the search can also be evidence in a criminal investigation.

Clues come in a variety of forms:

1. **Physical** clues include foot tracks, a blood trail, an abandoned vehicle, a campsite, dropped clothing or equipment, a candy wrapper, a note, a dog alert, a trailhead register, ...
2. **Electronic** clues include cell phone data, email, web site visits, other computer forensic information, satellite emergency notification devices (SEND) information, other emergency beacons, permit information, ...
3. **Witness** reports are also very important clues and should be evaluated by a trained interviewer. If the family or witnesses do not speak English as a first language, it is important to use an interpreter to prevent misunderstandings and miscommunication of critical information.
4. **Investigative** information can also be considered clues and include use-permit information from a land management agency, financial information, criminal history, law enforcement database information, medical history, ...

Once a clue is discovered by a searcher a decision must be made as to how to handle the clue. At a minimum the location, preferably GPS derived, should be relayed to the incident command so that it can be placed on a map. The location should also be flagged with the date, time, type of clue, and the name of the team that found it written on the flagging tape. The team should also photograph the clue. Because of the increased popularity of cell phones with integrated cameras, it is possible for the team to photograph the clue and send that photo to the incident command. Depending on the nature of the clue the team may be asked to collect the clue and bring it in, or they may be asked to leave it in place for an investigator to examine and/or collect the clue. Some clues may have value for the collection of biological (DNA) or fingerprint evidence and so need to be handled with care to preserve that material.

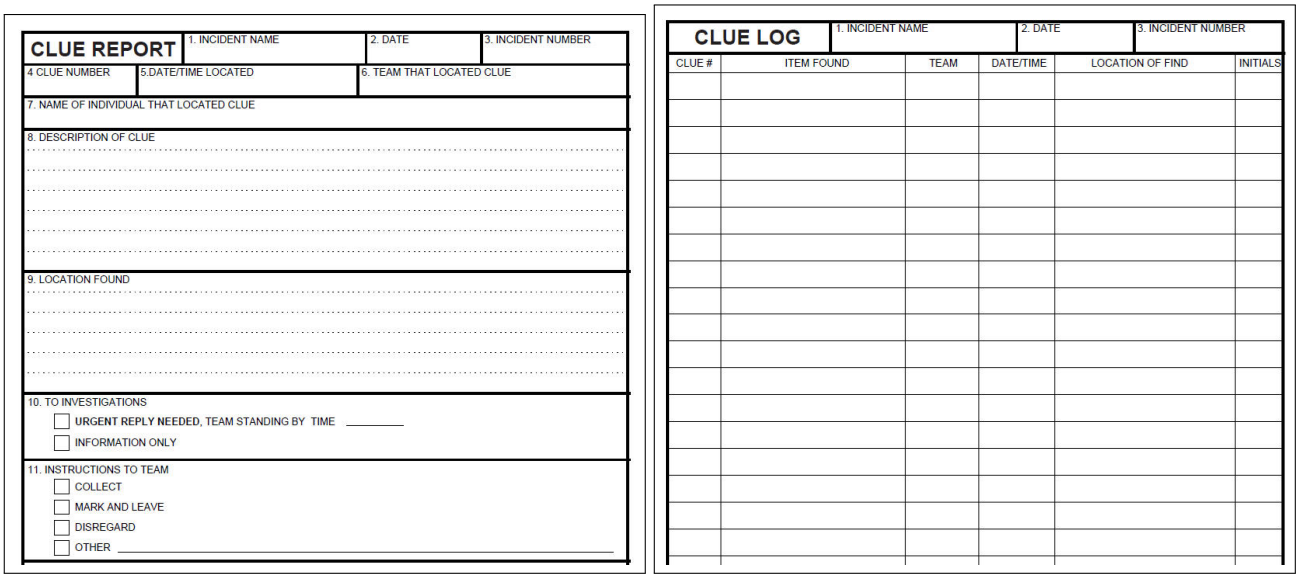
 Acronyms Topics

Searchers are likely to find many clues during a search. Some of those clues can be ruled out quickly. For example, a search subject who has been missing for 12 hours may be known to drink a particular brand of soda. If a team finds a soda can of that variety, but it is sun-faded and filled with dirt, then it is unlikely that the can is related to the subject. Other clues may be fresh and not have specific identifying information. Those clues require more work to authenticate.

Some clues have specific information that allows relatively easy authentication such as a prescription bottle in the subject's name, a receipt containing credit card numbers, or a trail register signed by the subject. Some clues, such as foot tracks, quickly degrade with time and weather. Those types of clues need to be protected from further decay so that they can be processed and properly documented. If a team or individual is in doubt about a clue it should be reported so that the incident managers can make the decision. If possible, assigning a dedicated investigator to handle the investigation and authentication of clues can be of great help because some clues, once investigated, lead to more questions and additional clues.

Keep in mind that if a search clue becomes a piece of evidence in a criminal investigation then the person who found it may be called to testify in court. Good documentation of the circumstances surrounding locating the clue is essential. In the field a searcher should make notes on the ICS 214 Activity Log and that Activity Log should be turned in to the Incident Management Team for inclusion in the incident file.

Clues, once reported, are generally documented individually on a Clue Report form and then entered collectively on a Clue Log form by the IMT. See Figure 22.1.[1]



CLUE REPORT

1. INCIDENT NAME | 2. DATE | 3. INCIDENT NUMBER

4 CLUE NUMBER | 5.DATE/TIME LOCATED | 6. TEAM THAT LOCATED CLUE

7. NAME OF INDIVIDUAL THAT LOCATED CLUE

8. DESCRIPTION OF CLUE

9. LOCATION FOUND

10. TO INVESTIGATIONS

- ☐ URGENT REPLY NEEDED, TEAM STANDING BY TIME _____
- ☐ INFORMATION ONLY

11. INSTRUCTIONS TO TEAM

- ☐ COLLECT
- ☐ MARK AND LEAVE
- ☐ DISREGARD
- ☐ OTHER _____

CLUE LOG

1. INCIDENT NAME | 2. DATE | 3. INCIDENT NUMBER

CLUE #	ITEM FOUND	TEAM	DATE/TIME	LOCATION OF FIND	INITIALS

Figure 22.1: Clue Report and Clue Log forms

One concern with clue forms is that there may be many clues developed and, if there is no good accounting system in place, then a clue may be overlooked or lost. Each clue could be the clue that cracks the case, so investigating every clue is important. Large searches, such as the Fossett Aircraft search, generated thousands of clues and it was a challenge to manage all that information.

[1] These forms, available in Win CASIE III, were designed by the Bay Area Search and Rescue Council (`www.basarc.org`).

TOPIC 23

What is the State of a Subject?

A missing subject may be thought of as in one of four states during the search. See Table 23.1.

- **Mobile and responsive.** Mobile means that the subject can move around, although they may not be moving at the present time. Responsive means that the subject has the ability and the willingness to signal the searchers in some way (voice, whistle, waving arms, mirror, etc.). An example of this is a healthy person who has merely lost the trail.
- **Mobile and unresponsive.** Unresponsive means that the subject cannot or will not signal the searchers in any way. An example of this is a healthy child who has been taught not to talk to strangers.
- **Immobile and responsive.** Immobile means that the subject cannot move around. They are stationary (standing still, not moving). An example of this is a person who has broken an ankle, but is conscious and able to communicate.
- **Immobile and unresponsive.** An example of this is a person who is in a coma or deceased.

The subject may be in one of these states permanently or temporarily. Permanently could be if the subject is in a coma or is deceased. Temporarily could be if the subject is sitting down or is asleep one moment and awake the next. However, in SAR, the temporary situations are discounted, and the search strategy is based on the predominant state the subject is most likely to be in (bearing in mind that, as the search progresses a subject may transition from "Mobile and responsive" to "Immobile and unresponsive".)

Table 23.1: Missing Subject State

	Responsive	Unresponsive
Mobile		
Immobile		

A subject could be intentionally unresponsive, that is evasive, or unintentionally unresponsive. Examples of intentionally unresponsive subjects are

- A child who does not to talk to strangers.
- A despondent who wants to get away from people and does not want to be found.
- A criminal who is fleeing.

An example of an unintentionally unresponsive subject is someone who is unaware that they are the subject of a search, such as a dementia patient.

Knowing whether a subject is mobile or immobile, and responsive or unresponsive, impacts the tactics used during the search.

For example, if, on the one hand, it is believed that the subject is mobile, then rapidly placing resources at strategic locations to contain the subject is a high priority because it restricts the size of the subsequent search area. If, on the other hand, it is believed that the subject is immobile, then that priority is lower, and now the mission of these resources is to talk to passers-by to see whether they have important information.

In the same way, if a subject is mobile, then laying down "traps" that capture evidence of the subject passing is an excellent tactic, which is not sensible if the subject is immobile.

If the subject is responsive, then shouting, lighting flares, etc., is good practice, whereas that is not the case if the subject is unresponsive. An unresponsive subject requires more searchers closer together.

Some Incident Commanders have experienced a search where a subject that has been immobile for days suddenly, for whatever reason, becomes mobile. The thought of this mobility reoccurring and its effect on containment should be present in the mind set of every Incident Commander. This can lend itself to locating more clues and possibly an easier subject to find. However, on a multi-operational period search there are probably weather- or time-related issues that have destroyed clues and thus made the search effort less successful.

 Acronyms Topics

TOPIC 24

What is Scenario Analysis?

Scenario Analysis is an attempt at analyzing what the missing person might have done after leaving the IPP.[1] The analysis starts with developing several plausible scenarios and ends with analyzing and prioritizing each of the them.

Scenario Analysis, like investigation, begins during the Initial Response and ends when the subject is found. It is not a one-time exercise—it is an ongoing activity that must be conducted throughout the incident. For example,

- In the Initial Response phase of a search.
- In the transition to an Area Search.
- Every time a new clue is located.
- After searching for some time without locating any clues.

There are three components to good scenario construction.

1. Get the facts.
2. Make reasonable assumptions.
3. Fit the facts and assumptions together.

These components are considered in turn.

1 Get the facts

a) The missing person's profile. Who is the subject of the search? What kind of person are they, their age, background, and health? This information is contained in the LPQ.

b) The incident history. What did the missing person set out to do and what were they doing when last seen? This is contained in the investigative report.

c) Map analysis. What kind of terrain is the subject in? Where are the hazards and what are they? What might act as a barrier or a likely spot (magnet)? Are there any well-defined routes that they might have followed? This involves local knowledge (so if possible involve someone who knows the area) and understanding and interpreting topographic maps.

d) LPB information. Having decided on the category of the missing person then LPB information provides the following:

- The type of behavior that people in this category have exhibited.
- The location in which they were found. Most categories of missing person tend to favor certain types of locations. By matching these with the map, likely places for the missing person can be identified.

[1] Scenario Analysis is based on the work of Dave Perkins and Pete Roberts, "The Use of Scenarios in Incident Management". The Centre for Search Research, Northumberland, UK.

 Acronyms Topics

- The "as the crow flies" (straight line) distance they were found from the IPP. This gives an idea of the possible size of the search area.

2 Make reasonable assumptions

a) To paraphrase Syrotuck: "*Put yourself in the subject's shoes*". "*If you were that age, that height, that frame of mind, and in that situation, what might you do?*"

b) Activity or purpose. What might the missing person have done to take them away from the IPP?

c) Direction of travel. Which direction would that activity take them from the IPP, bearing in mind any barriers, likely spots (magnets), and routes identified on the map?

d) Destination. This could be a place that they set out to travel to, or a location from LPB information that is consistent with their direction of travel.

3 Fit the facts and assumptions together

a) The scenario should be consistent with the known facts—these are contained in the missing person's profile, the incident history, and features on the map.

b) The scenario should be realistic. It should be consistent with the LPB information for this kind of person and this type of terrain rather than involving external agencies and chance events.

c) It is perfectly acceptable to have scenarios that take the missing person out of the immediate vicinity, for example they might have gone home or they might have had an accident and be in the hospital.

d) Routes and Locations: Visualize the scope of the problem by drawing the scenarios on a map.

i. Mark any travel aids such as trails, streams, ridges or gullies, that the scenarios suggest the missing person might have followed. Remember that there may be more than one route to get from the IPP to a possible destination.

ii. Mark any locations and hazards suggested by these scenarios. These can be specific, for example a particular building, a well-known viewpoint; or they may be general, for example the edge of a wood, a dry wash, a cliff face, or the shore of a lake.

The preferred Scenario Analysis method is to generate a number of scenarios rather than relying on one. At least three scenarios should be generated. With fewer scenarios, some perfectly reasonable possibilities may be missed.

Good scenarios include a direction of travel, a route, and a likely location. It may be that a number of scenarios cover a range of possibilities that appear to contradict each other, but this is perfectly possible—discount nothing, accept anything that is "reasonable", and avoid fantasy.

Having constructed reasonable scenarios, two things need to be done.

1. Record the details of each scenario.
2. Assign a priority to each scenario. Deciding where to search, what tactics to use, and where to assign resources is based on where the missing person is most likely to be. "Where the missing person is most likely to be" comes from these scenario priorities.

Scenarios constitute an important part of the incident and must be documented. See the following table for a suggested Scenario Record Sheet.

 Acronyms Topics

Scenario Record Sheet
Incident Name:

Scenario Details	Priority
A.	
B.	
C.	
D.	
E.	
F.	
Prepared by: Name: _____ Position: _____ Signature: _____ Date: _____ Time: _____	

Instructions for completing Scenario Record Sheet

1. Scenario Details. Write down any scenarios that may describe what happened to the missing person. Write them in any order. Include the assumed state of the subject: mobile, immobile, responsive, unresponsive.
2. Priority. Give each scenario some indication of the likelihood that it describes what actually happened. Base the priorities on what is known about the missing person, information obtained from the map, local knowledge, and information from LPB characteristics. Use numbers to indicate priority (1 for the highest, 2 for next highest, and so on, although the numbers need not be consecutive). Equally likely scenarios are given the same priority number.

Some final thoughts about Scenario Analysis

- Without scenarios the IMT is doing little more than guessing where the missing person might be.
- All four information sources needed to create scenarios must be used—missing person profile, incident history, map analysis, and LPB information. If one is omitted the picture is incomplete.
- Generating scenarios needs to be an established and ongoing part of the incident management procedure.

 Acronyms Topics

Part III
Area Searches

TOPIC 25

What is a Search Area?

One of the first actions in the transition from a Route and Location Search to an Area Search is establishing the search area. This is a critical action and, like other components of search planning, should not be done alone. The establishment of the search area sets the stage for the rest of the transition actions.

If a suitable Incident Command Post for an extended operation has not yet been selected it must be done at this point because much map and paper work needs to be completed during the transition. It is more comfortable and efficient to have a suitable space for this than it is to continue working off the hood of a truck.

At this stage it is assumed that during the Route and Location Search a PLS or LKP was determined and identified as the IPP. It is pointless to develop a search area if there is no IPP to base the search on.

When establishing the search area it is critical that quality maps of the region are available. Generally 1:24,000 scale topographic maps are used for this process, which are either in paper format or on a computer mapping or Geographic Information System (GIS) program. Other specialty maps, including orthophoto maps,[1] may also be helpful in interpreting the area especially if those maps have been in the possession of the search subject. Increasingly aerial photographs and internet based programs, such as GOOGLE Earth™ and Microsoft® Bing, are used to supplement topographic maps during this process. If paper maps are being used it is also helpful to have clear mylar or acetate for overlays and a variety of permanent and dry-erase markers available. The map selected for use in defining the search area needs to be reproduced for the IAP that is distributed to search resources once the search area has been identified and segmented. Key locations should be marked on the map such as the IPP, ICP, together with other incident facilities and important reference points.

When establishing the search area consideration of LPB, information collected from the LPQ, an analysis of the terrain and weather, and an examination of potential scenarios, that led to the subject going missing, are critical factors.

There are four common methods of establishing the search area, assuming the location of the IPP is known.

1. **Theoretical**. Based on the time elapsed, how far could the subject have traveled?
2. **Statistical**. What have others in the missing subject's category done?

[1] Paraphrasing `http://en.wikipedia.org/wiki/Orthophoto`, *An orthophoto is an aerial photograph geometrically corrected such that the scale is uniform: the photo has the same lack of distortion as a map. Unlike an uncorrected aerial photograph, an orthophoto can be used to measure true distances, because it is an accurate representation of the Earth's surface, having been adjusted for topographic relief, lens distortion, and camera tilt.*

 Acronyms Topics

3. **Subjective**. What are the natural or manmade features that could limit or direct the movement of the subject?
4. **Deductive Reasoning**. What does the IMT believe happened?

Each of these methods determines a region that is plotted on the map. The area common to all four regions determines the boundary of the search area. These methods should be applied in the order presented: Theoretical, Statistical, Subjective, Deductive.

Theoretical Method

The Theoretical Method attempts to estimate the maximum distance the search subject could have traveled from the IPP since they went missing. This involves some mathematics, and usually results in a fairly large circular search area, centered at the IPP.

In order to determine the Theoretical Search Area two numbers need to be estimated.[2]

- The time elapsed since subject was last known to be at the IPP.
- How fast the subject can travel away from the IPP—the speed of the subject radially.[3]

Once these numbers are known the Theoretical Search Area can be determined using the formula for calculating the area of a circle, πr^2, where $\pi = 3.14$ and r is the radius of the circle. The radius of the circle can be determined by multiplying the time elapsed by the speed that the subject can travel radially. The area of the circle, or Theoretical Search Area, can then be determined by squaring r and multiplying it by π.

For example, if the subject has been in the field for 8 hours and is able to walk at 2 miles per hour radially, then the radius of the Theoretical Search Area is

$$\text{Radius of Theoretical Search Area } = 2 \text{ miles per hour} \times 8 \text{ hours} = 16 \text{ miles},$$

and its area is

$$\text{Theoretical Search Area } = \pi \times \text{Radius}^2 = 804.25 \text{ square miles}.$$

A circle, centered at the IPP, with radius 16 miles, is then drawn on the map to identify the Theoretical Search Area. The Theoretical Search Area is often too large to search efficiently.

Statistical Method

The Statistical Method also determines circles centered at the IPP, but relies upon LPB analysis. It is important that the LPQ be completed as thoroughly as possible so that the appropriate LPB category can be selected for the search subject. The LPB data is then used to refine the search area based upon the historical behavior of other subjects in the same category. This data generally provides statistical zones and the median[4] and maximum distance that subjects in the selected category were found from the IPP.

The statistical zones, such as the 25%, 50%, and 75% zones correspond to the distance from the IPP that contained 25, 50, and 75 percent of the search subjects in that category. Each of these distances generates a circle on the map centered at the IPP. It is typical to use the 75% statistical

[2] Usually the distance is measured in miles and the speed in miles per hour, giving a radius in miles and an area in square miles.

[3] A subject travels away from the IPP at an estimated speed, and that speed times the time is the radius of the circle.

[4] The median distance from the IPP is the distance at which 50% of the cases are inside that distance and 50% of the cases are outside that distance. This is not the average (mean) distance from the IPP.

zone during the establishment of the search area because it excludes some of the extremes in the data and contains the majority of the subjects in that category.

Be wary of LPB data when the number of cases is small. It is also important to note that the subject of a search is not yet part of the data set and may do something entirely different than would have been predicted by the LPB data.

When the Statistical Method is used following the Theoretical Method the search area should be trimmed.

Subjective Method

The Subjective Method takes into account the physical environment and any clues that may have been found during the Route and Location Search. This method relies on an analysis of terrain or other physical barriers to travel, weather, clues, "hotspots", physical and mental health of the subject, gut feelings, and any other factors that may impact the subject's movement through the area.

Often an analysis of the terrain eliminates parts of the search area as they are inaccessible or impossible to negotiate without specialized equipment. The weather can also be a significant limiting factor to subject travel. In many parts of the country, very hot temperatures at one extreme and deep snow at the other routinely affect the ability of a subject to move through an area.

Deductive Reasoning Method

The Deductive Reasoning Method relies upon the IMT to evaluate all of the information available about the situation to develop a most likely scenario about what happened to the search subject. This should include any investigative material available about the subject. Coupled with the other methods this method continues to refine the search area and is generally the last method employed in the series. It is helpful if at least some of the personnel involved in using this method are familiar with the area and its history.

Final Steps in Establishing the Search Area

Once the four methods for establishing the search area have been employed the initial search area must be drawn on the map. Everything outside the search area is identified as the **Rest of the World** (ROW). The search area is likely to be too large for a single resource to search in one operational period. The search area then needs to be divided into smaller units, called segments, that can be searched in an operational period (about 6 to 8 hours of active searching) by a search team.

TOPIC 26

What is Segmenting a Search Area?

Segmentation is the process of slicing the search area into manageable regions called Segments. There are various reasons for doing this.

- To ensure that no part of the search area is ignored.
- To effectively manage the deployment of resources.
- To help set tactics that can be accomplished during an operational period.
- To track resources' tasks for the duration of the search.
- To have a means of quantifying the search effort in an understandable way (using *POD* and *CPOD*, discussed in Topic 33 on page 72).

Segmentation looks easy, but it is not. It takes practice, patience, and thought. Segmentation can be very difficult and is truly an art. When segmenting the search area it is critical to have

- Good map reading skills to interpret the topographic information.
- An understanding of the vegetation in the area.
- The ability to estimate the area of the segment.

Segment Boundaries

Segment boundaries are very important considerations so that the search teams on the ground can identify where their segments begin and end. Having a mixture of terrain and vegetation types in the same segment should be avoided. Good segmentation improves search efficiency and maintains or improves the morale of the searchers.

Segmentation should be practiced like any other search skill and feedback should be solicited from the searchers assigned to segments to determine if improvements are needed. If there are unknown caves, mines, sinkholes, lakes, or other features that require specialized resources to search, then these features are in the ROW (see Topic 31 on page 70) until they are discovered and made into their own segments.

Segmentation is a two-step process.

1. First, identify all regions that are not to be searched, that is, the ROW. Start with the area whose outer boundaries have been established. Within that area exclude regions such as places where the subject could not have reached (because they are out of range, because the subject could not get there due to the terrain or vegetation, etc.) and those regions that are not reachable by live subjects (such as under the surface of a lake), unless those regions are specifically identified as being of interest. The region that remains is the Search Area—it often looks like Swiss cheese, with holes in it.

2. Second, divide this remaining region, the search area, into clearly-identified, non-overlapping, segments that cover the entire search area. Whereas establishing the search area is based on factors that affect the subject, segmenting the search area is based on factors that affect the searchers.

In relatively flat, sparsely-vegetated terrain, it is common for the final search area to look like a distorted checker board, with no gaps in it, which is how most people imagine a segmented search area. In mountainous terrain, some segments might look like pieces of ribbon, being trails with strips of land on either side bordered by the ROW, leaving the search area pocked with disconnected regions that are in the ROW. So typically, a search area does not look like a distorted checker board—it has gaps in it.

The Incident Commander should be prepared to answer questions from the family and stake-holders concerning the fact that there are gaps in the search area. It may be necessary to explain to family and stake-holders that the subject could not reach some areas and thus those areas are not included in the search area.

Ideally segmentation should be performed by a segmentation team rather than an individual, preferably the same team that performs the consensus. Some members of the segmentation team must have a very good understanding of map reading in order to know which features make good segment boundaries and which features do not. Members with a personal knowledge of the area are invaluable.

When identifying segments, the segmentation team must consider the following points.

- **The Size of the Segment.** This is important because the size of the segment must be searchable by a typical resource in one operational period. This includes being briefed, transported to the segment, finishing their assignment, transported from the segment, and being debriefed. The size of the segment is dictated by the resource that is expected to be used, the terrain, and the vegetation. A rule of thumb is to make the size searchable by a typical search team in about 6 hours. If the segment is to be searched by ground resources (air-scent dogs, grid searchers, etc.) then a segment size of about 0.25 square miles is often quoted as being an appropriate size. The dimensions of various rectangles with area 0.25 square miles are shown in Table 26.1.

Table 26.1: Dimensions of rectangles with area 0.25 square miles

Length (miles)	0.5	1	2	3	4	5
Width (yards)	880	440	220	147	110	88

On a 1:24,000 topo map, a little more than 1.25 inches represents 0.5 mile while the width of a dollar bill represents about 1 mile. However, the area estimated on a map is almost always smaller than the area on the ground, unless the terrain is flat and horizontal.[1]

Making search segments too large is a common mistake.

  - Doing so causes searchers to rush to complete their assignments resulting in poor coverage and missed clues.
  - Searchers who do not rush, search only part of their segment, resulting in the segment having to be split, and the un-searched segment re-searched during a later operational period.
  - Not completing their assignments because the segment is too large causes poor morale.

- **Uniform Terrain and Vegetation.** The terrain and vegetation within the search segment should be relatively uniform. It is often helpful to consult an orthophoto map of the search area

[1] An overlay tool that helps estimate areas can be downloaded from `http://maptools.com/pdf/AreaEsts/BigArea.pdf`. When printing that file, ensure that the printer does not resize the image.

 Acronyms Topics

when segmenting to ensure that the vegetation and terrain are actually uniform. A resource cannot use consistent tactics, nor estimate a single *POD* (a measure of the efficiency of the resource, discussed in detail in Topic 33 on page 72) for a segment, if the terrain or vegetation vary considerably.

- **Segment Boundaries.**
  - Segment boundaries have to be identifiable by resources in the field. Ridge lines, rivers, cliffs, canyon bottoms, fences, power lines, railroad tracks, roads, dry washes, etc., make good boundaries because they are easily identifiable in the field. Good boundaries are essential to ensure that search teams assigned to different segments neither leave gaps nor overlap in their coverage.
  - Flagging may be used for segmenting long washes or canyons where the sides of the segment are clearly defined by the terrain but the bottom needs to be broken into shorter lengths. Once flagging is in place, it should remain there for the remainder of the search. Ribbon-like segments that follow very long trails could be segmented in this way.
  - Using GPS or UTM grid lines is strongly discouraged, but if they are used it must be with extreme caution to avoid gaps in coverage and overlaps with adjacent segments. Sometimes there is no choice but to use grid lines as segment boundaries by flagging them. For example, flat featureless terrains need to be flagged so that teams can identify their segments.
  - If the subject's dwelling is to be searched, then it would be natural to include this as its own segment.
  - When drawing boundaries, it is not good practice to have resources crossing streams, highways, chasms, and other natural barriers. This endangers the resources and distracts them from their assignments.
- **Individual Segments.** Regions such as trails, lakes, rivers, dry washes, should be treated as individual segments. This helps to ensure complete coverage for the whole trail within the search area or complete coverage for the lake, not just the shoreline. However, many trails may have been searched during the hasty search phase, or may be used as transportation corridors, so treating them as a separate segment may be unnecessary. They are automatically searched, but a note should be made that this was a conscious decision and not an oversight.
- **2-Dimensional Map.** The map that is being used to segment is 2-dimensional, whereas the search area is 3-dimensional. This means that segments drawn on maps represent the surface of the search area, not underneath the surface. For example, a lake or a snowfield may be a segment, but, unless specifically stated otherwise, the segment is the surface of the lake or snowfield, and includes nothing below the surface.
- **Shape.** A uniformly-shaped segment is desirable, but not always possible.
- **ROW.** Fast flowing rivers are always in the ROW, because the subject, if in it, would be mobile.
- **Identify Segments.** All segments must be identified with a unique number, and the ROW must be clearly marked.

Practical Matters

There are two possible maps that might be available for segmenting: paper and software.

Paper. When segmenting using a paper map it is best to draw the segments using pencil first in the event that minor changes need to be made during the process. After the segmentation is finalized, the pencil lines should be made permanent with an ink pen. Acetate overlays can then be used to document search activity. The segment boundaries can be traced onto the acetate overlay and then any other shading or documentation added to that overlay. It is helpful to tape the overlay to the map so that it does not slide around. Additional overlays can be added on top of previous ones to indicate the status of the search during subsequent operational periods.

Software. If GIS software is available, then the initial segments can be drawn by creating polygons on the map. As the search progresses, attributes can then be applied to that polygon to show how well the segment has been searched or the type of resource used to search. Different layers can be turned on or off in the software to show just the segments, just clues, or any other attribute that is of interest. This method is likely to be the way of the future and allows for better data management. Many agencies have a GIS department which may be able to assist in the field. This method requires computer hardware, GIS software, a large format printer (plotter), and an experienced GIS operator.

How to Segment

1. Draw the outer boundary of the search area on a map which is of the same type that is used by all resources. Label the region outside this area "ROW".
2. Identify all regions inside the area that are in the ROW, and label those with "ROW".
3. Identify regions that are of the same terrain and vegetation.
4. Segment those regions into sizes that can be searched by a typical resource in one operational period. These regions are called Segments. Use numbers[2] to label these segments, starting from "1". Label the segment containing the IPP as Segment 1 so that, whenever Segment 1 is mentioned, everyone knows they are talking about the IPP segment.
5. Identify all mine shafts, caves, dwellings, etc., and give them their own segment, and number them.
6. Identify any segments that are "under" the map that are to be searched. For example, below the surface of a lake, or under snow. Distinguish between these segments and their surfaces.
7. Make sure that every part of the search area is in one—and only one—segment.

[2] Using letters causes problems when there are more than 26 segments, and when a segment has to be split.

 Acronyms Topics

TOPIC 27

What is the Consensus Process?

When a Route and Location Search turns into an Area Search, an immediate task for the command staff is to identify the search area, and then divide it into non-overlapping segments. The region outside the search area is called ROW (Rest of the World). There is always a chance that the subject is in the ROW.

The next task is to identify the "hot" segments, which determines where to search first. We do this by putting together a small team of experienced search planners who are familiar with the search area. This team openly discusses the status of the search, the subject's habits, and the search area. Then each expert independently estimates the chance that the subject is in each segment by using a Consensus process to prioritize the search segments.

There are a variety of Consensus processes, the three most common being the Mattson method, the O'Connor method (sometimes called the modified Mattson method), and the Proportional method.

1. **The Mattson Method.** Here the individuals decide on the probability that the subject is in each of the search segments and the ROW, and assigns a numerical value to all these regions. Each has a value between 0% and 100%, and the sum of all values is 100%. Thus, a value of 30% for Segment 1 means that the individual thinks there is a 30% chance the subject is in Segment 1.
2. **The O'Connor Method.** This requires the individual to
   - Assign a numerical value between 0% and 100% to the ROW, which represents the individual's opinion of the chance that the subject is not in the search area. Thus, a value of 30% for ROW means that the individual thinks there is a 30% chance the subject out of the search area.
   - For each segment, the individual selects from the letters A through I according to the table:

Table 27.1: O'Connor Verbal Cues

Letter	Meaning
A	Very likely in this segment
B	
C	Likely in this segment
D	
E	Even chance
F	
G	Unlikely in this segment
H	
I	Very unlikely in this segment

 Acronyms Topics

These letters are then converted to numerical values according to a well-defined algorithm.

3. **The Proportional Method.** This requires the responder to
   - As in the Mattson and O'Connor methods, assign a numerical value between 0% and 100% to the ROW.
   - Select an initial likelihood for each segment. Each segment requires a number from 1 to 1000. The numbers 1 and 1000 do not have to be used. It is not a percentage. If one segment has the number 100 assigned to it and a second segment the number 25, this is interpreted as saying that the subject is 4 times as likely to be in the first segment than the second. These numbers are then converted to numerical values according to a specific algorithm.

No matter which of these three methods an individual uses, each segment and the ROW end up with a numerical probability. To find the consensus, we average all the individuals' numbers.[1]

Notice, it is pointless going through this process if the subject is moving from one segment to another.

A consensus is performed only once per search, unless the original search area was misidentified.

[1] If using Win CASIE III, see Topic 40 on page 85, the entire group of individuals performing the consensus does not need to use the same method.

TOPIC 28

What Assumptions are Made During the Consensus Process?

In reaching a consensus, the small team of experienced search planners assume that

1. The search area is well defined and segmented into reasonably-sized segments.
2. The search segments are very familiar to the search planners and contain no unknown features.
3. If the subject is in the search area, then the subject is not moving.
4. There is a chance that the subject is not in the search area.

There are at least four consequences of these assumptions.

- Unless specifically included in the original search area when the consensus is taken, regions such as beneath soil, beneath snow, or beneath water, are not in the search area, but are in the ROW. Thus, the search area is more 2-dimensional than 3-dimensional.
- If an item, such as a cave, mine-shaft, or dwelling, is discovered in a search segment that was unknown to the search planners at the time of the initial consensus, then that item is in the ROW. Had the search planners known of this item at that time, then that item would have been given its own segment and its own initial probability. To include this item in the search area at this stage, the search area must be expanded.
- A similar comment to the previous one applies to any regions searched that were initially in the ROW. For example, an investigator searches the subject's home without finding the subject. The search area must be expanded to account for this, by including the subject's home in the search area.
- The assumption that "If the subject is in the search area, then the subject is not moving" carries with it an important corollary, namely, "If the subject is moving then the subject is not in the search area, but in the ROW". Thus, rivers that flow fast enough to transport the subject are not in the search area but in the ROW. A similar comment applies to the abduction of a child being transported in a vehicle.

 Acronyms Topics

TOPIC 29

What are Probabilities?

We often speak of events and their chance, or probability, of occurring. Chance, or probability, is often used when the outcome of an event is not known exactly in advance.

Probability is a part of our lives. Everyday we make judgments based on probability.

- There is a 90% chance that the Wildcats will win their game tomorrow.
- There is very little chance of winning the lottery.
- There is a 20% probability of rain today.
- There is a 90% probability the subject is in the search area.
- If the subject is in my assigned search area, then I had a 60% chance of finding him.

Probability is a measure of how likely it is for an event to happen. Mathematically, probabilities apply to events and are numbers between 0 and 1. However, for everyday purposes, probabilities are often converted to percentages, so 0 = 0% and 1 = 100%. In spite of what people say ("I am 110% sure it will happen"), probabilities cannot exceed 100%.

If the probability of an event happening is 0%, then that event is guaranteed not to happen. For example, the probability that a person will be younger tomorrow than today is 0%, or the probability that the sun will not rise tomorrow is 0%.

If the probability of an event happening is 100%, then that event is guaranteed to happen. The probability that the sun will rise tomorrow is 100%.

Table 29.1 shows verbal cues for other probabilities.

Table 29.1: Probabilities by Verbal Cues

Probability	Meaning
100%	Guaranteed to happen. A certainty.
90%	Highly likely to happen
80%	
70%	Likely to happen
60%	
50%	Even chance of happening
40%	
30%	Unlikely to happen
20%	
10%	Highly unlikely to happen
0%	Guaranteed not to happen. An impossibility.

 Acronyms Topics

The chances of winning the Arizona Lottery is 1 in 195,249,054, which is a probability of about 0.0000005%. So that event is very, very, very, unlikely to happen, but not an impossibility, because the probability is not 0%. After all, people do win the lottery.

Notice that the statements in the first paragraph of this topic could also be written.

- There is a 10% chance that the Wildcats will not win their game tomorrow.
- There is very high chance of not winning the lottery.
- There is an 80% probability of no rain today.
- There is a 10% probability the subject is not in the search area.
- If the subject was in my assigned search area, then I had a 40% chance of not finding him.

So if P, as a percentage, is the probability of an event occurring, then $100 - P$ is the percentage probability of that event not occurring.

TOPIC 30

What is POA?

POA stands for Probability Of Area. In an area search, the search area is segmented. During the search, each segment has its own *POA*, the probability that the subject is in that segment. It is a number between 0% and 100%. Thus, a *POA* of 50% for Segment 1 means that we think there is a 50% chance that the subject is in Segment 1. The sum of the *POA*s and the probability that the subject is outside the search area (the *ROW*) must sum to 100%, because the subject must be either in or out of the search area.

*POA*s come in two varieties.

1. Initial *POA*s. These are the numbers that are assigned to each segment by the Consensus process.
2. Updated (or "Shifted") *POA*s. After a segment has been searched unsuccessfully (that is, the subject has not been found), the probability that the subject is in that segment decreases, while the probability that the subject is in one of the other segments or out of the search area increases. These new *POA*s are the Updated *POA*s.

For example, suppose, for the purposes of illustration, that we have two search segments and that the Consensus method assigned initial probabilities as follows. Note they sum to 100%.

Table 30.1: POAs

Segment	POA
ROW	20%
1	50%
2	30%

Thus, the initial *POA* for Segment 1 is 50%, and this is the hottest area. We also think there is a 20% chance the subject is out of the search area.

Let's assume we have only one resource. Based on the initial *POA*s, we decide to put this resource in Segment 1 at the start of Operational Period 1. At the end of the operational period, the resource returns and reports that they have not found the subject. Thus, the *POA* for Segment 1 will drop, and the other two will rise. If the resource does an outstanding job, these numbers change dramatically. If not, the change is less dramatic. Knowing how efficient the resource is allows us to update the *POA*s, which now might be

 Acronyms Topics

Table 30.2: Updated POAs

Segment	POA
ROW	30%
1	25%
2	45%

Note they still sum to 100%. So the chance of the subject being in Segment 1 has dropped from 50% to 25%, while the other two have risen. The new hot area is Segment 2. Thus, at the beginning of Operational Period 2 we would concentrate on Segment 2.

Of course, in a real search there would be many more segments and additional resources, which complicates the situation. That is where Win CASIE III comes in.

The *POA* is for the entire segment, so if a segment is split (see Topic 34 on page 73) then the *POA* has to be split.

 Acronyms Topics

TOPIC 31

What is ROW?

ROW, which stands for the Rest of the World, was introduced to the SAR community by the late John Bownds, a SARA member. See Topic 32 on page 71.

The term *ROW* is used in two different ways.

- To mean the physical region outside the search area. This is much more subtle than it sounds. Unless specifically included in the original search area when the consensus is taken, regions such as beneath soil, beneath snow, or beneath water, are not in the search area, but are in the ROW. Thus, the search area is more 2-dimensional than 3-dimensional. For example, if there is a lake within the search area, then, unless we plan to search beneath its surface, only the surface is in the search area, while beneath it is in the ROW. In the same way, if an item, such as a cave, mine-shaft, or dwelling, is discovered in a search segment that was unknown at the time of the initial consensus, then that item is in the ROW. Had the consensus team known of this item, then it would have been given its own segment and its own initial *POA*. To include this item in the search area at this stage, the search area must be expanded.
- To mean the likelihood that the subject is outside the search area. *ROW* is the *POA* of the region outside the search area. It is the probability that the subject is out of the search area, taking into account all searches which have occurred inside the search area.

Each time a segment is searched without success, the *ROW* increases. When this number gets very high, it may be time to expand the search area or suspend the search.

The *ROW* is used in a variety of ways.

1. If the *ROW* exceeds 50% then this means that there is more chance that the subject is out of the search area than in it. Consideration should be given to expanding the search area. If the search area is expanded, then the *POA*s for the new segments are taken from the *ROW*.
2. If the *ROW* is very high, say 95%, and the search area cannot be expanded, perhaps because of impassable barriers on the boundary, then consideration should be given to suspending the search.

 Acronyms Topics

TOPIC 32

Who was John Bownds?

John Marvin Bownds was born on April 22, 1941 and died on May 24, 1993. John's line of duty death was recognized by the Mountain Rescue Association at their annual conference on June 8, 2013 in Carefree, Arizona.

Recognition of John Bownds
Search & Rescue Line of Duty Death
Mountain Rescue Association
June 8, 2013

John Bownds joined the Southern Arizona Rescue Association (SARA) in March 1977. The state of Arizona experiences very high levels of search & rescue (SAR) activity and John was a dedicated responder to these missions.

On June 23, 1979, John Bownds responded to a Search & Rescue mission for a lost rock and mineral collector in the Sierrita Mountains, southwest of Tucson, Arizona. The search continued for several days and involved ongoing vehicular travel on dusty Sonoran Desert roads. The Valley Fever fungus thrives in Sonoran Desert soil and it is concluded that Johns inhalation of airborne spores led to a fatal Cocci-Meningitus infection. After a prolonged illness, John died in 1993 at 51 years of age.

In addition to John's dedication as a SAR ground pounder, he contributed immeasurably to the development of search theory and management. As a Professor of Mathematics at the University of Arizona, he combined his mastery of probability theory with practical search insight and not only co-authored the Computer Aided Search Information Exchange (CASIE) software program but also introduced the important concept of Rest of the World (ROW) to the search community. Furthermore, he led the research and publication of two search helicopter effectiveness studies in both low elevation desert and high mountain terrain. These studies were published in 1981 and 1991 respectively.

In recognition of his SAR achievements, John received the National Association for Search & Rescue (NASAR) State Award in 1983 and the NASAR National Award in 1991. As a SAR ground pounder, John made hands-on contributions to the saving of lives and the reduction of human suffering. As a developer of search theory and management, his work continues to benefit mankind and remains in active use throughout North America, Australasia, and the United Kingdom today.

John was survived by the love of his life, his wife Lynne, who died in 2011. They are buried alongside each other in Huntsville, Alabama. They are survived by their two daughters, Jennie and Layne, and their son, Gabe.

 Acronyms Topics

TOPIC 33

What are POD and CPOD?

POD stands for Probability of Detection. It is the probability that the resource finds the subject in its segment, assuming the subject is there. It is a measure of the efficiency of the resource. It is a number between 0% and 100%. Thus, a *POD* of 40% for a particular segment means that the resource searching this segment had a 40% chance of finding the subject, assuming the subject is in this segment.

It is the *POD*s that are used to update *POA*s. (See Topic 30 on page 68.)

POD has to be estimated. Usually novice resources (and some not so novice resources) overestimate their *POD*s. Overestimating a *POD* for a segment leads to artificially high *ROW*, which may cause the search to be suspended too early. It also skews the search away from that segment.

The *POD* applies to every square inch of a segment, so if a segment is split (see Topic 34 on page 73) then the *POD* is unchanged and is not split.

CPOD stands for Cumulative Probability of Detection. Each segment has its own *CPOD*. It is a measure of how well a segment has been searched by multiple resources. This number always increases but never exceeds 100%.

For example, consider the case when two resources search the same segment, one with a *POD* of 60% and the other with a *POD* of 50%. The *CPOD* is the combined effect of these two searches. However, to get the *CPOD*, we cannot add the individuals *POD*s (because that gives 110%, which is over 100%). Using the correct formula[1] we find the *CPOD* of 80%.

Having a high *CPOD* is worthless if the subject is moving.

[1] If P_1 and P_2 are the *POD*s for two searches of the same segment, then $CPOD = 100 - (100 - P_1)(100 - P_2)/100$.

 Acronyms Topics

TOPIC 34

What is Splitting a Segment?

If a resource does not complete the search of its segment, then that segment is split creating two (or more) new segments. Typically this would occur if a search team is assigned to search a specific segment, but, for various reasons, is unable to search the entire segment. For example, this could occur if a mounted unit encounters a fence line that is not feasible to cross multiple times, or if there is a rapid deterioration in the weather. The debriefers expect an accurate description of that part of the segment that has been searched, together with a *POD* for it. The Incident Commander then identifies the searched region on the map, and splits the segment into two (or more) pieces, some of which have now been searched, and others not. This requires that the segments be renumbered, and is best done using Win CASIE III. Before drawing any new segments on a map, it is wise to overlay the map with a new transparency.

A segment must also be split under the following circumstances. Two teams are assigned to the same segment, one to search a specific trail within that segment and the other to search the entire segment. In this case, the trail **must** be split from the original segment creating two new segments—the trail and the old segment without the trail. The resource searching the trail returns a *POD* for the new trail segment, whereas the resource assigned to the original segment returns a *POD* for both new segments. Not splitting the original segment into two and then trying to adjust the *POD* for the entire segment based on the efforts of the resource searching the trail, invalidates the process. **Assigning a *POD* to an entire segment based on searching part of that segment, is not a valid procedure.**

Extreme caution needs to be exercised when splitting a segment, which is illustrated by the following situation. Consider a very simple scenario where there are only two segments, Segment 1 and Segment 2. Imagine that a ground team and a helicopter are assigned to search Segment 1. The helicopter searches half of Segment 1 and has to depart. So the old Segment 1 is split into two new segments, namely new Segment 1 and new Segment 3. So

$$\text{Old Segment 1} = \text{New Segment 1} + \text{New Segment 3}.$$

If the new Segment 1 was searched by the helicopter than its *POD* is used in that segment, and no *POD* is used in the new Segment 3.

The problem occurs when the ground team returns. They were assigned to search Segment 1, but that was the old Segment 1. So what they have searched is the new Segment 1 and the new Segment 3, so *POD*'s have to be entered for both these segments.

A common mistake is to split a segment and then forget to enter the *POD*'s.

If a resource discovers a previously unknown region in a search segment then the segment is not split. In this case the search area is expanded.

TOPIC 35

What is Expanding the Search Area?

Expanding the search area means that part of the ROW is going to be included in the search area from now on. There are at least four circumstances that require expanding the search area.

1. If a previously unknown region is found in a search segment–but is not part of it, such as a cave, a mine shaft, or a dwelling–then the search area needs to be expanded. Were these regions known at the time the search area was identified and segmented and the consensus was taken, then those regions most likely would have been assigned their own segment number and specialized resource. In view of the fact that they were unknown at that time, they are in the ROW.
2. If the probability that the subject is out of the search area is high (that is the *ROW* is high), then consideration should be given to expanding the search area.
3. If a clue suggests that the subject is out of the search area, then consideration should be given to expanding the search area.
4. If a consensus has just been taken, and it is discovered that an important region was not included in the segmentation, then the search area can be expanded to include that region as a new segment, without having to redo the consensus.

 Acronyms Topics

TOPIC 36

What are the Helicopter Experiments?

In the 1980's a series of experiments were performed in Pima County, Arizona, attempting to measure the effectiveness of helicopters in both desert and mountainous environments.[1] In all cases the helicopters used were Bell Helicopters Type HH-1H (Iriquois), widely known as "Hueys", shown in Figure 36.1.

Figure 36.1: An air rescue crew of Detachment 1 37th Aerospace Rescue and recovery Squadron searching the desert area east of Ragged Top Peak, near Tucson, AZ. Note the scanner's superior visibility through the open cargo door.

Desert Searches

These experiments[2] were conducted north-west of Tucson in Sonoran desert terrain, as characterized by Figures 36.2 and 36.3. A typical helicopter crew consisted of a pilot (who devoted his full attention to flying and maintaining the "creeping line" search pattern[3]), a co-pilot, and 2 to 4

[1] These experiments were the joint effort of the Pima County Sheriff's Department, the United States Air Force Detachment 1 37th Aerospace Rescue and Recovery Section, the Southern Arizona Rescue Association, and the University of Arizona Mathematics Department.

[2] Bownds, J.M., Lovelock D., McHugh C.P., and Wright A.L. "Desert Searches: Effectiveness of Helicopters". Pima County Sheriff's Department, Tucson, Arizona, 1981. http://www.saraz.org/documents/Desert%20Searches%20Experiment%201981.pdf.

[3] A creeping line search pattern is where the helicopter flies a non-overlapping back-and-forth pattern moving deeper into the search area with each successive leg, until the entire search area is covered.

 Acronyms Topics

scanners located midway on each side of the aircraft to scan at right angles to the flight path through open cargo doors. The average speed was about 60 knots, the average altitude about 175 feet, and the average track spacing was about 0.25 miles.

One experiment was performed where the subjects were in the open, waving. All were found, giving an experimental *POD* of 100%. That experiment was not repeated.

Five other experiments were completed—3 on bright sunny days and 2 on overcast days—where all subject were immobile, under cover, and unresponsive. On bright, sunny days 7 of the 24 subjects were found, giving an experimental *POD* of about 30%. On overcast days, 11 of the 16 subjects were found, giving an experimental *POD* of about 69%. The reason for this dramatic change can be understood by examining Figures 36.2 and 36.3.

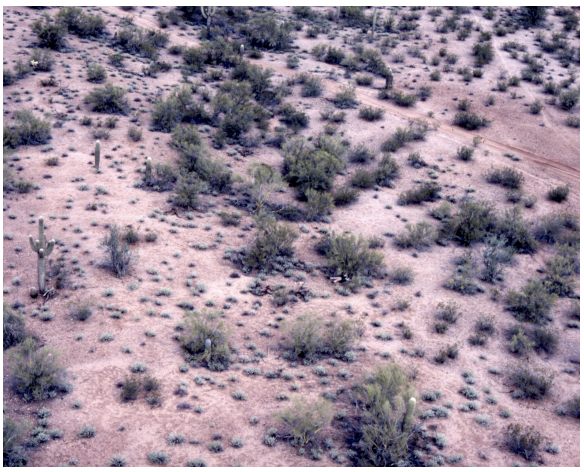


Figure 36.2: Cloudy Day—Where is the subject?

Figure 36.3: Sunny Day—Where is the subject?

Experimental POD's for subjects in the Sonoran desert.

- *For subjects in the open, waving.*
  - *The experimental POD was about 100%.*
- *For subjects immobile, under cover, and unresponsive.*
  - *On bright, sunny days the experimental POD was about 30%.*
  - *On overcast days the experimental POD was about 69%.*

Mountain Searches

These experiments[4] were conducted north-east of Tucson in the Santa Catalina Mountains where the elevations are between 6000 and 7904 feet. See Figure 36.4. A typical helicopter crew consisted of a pilot, a co-pilot, and 2 or 3 scanners.

Nine experiments were conducted. Five experiments were conducted where the subjects were in an upright and waving position. Three experiments were conducted where the subjects were

[4] Bownds, J.M., Harlan, A., Lovelock D., and McHugh C.P. "Mountain Searches: Effectiveness of Helicopters". NASAR, 1991. `http://www.saraz.org/documents/Mountain%20Searches%20Experiment%201991.pdf`.

Figure 36.4: Typical vegetation in search area in Santa Catalina Mountains.

lying in a prone spread-eagle position. The final experiment was conducted where the subjects were immobile, under cover, and unresponsive.

Experimental POD's for subjects in the Santa Catalina Mountains.

- *For subjects in the open who were*
  - *Upright and waving the experimental POD was about 60%.*
  - *Prone in a spread-eagle position the experimental POD was about 81%.*
- *Immobile, under cover, and unresponsive.*
  - *The experimental POD was about 0%.*

TOPIC 37

What is Grid Searching?

In contrast to the Routes and Location Search, the Area Search focuses on searching segments. (See Topic 26 on page 59.)

Once an Area Search is undertaken it is assumed that the subject of the search is no longer mobile. The subject may be responsive or unresponsive. As a result the search of a segment is more systematic. Resources use Area Search Tactics rather than Hasty Tactics to conduct the systematic search. Examples of Area Search Tactics include

- Ground Sweep Search.
  - Visual Sweep
  - Sound Sweep.
- Aerial Sweep Search.
- Hyperspectral Camera Analysis.
- High Resolution Camera Analysis.

During an Area Search, some Hasty Tactics might still be used especially if a clue such as a track is found by the team conducting the segment search. If a track is found a Tracking Team may be brought in to follow the track while the team assigned to the segment continues their assignment.

Search teams that are assigned to search a segment should have a designated team leader who receives a briefing from the Incident Management Team about the assignment. The leader should then brief the rest of the team and assign any subordinate tasks such as communication and primary navigation. The leader is charged with the overall responsibility for the team, including making sure that the team conducts the segment search in the way requested by the IMT and ensuring that the region searched is documented on the map or GPS and reporting any clues found to the Incident Command Post. If the search of the segment is not completed it is imperative that the team leader be able to show what was searched and identify the reasons that the entire segment could not be searched during the operational period. Following the completion of the assignment the team leader must report to the Plans Section so that a debriefing can be conducted. It is helpful if the team leader completes an ICS 214 Unit Log documenting important occurrences during the assignment.

Ground Sweep Search

The Ground Sweep Search is a line search where searchers on a team are spaced an equal distance apart along a line and the team makes parallel sweeps through a segment to cover the entire segment. This type of search is also called a Grid Search. A typical grid search team should consist of a team leader and no more than seven team members. On occasion, several grid search teams may be assigned to work together to search a segment. In that situation the team leaders should

coordinate their actions to complete the assignment. The closer together the searchers are spaced the higher the theoretical *POD*. However, tight spacing of the searchers may not be the most efficient use of the SAR resources available.

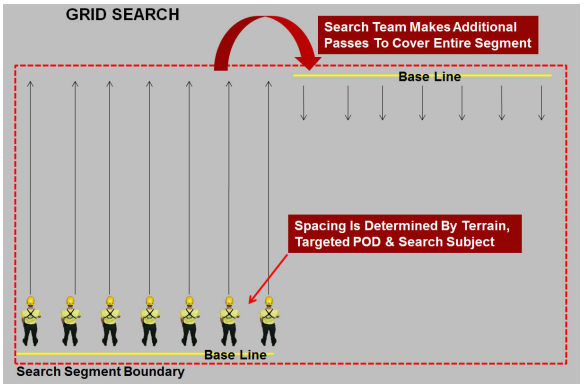


Figure 37.1: Grid Search—In Theory

Figure 37.2: Grid Search—In Practice

While conducting the sweep the team may employ only a visual sweep or a sound sweep. The Visual Sweep involves searching the segment while relying primarily on visual observation of the segment. This technique is used if the subject is immobile and unresponsive. The Sound Sweep technique involves searching the segment using both audio and visual observations. One method for conducting a Sound Sweep search is to have the team searching the segment stop every couple of minutes to yell or blow whistles simultaneously and then **wait** from 30 seconds up to a minute listening for a response.[1] If no response is heard the team continues to move through the segment. This technique is effective if the subject of the search is responsive. The search team should be constantly looking for clues, including audio-, visual-, and scent-related, during the sweep. If a clue is located the entire team should stop while the clue is investigated, documented, and reported to the Incident Command Post. Once the disposition of the clue is determined the team then continues the sweep. A team may make several sweeps to cover the search segment entirely.

The goal of a Ground Sweep Search is to achieve the highest *POD* possible given the conditions. The goal is not to cover the segment as fast as possible.

The Ground Sweep Search is best conducted by experienced and trained SAR personnel. However, if non-trained SAR personnel such as other law enforcement or military personnel are available and properly equipped, then they can be given some basic training on the technique and then used in a Ground Sweep Search under the supervision of a SAR team leader.

It is helpful if the personnel on the ends of the Ground Sweep Team flag their path as they make sweeps so that the team can remain oriented when they make another sweep. A GPS is also helpful if the track log is turned on so that the personnel on the ends can ensure that the team is making a subsequent sweep immediately adjacent to the completed sweep.

Aerial Sweep Search

Aircraft may be used to conduct segment searches in addition to or in lieu of ground searchers. The tactics used by air resources are different for a segment search as compared to a Hasty Search. The aircraft conducts a systematic pattern of passes over the search segment in order to search the complete segment. It is important that the aircraft crew members be able to determine the segment boundaries. Aerial Sweep Searches are most successful in locating responsive subjects that are able to signal the aircraft in some fashion.

[1] Be aware that not everyone's hearing is perfect.

Hyperspectral Camera Analysis—ARCHER

The Civil Air Patrol operates several aircraft equipped with the ARCHER system, which is a hyperspectral camera. The aircraft crew is briefed about the segment or segments that they are assigned to search and then those areas are programmed into a computer. The crew then ensures that the camera covers the entire segment with no gaps by monitoring the computer system on board. While flying over the segment the camera looks for specific color spectra or anomalies in the search area and develops a geotagged "chip". The ARCHER operator can review the chips while in flight or more commonly reviews the entire set of chips on a computer once on the ground. The chips are examined to determine if they are related to the search subject and if so another resource is sent to the location indicated by the geotag to investigate the object.

High Resolution Camera Analysis

There has been some success in flying over a search segment and photographing it with high resolution cameras. Once on the ground the photos are studied and may be examined by reversing the image (making it appear as a negative) to look for anomalies or objects that stand out. If an object of interest is identified a resource is sent to the area to investigate the object.

 Acronyms Topics

TOPIC 38

What is Critical Separation and Purposeful Wandering?

One of the important questions that arises during a Ground Sweep Search (see Topic 37 on page 78), is how far apart to space the searchers. There are different ways to determine the spacing but Critical Separation is the most practical method for use during search operations.

The Critical Separation (CS) method was developed by Dave Perkins and Pete Roberts.[1] This is a relatively fast way to determine searcher spacing that generates a *POD* of about 50%, and should be conducted in a representative piece of terrain that is similar in topography and vegetation to the segment to be searched.

To determine the spacing an object similar to the object being searched for is placed on the ground in the representative piece of terrain and the members of the search team move away from the object in different directions keeping it just barely in sight. The distance from the object to each searcher is then measured and all the distances are averaged. This average distance represents 0.5 CS since the searcher would be scanning an area equal to the distance to the object both to the left and right of the searcher. One CS is equivalent to twice the distance from the searcher to the object.

Figure 38.1: Critical Separation

[1] Perkins, Dave. "Probability of Detection (POD) Research, And Other Concepts For Search Management". Emergency Response Institute, Olympia, Washington. 1989.

 Acronyms Topics

Searchers assigned to a segment space themselves at 1 CS apart and then make sweeps through the segment attempting to keep the original spacing. To boost the chances of finding the search subject Perkins and Roberts introduced the idea of Purposeful Wandering to the Ground Sweep Search that uses Critical Separation. Purposeful Wandering allows the searchers on a segment search that are spaced according to Critical Separation to deviate from their straight line track to look at objects that attract their attention or may conceal the subject such as bushes, rocks, and trees, before returning to the place where they left their centerline. In general the Critical Separation should be maintained as the sweep progresses through the segment.

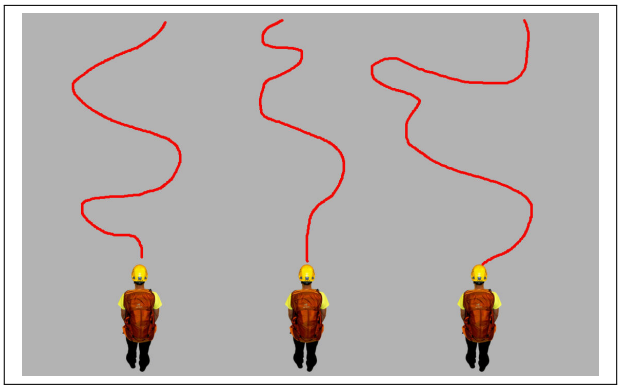


Figure 38.2: This is not purposeful wandering

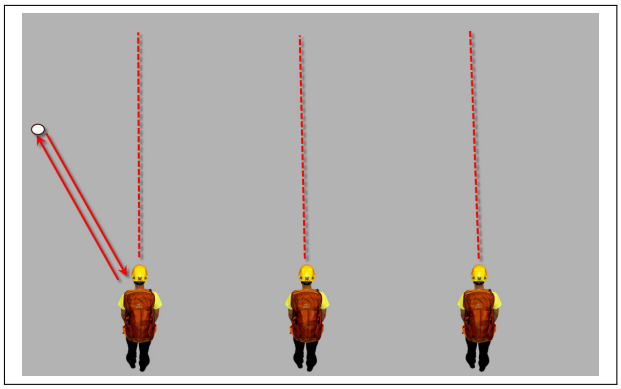


Figure 38.3: This is purposeful wandering

Often when a Segment Search is conducted, searcher spacing of 1 CS is requested but other distances are possible.

TOPIC 39

What are T-Cards?

IMTs and ICs have several options for tracking resources at an incident. One of these, the traditional way, is to use T-Cards. The purpose of T-Cards is to give a visual state of the search.

When the traditional system is used, resources are checked in using an ICS 211, Check-In List. See Figure 39.1.

INCIDENT CHECK-IN LIST (ICS 211)

1. Incident Name:	2. Incident Number:	3. Check-In Location (complete all that apply): ☐ Base ☐ Staging Area ☐ ICP ☐ Helibase ☐ Other	4. Start Date/Time: Date: Time:

Check-In Information (use reverse of form for remarks or comments)

5. List single resource personnel (overhead) by agency and name, OR list resources by the following format:							6. Order Request #	7. Date/Time Check-In	8. Leader's Name	9. Total Number of Personnel	10. Incident Contact Information	11. Home Unit or Agency	12. Departure Point, Date and Time	13. Method of Travel	14. Incident Assignment	15. Other Qualifications	16. Data Provided to Resources Unit
State	Agency	Category	Kind	Type	Resource Name or Identifier	ST or TF											

ICS 211 **17. Prepared by:** Name: _____ Position/Title: _____ Signature: _____ Date/Time: _____

Figure 39.1: ICS 211, Check-In List, used in the traditional system

After check-in, the information regarding each resource is transcribed onto a T-Card. See Figure 39.2. These cards are color-coded and have a larger top (thus, the T-like shape). They are

put in a T-Card rack or apron, which has many slots, with just the top of the card showing. See Figure 39.3. The color determines the kind of resource. The cards are arranged on the rack/apron in a manner that shows where they are located and their status. As resources change assignments or status, the cards can be moved to reflect the new condition.

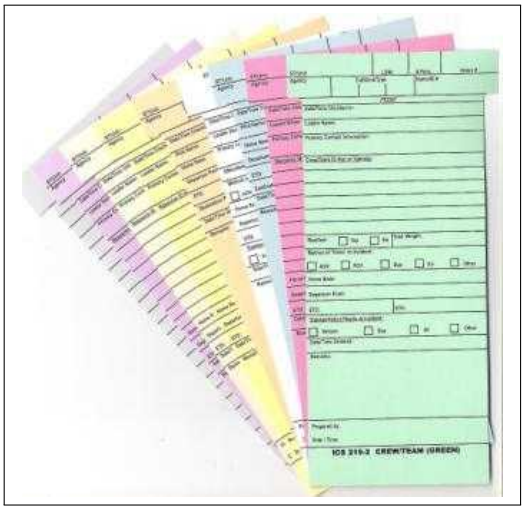


Figure 39.2: Examples of T-Cards

Figure 39.3: Example of T-Card display apron

The status of a resource that is checked-in but not checked out, falls into one of three categories.

- Assigned. Currently working on an assignment under the direction of a supervisor.
- Available. Ready for immediate assignment and has been issued all required equipment.
- Out-of-Service. Neither available nor ready to be assigned (for example, maintenance issues, rest periods).

The rack's columns are frequently thought of as "Checked In", "Assigned", "Available", "Out Of Service", and "Checked Out".

There are disadvantages when using T-Cards in a SAR incident.

- A T-Card rack is not always available.
- It takes time to fill in a T-Card.
- In the typical ICS setting, there are seven kinds of T-Cards: Aircraft, Crew, Dozer, Engine, Helicopter, Miscellaneous, and Personnel, which are not SAR oriented.
- In order to record the status of the search at the current time, the rack must be photographed.

TOPIC 40

What is CASIE?

In the 1970's the late John Bownds, a SARA member and a University of Arizona mathematician (see Topic 32 on page 71, created a program for the recently-released Texas Instruments programmable calculator. This program performed rudimentary *POA*, *POD*, and *CPOD* calculations, which until then had been done by hand. Bownds called the program CASIE (kay-sea), which stands for Computer Aided Search Information Exchange.

That is how we helped run area searches until 1982, when David Lovelock, a colleague of Bownd's, wrote a BASIC program for the Commodore 64, which was more flexible than the TI. There were many searches where we lugged the C64, a tape drive, a printer, and a TV monitor to the command post. However, this was not a very user-friendly program. In fact Lovelock was the only person who used it.

Then in the mid 1980's, by which time it was clear that IBM DOS machines were beginning to dominate the market, Lovelock wrote a free, user-friendly, C program for that operating system. Over the years more bells and whistles were added and its final DOS version was called CASIE III. By this time, Mike Ebersole, a ranger working at the Grand Canyon National Park, and Dan O'Connor, of the O'Connor Consensus method, had joined the development team. CASIE was used successfully in many large-scale searches in US, UK, Canada, Australia, New Zealand, South Africa, and Israel. It was distributed by NASAR, but could be freely copied.

In 2006 the Windows version of this software was written and named Win CASIE III, abbreviated WC3. Rick Toman, the SAR Coordinator for the Commonwealth of Massachusetts, joined the development team. WC3 was released publicly and made available via the Web. Although the availability of WC3 was not advertised, there were over 1000 unique visitors to the website in the first 30 days. Since its release, many people have suggested additions to it, so WC3 has developed a life of its own.

WC3 is a search planner's toolkit that runs under Windows XP and above. WC3 is free and can be downloaded from `www.wcasie.com`.

CASIE was written to help in Area Searches. However, WC3 can be used in both Route and Location Searches and Area Searches. There is a smooth transition from one to the other.

How can WC3 help during Route and Location Searches? It can

1. Provide summaries of lost person behavior.
2. Provide a check list of essential tasks.
3. Print search management forms, such as the Lost Person Questionnaire.
4. Print blank Mattson, O'Connor, and Proportional forms.
5. Keep a complete record of planning decisions using the Initial Note.

How can WC3 help during Area Searches? It can

1. Print debriefing forms.
2. Calculate the consensus for the Mattson, O'Connor, and Proportional methods.
3. Do all the POA, ROW, POD, and $CPOD$ calculations.
4. Split segments.
5. Add segments.
6. Account for clues.
7. Perform "What If?" analysis.
8. Suggest advice on allocating of resources.
9. Keep a complete record (an audit trail) of all planning decisions and actions.
10. And much, much, more.

Over the years, both SARA members and others have contributed to its debugging and development.

TOPIC 41

What is the Anatomy of an Area Search?

- **The Search Area.** The search area is defined and divided into search segments.
- **The Consensus.** A group of experienced people create an initial *POA* consensus. (See Topic 27 on page 63.)
- **Resources Deployed.** Resources are assigned to search segments, based on the current *POA*s, initially generated by the Consensus. (See Topic 30 on page 68.)
- **Subject Found.** If the subject is found, the search ends.
- **Subject Not Found.** If the subject is not found and if the resource completed its search of the assigned segment, that resource's POD is estimated, and the *POA*s are updated using Win CASIE III. (See Topic 40 on page 85.)
- **Split Segment.** If a resource did not complete the search of its segment, the segment is split creating two new segments from one old segment.
- **Expand Search Area.** If a previously unknown region is found in a search segment (but is not part of it), then the search area needs to be expanded.
- **Expand Search Area.** If the probability that the subject is out of the search area (in ROW) is high, then consideration should be given to either expanding the search area or suspending the search.
- **Found Clues.** If a clue is found then its influence on each segment and the *ROW* is estimated. This may mean that the search area must be expanded.
- **Suspend Search.** A decision is made whether to suspend the search. (See Topic 42 on page 88.)
- **Continue Search.** If the search continues then return to item 3.

TOPIC 42

What is a Limited Continuous Search?

A search cannot continue indefinitely. Sometimes, even the most well-run searches fail to locate the missing person. One of the most difficult decisions that the IC and the IMT have to make is the decision to transition to a Limited Continuous Search. This is a state in which the incident is not closed, but there is no active searching. However, if clues are discovered they are investigated and, if warranted, active searching is resumed. While the decision to transition is not "cut and dried", there are several situations that can help the IMT determine when suspension should be considered. These include:

- The conditions make searching unsafe for SAR personnel.
- The available resources are exhausted, and additional, experienced resources are not readily available.
- The probability of significant search personnel mishap or injury exceeds the probability of subject survival. See Figure 42.1.

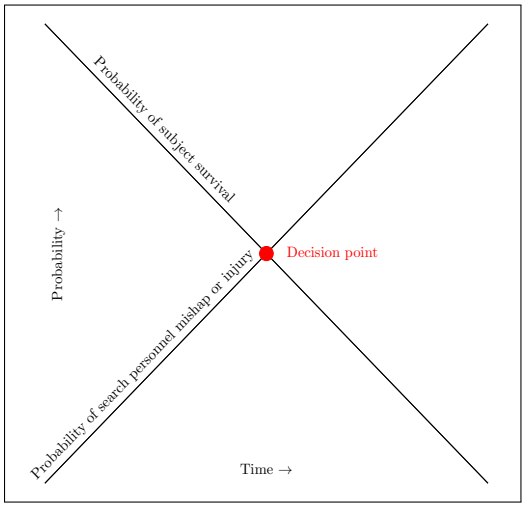


Figure 42.1: Probability of search personnel mishap or injury vs probability of subject survival, as a function of time

- The missing person's chances of survival are significantly diminished.
- Higher priority missions develop that are drawing resources from this incident.
- The investigation strongly indicates that the subject in not in the search area.

- The *ROW* indicates that a transition is warranted.

Putting a time limit on a search—such as 3 days, and then reaching it—is not, by itself an acceptable reason to transition to a Limited Continuous Search. Numerous other factors must be evaluated and considered together before making the decision to transition.

Because the decision to transition is so difficult, a consensus process, involving the Incident Management Team (IMT), see Topic 50 on page 106, and the Agency Administrator (AA), see Topic 48 on page 102, is often used to make the final decision.

Usually the IC makes the decision to evaluate whether to transition the search incident when one or more of these situations exist. At that point, all of the pertinent information about the incident must be gathered for consideration by the IMT and AA.

This information includes, but certainly is not limited to:

- Subject survivability tables and data tailored to the missing person's profile and situation.
- Current *POA*s and *CPOD*s for each search segment and the *ROW*.
- Extent of physical coverage of each segment and any areas that have not been actively searched ("holes in the search area").
- Hazard locations and severity of each.
- Unresolved clues.
- Investigative information related to possible criminal activity.
- Current resource status and condition.
- Potentially available resources—number, kind, type, and location.
- Equipment problems.
- Short and longer range weather forecasts.
- Political or family pressures to continue the search.
- Financial information (cost of search to date, funding availability for continuing efforts).
- Other information considered critical to making the decision to transition the search.

At that point, a matrix such as that shown in Table 42.1, can be used to evaluate the IMT's conclusions on essential elements of the decision.

Table 42.1: Transition to Limited Continuous Search Matrix

Factor	Comments	For	Against
Survivability			
Search Area Coverage			
Likelihood in the ROW			
Hazards			
Unresolved Clues			
Investigative Information			
Resources condition			
Additional resources availability			
Equipment condition/function			
Predicted weather			
Financial considerations			
Political considerations			
Other considerations (list)			

The decision to transition a search incident then depends upon the IMT's and AA's assessment of how each factor individually affects whether or not to transition, as well as whether the combination of factors supports transitioning the search incident.

 Acronyms Topics

TOPIC 43

What is an AAR?

An After Action Review (AAR), sometimes called a Hotwash, should be conducted following every SAR incident. An AAR is a tool designed to evaluate an incident in order to improve performance by supporting strengths and correcting weaknesses of the plan, the responders, and the response. On small scale incidents the AAR may be informal and conducted around the hood of a vehicle or at the ICP. For larger and more complex incidents, the AAR may be held more appropriately in a formal setting a short time after the incident is concluded.

The goal of each type of review is the same. Important aspects of the AAR include determining:

- How did this incident occur?
- How could it have been prevented?
- What worked well, and should be incorporated into the next incident response?
- What did not work well, and could be improved before the next incident?
- What else should be done on the next incident?

The AAR is not the place to point fingers or place blame, rather it should be a learning exercise so that improvements can be made, and successful actions can be repeated. Lessons learned from past searches are the basis for improving search management. Much of successful search management comes from learning from each other. Sharing the lessons learned and the near misses helps everyone do a better job.

On smaller incidents, the content of the AAR may not be documented, but on large or complex incidents, the Planning Section may be actively involved in preparing for, and documenting the results of the AAR.

The IC is responsible for conducting the AAR, unless the Agency Administrator (AA) determines that someone else, outside the IMT conducts it. During the AAR, participants should identify any changes that need to be made to the preplan, training, equipment or future response protocols, and the actions required to effect these changes. The IC and/or the participants then determine who is responsible for completing each action, and when it is to be done.

If the IC is from the agency having jurisdiction, the IC may be responsible for ensuring that the recommended changes are made following the AAR. The Planning Section Chief (PSC) may facilitate the accountability process by developing a written AAR follow up action plan, or matrix. This action plan or matrix should include all of the follow-up action assignments made during the AAR, the person responsible for each assignment, and the due dates for completion. The IC and/or the AA can then use this plan to ensure that all actions are completed as assigned.

 Acronyms Topics

TOPIC 44

What is Demobilization?

Demobilization is the process of checking out and moving all incident resources safely home from an incident. Although sometimes overlooked, or poorly planned and executed, demobilizing the incident personnel and equipment is an important part of an incident. The IC is responsible for all incident resources from the time they leave their home bases enroute to the incident until they arrive home from the incident. Getting everyone home safely, cost effectively and timely is a key component of good incident management. In some ways, demobilization may be as important as the search operations because of the morale and physical condition of the incident personnel at the time of demobilization. When people are tired they are more accident prone. Numerous searchers have been severely injured or killed in traffic accidents driving home from a search. It is important to have a work/rest policy for the incident to ensure that search personnel are adequately rested prior to being demobilized. Remember, an effective demobilization leaves a lasting, positive impression on incident responders.

Death of an Incident Commander, Virginia

Five-year-old boy Victor Shoemaker was reported missing and lost after wandering away from kids he was playing with in the mountains of Hampshire County near the town of Kirby, WV. At 8 o'clock on the morning of May 3, 1994, 24-year-old Lisa Hannon had just been relieved as Incident Commander by fellow Appalachian Search and Rescue Conference (VA) members. Lisa had worked tirelessly through the night to organize the massive search operation that would eventually involve over 1,000 personnel. She had not slept in 23 hours. Twenty minutes after sliding in behind the wheel of her truck, Lisa fell asleep while driving and struck a tree on U.S. Route 50 at full speed, killing her instantly. Lisa's death was the first line-of-duty death for the State of Virginia Search & Rescue Program.

Demobilization usually occurs at the end of an incident. However, in search incidents using volunteer resources, demobilization may be required on a daily basis. Volunteer resources may travel some distance to participate in the search for only an operational period, and then need to be demobilized and returned home to be available for their regular jobs. Demobilization on a search is often an ongoing and complicated process.

TOPIC 45

What are Signs of Trouble?

A search and rescue operation is a dynamic event and it is relatively easy to get overwhelmed and behind the curve in managing the incident. To help avoid that there are some signs of trouble that should be recognized and corrected.

1. **Lack of Investigation**
   It is easy to want to dive into search operations without conducting much investigation but that is not a good idea. Take the time to initiate and maintain an investigation to determine the who, what, where, why, and how of the incident. It is very important to identify the PLS or LKP and protect it, determine the category of lost person, identify any trip plans and the equipment that the subject had, and determine what type of clues could be available.
2. **Lack of Containment**
   Containing the search area as early as possible will help to keep the area that must be searched as small as possible and may lead to the discovery of the subject or important clues. Again it is easy to overlook this task in favor of getting personnel out searching but that is generally a bad idea. You may not need your most experienced SAR members to do this task. With an adequate briefing it may be possible to use patrol volunteers, land management agency recreation staff, CERT team personnel, or others in this capacity.
3. **Task Overload**
   When you feel like there are too many things to do and not enough time to do them it is time to expand the incident management team in order to delegate tasks. If qualified personnel are not available locally do not be afraid to reach out beyond your local jurisdiction. There are many personnel in the state who are ready and willing to help.
   Plan ahead and consider your resource needs well ahead of time so that you have time to request and receive the resources you need to conduct the operations.
4. **Lack of Technical Expertise**
   Increasingly information and intelligence is becoming more complex and may require technical expertise to analyze and employ. It is important to realize when you need assistance from a technical specialist to help in the incident management. For example:
   - All SAR operations inherently rely on an understanding of the mission area. While paper maps are still useful and reliable there are powerful mapping software programs (Geographic Information Systems) that can provide additional terrain analysis that can be invaluable in search planning and management. These systems have technical aspects and there are personnel who are highly trained and qualified in their use and could be employed on an incident to efficiently and effectively run that aspect of the incident management.

 Acronyms Topics

- Cellular phones and other electronic clues are also increasingly important clues in a search. A level of training and understanding is needed to be able to interpret and analyze that information so that it can be used appropriately in conducting a search. If you do not understand what you are looking at or how to apply it do not simply ignore it, get help. There is technical expertise available to help you understand these clues.

5. **Lack of Family Liaison**
   Families of SAR subjects are generally going to be upset, scared, and have questions. Assigning a Family Liaison can offer great assistance to the family and relieve some of the burden on the incident commander so that the IC can focus on other aspects of conducting the mission. The Family Liaison can explain the actions of the incident management team and the types of search activities taking place. They can also answer questions and address concerns. If a family feels alienated they may turn to non-affiliated search and rescue units, attempt to organize an independent search through the use of social media, or seek other outside support. That, in turn, increases the complexity of the mission and may conflict with the objectives of the official search effort.
6. **Communications Deficiencies**
   Plan for and test communications prior to an incident and during an incident. It is important to develop an appropriate communications plan for the safety of personnel and to be able to exchange important searching and planning information. There are many non-SAR resources that may be able to help with this including amateur radio operators.
7. **Lack of Documentation**
   No one enjoys paperwork but the lack of documentation can come back to bite you. Make sure that documentation about objectives, decisions, assignments, clues, and important locations are documented adequately. This will help the planning efforts for future operational periods, aid in the after action review, and be critical in the event of any legal action that results from the operation. There are many tools to help with documentation including Win CASIE III and ICS forms.
8. **Lack of Risk Management Process**
   Search and Rescue operations have inherent risks associated with them. It is important to take a step back prior to engaging and conduct some sort of risk analysis and then take steps to mitigate the identified risks. We must remember that our own safety is our first priority, the safety of our teammates is our second priority, and the subject is our third priority. We cannot effectively help the subject of the search mission if we as individuals or our team gets into trouble. Watch out for the high risk/low frequency events.
9. **Ego**
   Do not be afraid to ask for help. Asking for help is not a sign of weakness but rather a sign of maturity and commitment to doing the best job you can for the team and the subject of the search. None of us is an expert at everything and we should always strive to learn more about topics important to our profession. Take time to mentor new personnel and seek advice of experienced personnel.

Part IV
ICS—Incident Command System

 Acronyms Topics

TOPIC 46

What is an ICS 201?

The first few hours of any incident are often stressful and confusing. The initial information about the subject and the incident is often vague, incomplete, and sometimes contradictory. Many things happen at once, and there are numerous competing demands for the IRIC's time and attention. Decisions made and actions taken in these initial hours determine the outcome and length of the incident.

If the missing person is not found in the first few hours, it is imperative that the IRIC plans for the expansion of the incident complexity, and orders additional trained resources and management assistance. Recording the early decisions and actions helps keep important information from getting lost, and facilitates information sharing when the IRIC transitions the incident to another Incident Commander (IC) or to an Incident Management Team (IMT).

The ICS 201 is one way of documenting the Initial Response.

The ICS 201, Incident Briefing form, see Figures 46.1 to 46.4, provides an organized, convenient tool for the IRIC to record this important information for the incident record. It is also used to brief the incoming IC and IMT.

The ICS 201 consists of four pages.

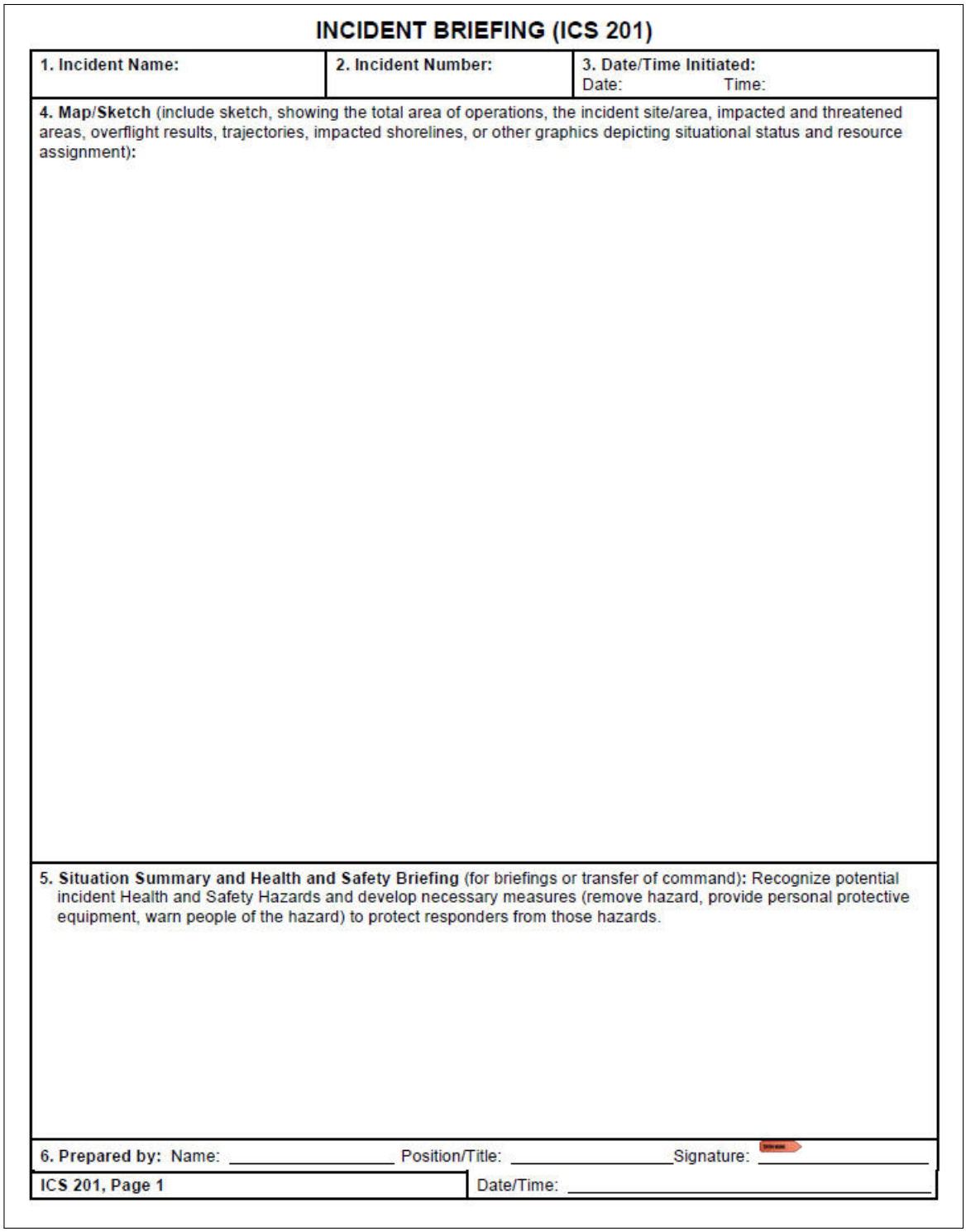
Page 1—Figure 46.1 on page 96. The first page contains an incident map or a sketch of the major features of the incident. It also contains the initial situation summary and the important aspects of health and safety that need to be considered and communicated to oncoming incident personnel.

Page 2—Figure 46.2 on page 97. The second page contains the initial incident objectives, both current and planned, and the current and planned actions, strategies, and tactics for resolving the incident during the initial response period, along with the important events and decisions that occur during the Initial Response period.

Page 3—Figure 46.3 on page 98. The third page contains a current Organization Chart showing all of the positions filled at the time the ICS 201 is completed.

Page 4—Figure 46.4 on page 99. The fourth page contains a list of all of the resources ordered, en route, on scene, and their incident assignments. This is the log-in sheet for an Initial Response. It also serves as a record of the tactical assignments for each resource during the Initial Response phase of the search.

 Acronyms Topics



INCIDENT BRIEFING (ICS 201)

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated: Date: Time:

4. Map/Sketch (include sketch, showing the total area of operations, the incident site/area, impacted and threatened areas, overflight results, trajectories, impacted shorelines, or other graphics depicting situational status and resource assignment):

5. Situation Summary and Health and Safety Briefing (for briefings or transfer of command): Recognize potential incident Health and Safety Hazards and develop necessary measures (remove hazard, provide personal protective equipment, warn people of the hazard) to protect responders from those hazards.

6. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 201, Page 1 Date/Time: _____

Figure 46.1: ICS 201—Page 1

INCIDENT BRIEFING (ICS 201)

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated: Date: Time:

7. Current and Planned Objectives:

8. Current and Planned Actions, Strategies, and Tactics:

Time:	Actions:

6. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 201, Page 2 Date/Time: _____

Figure 46.2: ICS 201—Page 2

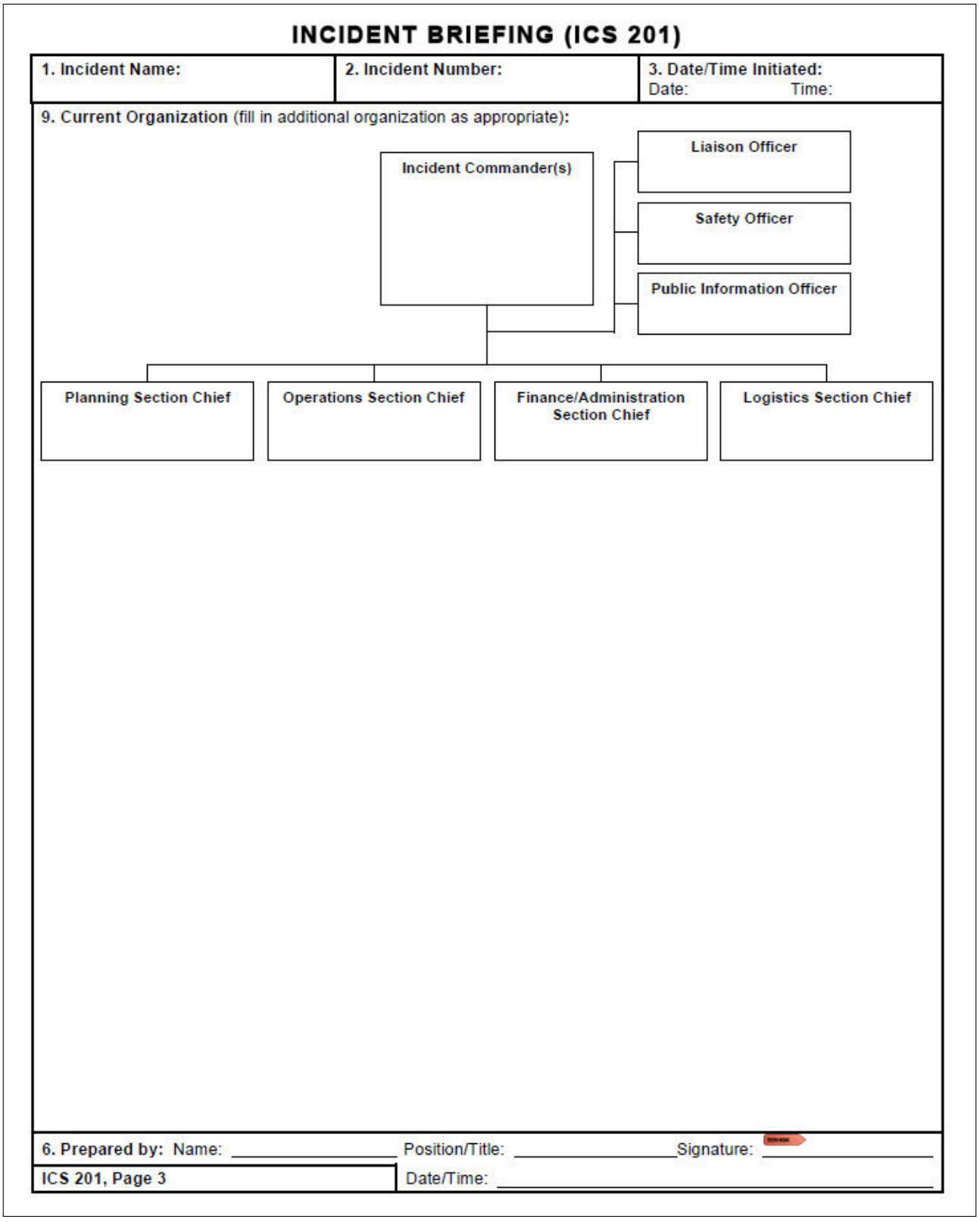


Figure 46.3: ICS 201—Page 3

INCIDENT BRIEFING (ICS 201)

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated: Date: Time:

10. Resource Summary:

Resource	Resource Identifier	Date/Time Ordered	ETA	Arrived	Notes (location/assignment/status)
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	
				☐	

6. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 201, Page 4 Date/Time: _____

Figure 46.4: ICS 201—Page 4

 Acronyms Topics

TOPIC 47

What is an ICS 214?

Incident personnel[1] should keep and complete an ICS 214 form—Activity Log—during their assignment, see Figure 47.1. The ICS 214 should be used to record significant events that the individual is involved in. For SAR operations these could include

1. Attending a briefing.
2. Starting a search assignment.
3. Finding a clue (including coordinates, description, and disposition).
4. Conducting a public contact/interview (including the name and contact information for the interviewed person).
5. Completing an assignment.

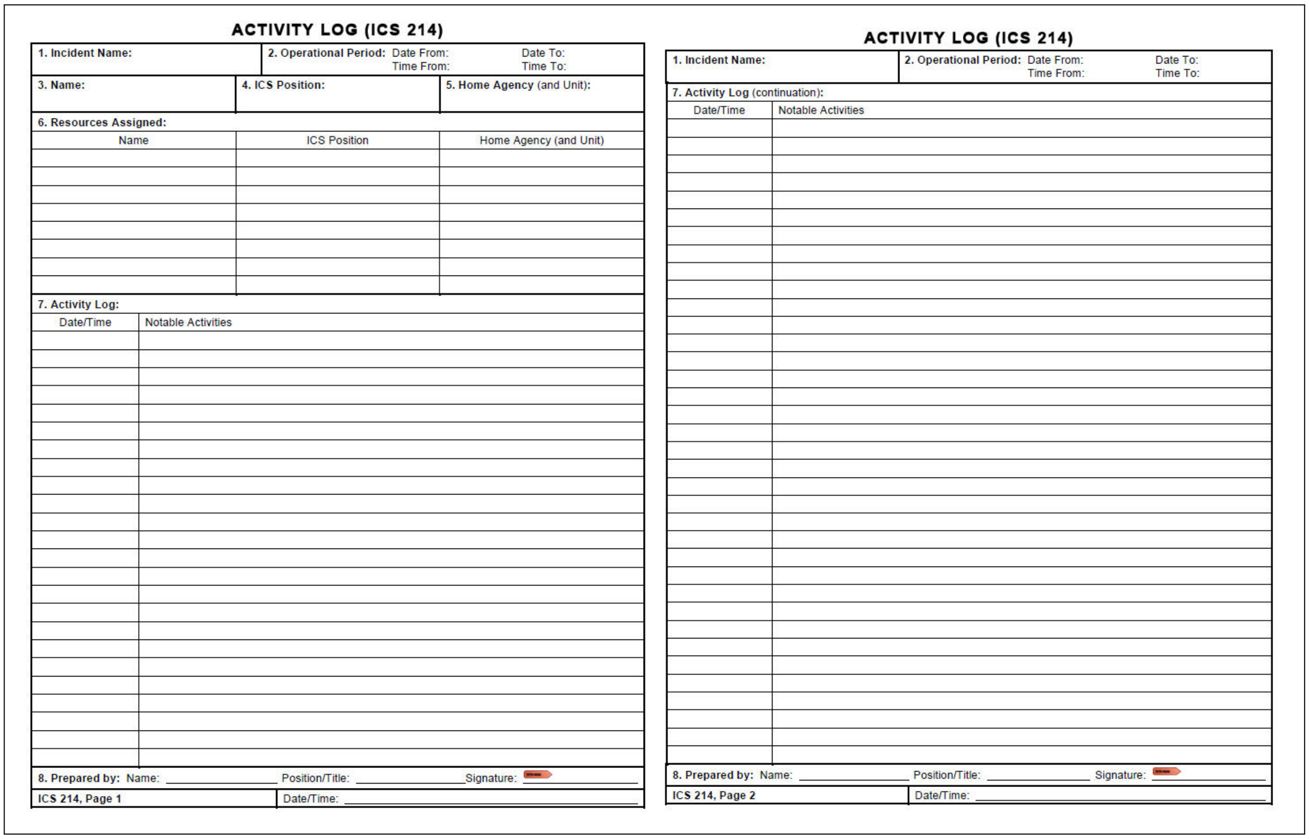
It is a good practice for the Planning Section of the Incident Management Team, see Topic 50 on page 106, to add specific instructions or questions to the ICS 214. This is designed to inform the individual of the information that is expected from them. The ICS 214, with the Incident Name and Operational Period completed, is then included in the Incident Action Plan, see Topic 51 on page 109, for that operational period. For example the following text could be included on the first line of the Activity Log (section 7):

"*Be prepared to discuss your assignment, any obstacles encountered, any communication problems, any hazards encountered, your critical separation distance, your probability of detection after completing your assignment, and any suggestions you have for future search efforts. Please record significant events or findings on this form and turn into Debriefing.*"

If completed properly, the ICS 214 provides valuable information for debriefing and for planning future operations. Personnel should be encouraged to use this form rather than a notepad or a note-taking app on a smartphone or tablet, because the ICS 214 is a standardized and recognized form for collecting the information needed. A completed ICS 214 that simply states "Conducted search assignment, found nothing." is not informative and provides little value to the planning process.

In addition to aiding in the planning and documentation for an incident, this form could be the only report that a SAR volunteer or other incident personnel may write. These forms may be used in legal proceedings so they should be completed thoroughly and professionally. The forms may be used to refresh SAR responders' memories prior to a deposition or other interview, especially if the interview takes place months or years after the incident occurred.

[1] Usually only Command and General Staff and all supervisory personnel, including team leaders, fill out an ICS 214.



ACTIVITY LOG (ICS 214)

1. Incident Name:
2. Operational Period: Date From: Date To: Time From: Time To:
3. Name:
4. ICS Position:
5. Home Agency (and Unit):
6. Resources Assigned:

Name	ICS Position	Home Agency (and Unit)

7. Activity Log:

Date/Time	Notable Activities

8. Prepared by: Name: ______ Position/Title: ______ Signature: ______
ICS 214, Page 1 Date/Time: ______

ACTIVITY LOG (ICS 214)

1. Incident Name:
2. Operational Period: Date From: Date To: Time From: Time To:
7. Activity Log (continuation):

Date/Time	Notable Activities

8. Prepared by: Name: ______ Position/Title: ______ Signature: ______
ICS 214, Page 2 Date/Time: ______

Figure 47.1: ICS 214

TOPIC 48

What is an AA?

The "Agency Administrator" (AA) is an ICS term for the person with the legal authority to manage the incident, frequently the chief executive officer (or designee) of the agency or jurisdiction that has responsibility for the incident. However, in some cases, laws may specify other positions that have that responsibility. Some Agency Administrators may assign "Agency Advisors", who have authority to make decisions on behalf of the agency. Usually the Agency Administrator is not on scene.

The AA delegates the authority to manage an incident to the Incident Commander. If the IC is not from the agency of jurisdiction, this delegation of authority should be written.

In a perfect world the role of the AA is one of support relying on the Incident Commander to make decisions, manage resources, and keep the lines of communication open. The Agency Administrator has an active role in the financial area of the mission and sometimes has the final say in mission suspension or continuation, on what resources may be utilized or requested, on what information is released to the public, and on the involvement and cooperation between other political entities. Communication between the Agency Administrator and the Incident Commander may take place one-on-one depending on the size of the agency, but in most cases they occur through some form of chain of command. Goals and objectives of the Administration are relayed to the Incident Commander in this manner.

In Arizona, the Agency Administrator of an incident that occurs in a county is the Sheriff of that county. If the incident occurs on National Park Service land then the Agency Administrator is the superintendent of that park.

Agency Administrator Expectations of the Incident Commander

- Have clear authority to manage the incident without interference and have knowledge of the agencies' policy. This may come from a delegation of authority in writing. Delegation of authority letters are not required when Incident Commander's normal position authority covers all the required activities. For example, it is not required when the Incident Commander is operating in their own jurisdiction.
- Provide competent and professional incident management using ICS/NIMS.
- Ensure the safety of responders and the public.
- Establish an Incident Command Post.
- Determine incident priorities, objectives and strategies.
- Approve and implement the Incident Action Plan.
- Provide regular, scheduled briefings/updates on the incident status and supervise debriefings.

 Acronyms Topics

- Provide timely notification of all significant events/occurrences.
- Approve requests for additional resources and release of resources.
- Coordinate activities of Command and General staff.
- Consult prior to making policy decisions that affect the agency's ability to achieve its mission.
- Have an approved plan for dealing with external influences, the media, suspension of the mission, and demobilization.
- Provide a complete, accurate incident documentation file.
- Ensure that a complete, effective After Action Review is conducted.
- Maintain Command presence and manage the incident to the best of their ability.

Incident Commander Expectations of the Agency Administrator

- Agency Administrator provides direction on policy and jurisdiction to the Incident Commander.
- Identify agency priorities/objectives for the incident.
- Establish management priorities and brief the Incident Commanderand Staff on
  - Management Objectives.
  - Policy Issues.
  - Priorities.
  - Key issues.
  - Stakeholders.
  - Political and Community Concerns.
  - Environmental threats.
  - Financial Constraints.
- Clarify authority and expected accomplishments.
- Determine the complexity of the mission and review daily with the Incident Commander.
- Complete an incident situation analysis and review it daily with the Incident Commander.
- Identify limitations and information guidelines.
- Supervise the Incident Commander and evaluate performance.
- Establish Multi-Agency Coordination and staff the Emergency Operating Center.

TOPIC 49

What is ICS?

This is a very brief introduction to the Incident Command System, ICS. For a more in depth understanding, either attend the ICS 100, 200, and 300 courses, or study Deal, T., de Bettencourt, M., Deal, V., Merrick, G., and Mills, Chuck. "Beyond Initial Response", 2nd Edition. Author House, Bloomington, IN. 2010.[1]

Homeland Security Presidential Directive 5 requires that all federal agencies use the Incident Command System to facilitate a national, coordinated response to domestic emergencies. A corresponding directive from then State of Arizona Governor Napolitano was issued stating that ICS will be used by all state agencies to manage all-hazard incidents, which includes SAR incidents.

According to Ken Hill, "*The first function to break down in the search for a lost person is the management function, and when this happens it affects virtually every component of the search operation, most especially and unfortunately its outcome. When the Incident Commander (IC) loses control of the incident, confusion reigns, tempers flare, the media gets hostile, and the search becomes a protracted and painful ordeal.*"

Symptoms that the management of a SAR incident is malfunctioning include

- Lack of accountability (including unclear chain of command and supervision).
- Poor communication (including radio and terminology problems).
- Lack of an orderly, systematic planning process.
- Being reactive rather than proactive.
- Lack of documentation detailing what has been done.

These problems can be mitigated by using the ICS. An ICS organization is modular and flexible.

- It is scalable. Initially there is usually only the Incident Commander in the organization, but as the incident becomes larger and more complex, the size of the organization grows. Then, as the incident winds down, the organization shrinks. So the organization expands and contracts as needed.
- The incident objectives determine the organizational size.
- Only functions/positions that are necessary are filled. The responsibilities of unfilled functions/positions are assumed by the immediate superiors.
- There is an orderly line of authority within the ranks of the incident management organization (Chain of Command).
- Every individual has one, and only one, designated supervisor to whom they report (Unity of Command).

The ICS provides consistent and efficient guidelines for the management of an incident, so that

[1] Some ICS courses are available online. See `http://www.training.fema.gov/is/crslist.asp`.

 Acronyms Topics

1. The roles and functions of the **Incident Management Team**, see Topic 50 on page 106, are clearly defined and coordinated ensuring that search management is a team effort.
2. **Sound Management Principles** are specified and used permitting leaders to maintain control of the incident.
3. **Common Terminology** is provided allowing people to communicate effectively.
4. All actions taken on behalf of the lost subject are goal-directed rather than resulting from isolated decisions: that is, they are driven by operational objectives, thereby contributing to an overall **Incident Action Plan** for finding the subject. See Topic 51 on page 109.
5. All decisions, clues, and activities are **Documented**. ICS provides a comprehensive set of forms for keeping a written record of the incident.

However, to quote Paul Anderson, "*in practice ICS is not as organized as it appears, and it often takes more than one operational period before all components of the system are synchronized.*"

 Acronyms Topics

TOPIC 50

What is IMT?

The Incident Management Team is the overhead team responsible for managing the search and devising an Incident Action Plan for finding the lost person. There are five basic functions that must be performed during the incident. See Figure 50.1.

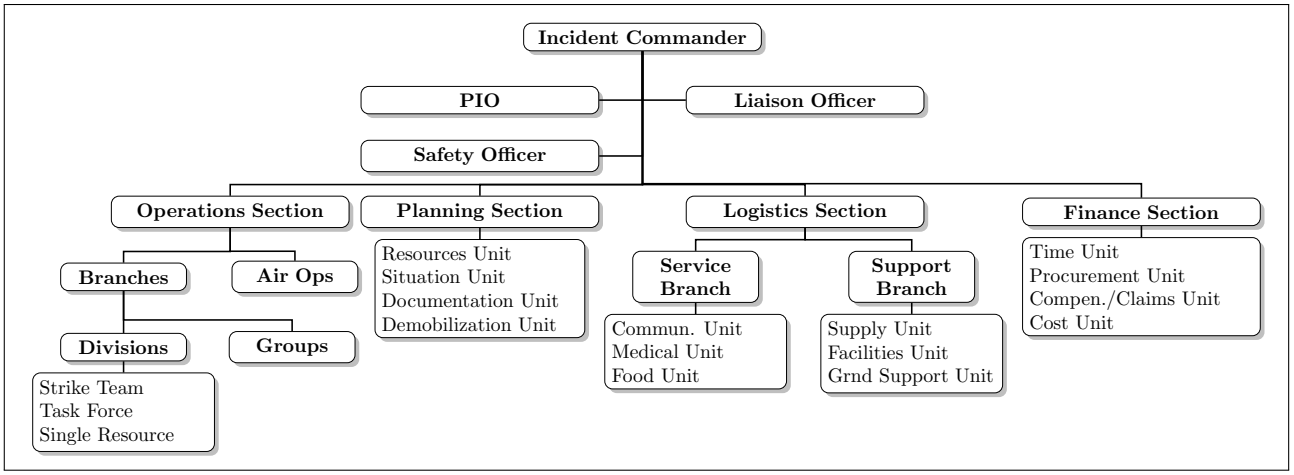


Figure 50.1: ICS Structure

1. **The Command Function**
   Although search management is a team effort, someone has to be responsible for leading the overhead team and overseeing all on-scene activities. The person who performs this function is called the Incident Commander. They set the Incident Objectives and ensure that other members of the overhead team implement those objectives. While they supervise the performance of other search functions (for example, decisions concerning search tactics), they do not become overly involved with any particular function, because this detracts from their ability to maintain "the big picture" on the incident. The Incident Commander delegates authority, but not responsibility.
   As needed, the Incident Commander delegates some authorities to the Public Information Officer, the Safety Officer, and the Liaison Officer.
   a) Public Information Officer (PIO). The PIO is responsible for interfacing with the public and media and/or with other agencies with incident-related information.

 Acronyms Topics

b) Safety Officer (SO). The SO monitors incident operations and advises the Incident Commander on all matters relating to operational safety, including the health and safety of emergency responder personnel.

c) Liaison Officer (LOFR). The LOFR is the point of contact for representatives of other governmental agencies, nongovernmental organizations, and/or private entities.

2. **The Planning Function**

Searching for a lost person involves gathering information (lost person data, witness reports, clues, weather forecasts, etc.) and, based on that information, acquiring and applying search resources (ground searchers, helicopters, dogs, etc.) to specific areas of the search. The Planning Section Chief (PSC) performs this function (in consultation with the Operations Chief and approved by the Incident Commander). They take the Incident Objectives (for example, "Confine the subject to within an area of 8 square miles." "Search high probability areas with a high probability of detecting the subject." "Find the subject before nightfall.") set by the Incident Commander and translates them into an operational strategy, including an assessment of the resources necessary to implement the strategy.[1] See Topic 9 on page 24.

For example, in an Area Search, see Topic 1 on page 10, they are responsible for segmenting the search area on a map and—based on a review of the behavior of past lost persons of a similar type—assigning probabilities that the subject is located within each segment; they decide where to set up containment points for keeping the subject from leaving the area; and they keep a careful record of the extent to which different segments of the search area have been searched.

Generally, the PSC is in charge of both documentation (keeping accurate records of search progress) and investigation (acquiring the information necessary to conduct a successful search).

As needed, the PSC delegates some authorities to the Resources, Situation, Demobilization, and Documentation Unit leaders.

a) Resources Unit Leader (RESL). The Resources Unit ensures that all assigned personnel and other resources have checked in at the incident. This unit keeps track of the current location and status of all assigned resources and maintains a master list of all resources committed to the incident.

b) Situation Unit Leader (SITL). The Situation Unit collects, processes, and organizes ongoing situation information. It prepares situation summaries, develops projections and forecasts of future events related to the incident, and prepares maps and gathers and disseminates information and intelligence for use in the IAP.

c) Documentation Unit Leader (DOCL). The Documentation Unit maintains accurate and complete incident files, including a complete record of the major steps taken to resolve the incident. It provides duplication services to incident personnel; and files, maintains, and stores incident files for legal, analytical, and historical purposes.

d) Demobilization Unit Leader (DMOB). The Demobilization Unit develops an Incident Demobilization Plan that includes specific instructions for all personnel and resources that require demobilization.

3. **The Operations Function**

The Operations Section Chief makes tactical decisions about how to apply available resources to implement the search strategy set by the IC.[2] For example, if the PSC wants a certain degree of coverage in a particular segment, the Operations Section Chief decides whether to use grid

[1] The PSC should consult and collaborate with the OSC in the development of strategies.

[2] Strategy involves the "big picture"—the overall plan, and how those plans will achieve the goals and objectives. A tactic is an action that leads to the execution of the strategy. For example, a strategy might be to search particular segments. The search technique used to search a particular segment is a tactic.

 Acronyms Topics

searchers, trackers, dog teams, aircraft, or some other search resource in order to complete the search strategy. They prepare the assignments and commit searchers to the field.

As needed, the Operations Section Chief establishes Divisions and Groups. Divisions are associated with physical or geographical areas of operation within the search area, for example, "Division A consists of Segments 1 through 7". Groups are associated with functional areas of operation for the incident, for example, the Medical Group or the Investigative Group.

4. **The Logistics Function**
   Logistics is an important supportive function. Someone has to ensure that searchers are fed and have a place to rest, that adequate transportation is available, that a communications system is established, that helicopters have a place to land, that medical services are available for injured searchers, and that order is maintained at the search base. Anything that is necessary to support the search incident is provided and supervised by the Logistics Section Chief.
5. **The Finance/Administration Function**
   The Finance/Administration Function is responsible for managing all financial aspects of the incident. Not all incidents require a Finance/Administration Section. The Finance/Administration Section Chief processes workers compensation claims, contracts, payment for paid personnel, and equipment time-keeping. These functions are very important and while the Finance Section Chief is not seen on many incidents the Incident Commander is responsible for making sure that these issues are handled. While less likely in a SAR incident the Finance/Administration Section Chief can have significant influence over strategy and tactics based on the money available for the incident.

 Acronyms Topics

TOPIC 51

What is an IAP?

All operational and logistical decisions are guided by reference to the Incident Action Plan (IAP), prepared by the incident management team for the next operational period. There is only one incident action plan per operational period, regardless of the number of agencies having jurisdiction or the number of different resources involved in the search. Basically, the IAP provides a framework for search strategy and tactics, keeps managers informed of the status of search resources, and encourages the incident management team to be proactive rather than reactive.

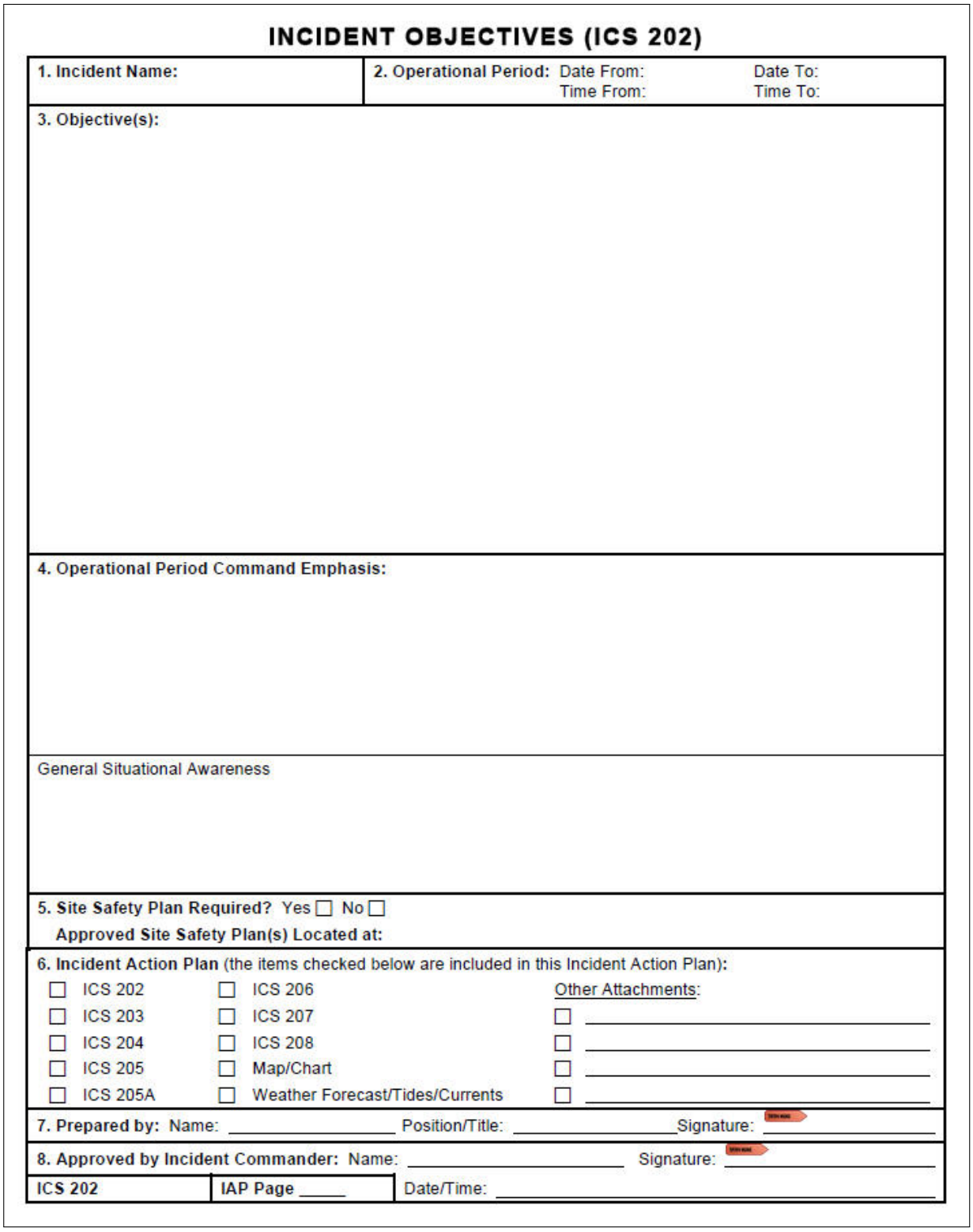
The most important components of the IAP are covered by adhering to the following order.

- What must be done? Identify the Incident Objectives by completing the ICS 202 form. Incident objectives can be prioritized by
  - Life and Safety. Objectives that deal with immediate threats to the safety of the public and responders are the first priority.
  - Incident Stabilization. Objectives that contain the incident to keep it from expanding, and objectives that control the incident to eliminate or mitigate the cause are the second priority.
  - Property/Environmental Conservation. Objectives that deal with issues of protecting public and private property, or damage to the environment, are the third priority.
- Who is responsible for doing it? Create an organization chart of the incident management team by completing the ICS 203 form.
- Who does what? Assign the resources by completing multiple ICS 204 forms.
- A safety message is a critical component in the IAP. The safety message covers safety issues that may arise during the incident based on the objectives, the resources used, the weather, the location of the incident, and fatigue related issues. This is included in the ICS 204 form.
- How do we communicate with each other? Create a communications plan by completing the ICS 205 form.
- What is the procedure if a searcher is injured? Create a medical emergency plan by completing the ICS 206 form.
- Where is it happening? Create a map of the search area.

The Incident Action Plan is updated during the current operational period for the next operational period.

Every incident, large or small, requires some form of an IAP. For most incidents that are small, the IAP is developed by the Incident Commander and verbally passed on to subordinates and assigned resources.

 Acronyms Topics



INCIDENT OBJECTIVES (ICS 202)

1. Incident Name:	2. Operational Period: Date From: Date To: Time From: Time To:

3. Objective(s):

4. Operational Period Command Emphasis:

General Situational Awareness

5. Site Safety Plan Required? Yes ☐ No ☐

Approved Site Safety Plan(s) Located at:

6. Incident Action Plan (the items checked below are included in this Incident Action Plan):

☐ ICS 202	☐ ICS 206	Other Attachments:
☐ ICS 203	☐ ICS 207	☐ _____
☐ ICS 204	☐ ICS 208	☐ _____
☐ ICS 205	☐ Map/Chart	☐ _____
☐ ICS 205A	☐ Weather Forecast/Tides/Currents	☐ _____

7. Prepared by: Name: _____ Position/Title: _____ Signature: _____

8. Approved by Incident Commander: Name: _____ Signature: _____

ICS 202	IAP Page _____	Date/Time: _____

Figure 51.1: ICS 202

 Acronyms Topics

ORGANIZATION ASSIGNMENT LIST (ICS 203)

1. Incident Name:	2. Operational Period: Date From: Time From:	Date To: Time To:

3. Incident Commander(s) and Command Staff:	
IC/UCs	
Deputy	
Safety Officer	
Public Info. Officer	
Liaison Officer	

4. Agency/Organization Representatives:	
Agency/Organization	Name

5. Planning Section:	
Chief	
Deputy	
Resources Unit	
Situation Unit	
Documentation Unit	
Demobilization Unit	
Technical Specialists	

6. Logistics Section:	
Chief	
Deputy	
Support Branch	
Director	
Supply Unit	
Facilities Unit	
Ground Support Unit	
Service Branch	
Director	
Communications Unit	
Medical Unit	
Food Unit	

7. Operations Section:		
Chief		
Deputy		
Staging Area		
Branch		
Branch Director		
Deputy		
Division/Group		
Division/Group		
Division/Group		
Division/Group		
Branch		
Branch Director		
Deputy		
Division/Group		
Division/Group		
Division/Group		
Division/Group		
Division/Group		
Division/Group		
Division/Group		
Division/Group		
Air Operations Branch		
Air Ops Branch Dir.		

8. Finance/Administration Section:	
Chief	
Deputy	
Time Unit	
Procurement Unit	
Comp/Claims Unit	
Cost Unit	

9. Prepared by: Name: _____	Position/Title: _____	Signature: _____
ICS 203	IAP Page _____	Date/Time: _____

Figure 51.2: ICS 203

 Acronyms Topics

ASSIGNMENT LIST (ICS 204)

1. Incident Name:	2. Operational Period: Date From: Date To: Time From: Time To:	3. Branch: Division: Group: Staging Area:

4. Operations Personnel: Name Contact Number(s)

Operations Section Chief: _____

Branch Director: _____

Division/Group Supervisor: _____

5. Resources Assigned:				
Resource Identifier	Leader	# of Persons	Contact (e.g., phone, pager, radio frequency, etc.)	Reporting Location, Special Equipment and Supplies, Remarks, Notes, Information

6. Work Assignments:

7. Special Instructions:

8. Communications (radio and/or phone contact numbers needed for this assignment):

Name/Function Primary Contact: indicate cell, pager, or radio (frequency/system/channel)

_____ / _____

_____ / _____

_____ / _____

_____ / _____

9. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 204 | **IAP Page** _____ | Date/Time: _____

Figure 51.3: ICS 204

 Acronyms Topics

INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1. Incident Name:	2. Date/Time Prepared: Date: Time:	3. Operational Period: Date From: Date To: Time From: Time To:

4. Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks

5. Special Instructions:

6. Prepared by (Communications Unit Leader): Name: _____ Signature: _____

ICS 205 | **IAP Page** _____ | Date/Time: _____

Figure 51.4: ICS 205

MEDICAL PLAN (ICS 206)

1. Incident Name:	2. Operational Period: Date From: Time From:	Date To: Time To:

3. Medical Aid Stations:

Name	Location	Contact Number(s)/Frequency	Paramedics on Site?
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

4. Transportation (indicate air or ground):

Ambulance Service	Location	Contact Number(s)/Frequency	Level of Service
			☐ ALS ☐ BLS
			☐ ALS ☐ BLS
			☐ ALS ☐ BLS
			☐ ALS ☐ BLS

5. Hospitals:

Hospital Name	Address, Latitude & Longitude if Helipad	Contact Number(s)/ Frequency	Travel Time		Trauma Center	Burn Center	Helipad
			Air	Ground			
					☐ Yes Level:____ ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
					☐ Yes Level:____ ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
					☐ Yes Level:____ ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
					☐ Yes Level:____ ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
					☐ Yes Level:____ ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

6. Special Medical Emergency Procedures:

☐ Check box if aviation assets are utilized for rescue. If assets are used, coordinate with Air Operations.

7. Prepared by (Medical Unit Leader): Name: _____ Signature: _____

8. Approved by (Safety Officer): Name: _____ Signature: _____

ICS 206	IAP Page _____	Date/Time: _____

Figure 51.5: ICS 206

 Acronyms Topics

TOPIC 52

What is a JAS?

A Job Action Sheet, or JAS, is a tool for defining and performing a specific emergency response functional role. A JAS is designed to clarify responsibilities. While regular planning, training, exercises and evaluation are necessary to ensure that members of the IMT are competent to perform their emergency response roles, having a JAS can help ensure that each responder understands and performs assigned duties according to plan.

To paraphrase the U.S. Department of Homeland Security

"*These Job Action Sheets do not cover other important traits of an effective PSC, such as:*

- *Good leadership, interpersonal and communications skills, or experience in risk-based decision making.*
- *A solid grasp of political, social, environmental, and economic issues.*
- *Experience in risk-based decision making and in-depth knowledge of substantive aspects of the incident at hand.*

 Acronyms Topics

Table 52.1: Initial Response Incident Commander Job Action Sheet ©2014

Initial Response Incident Commander (IRIC) Job Action Sheet

Reports to:	Agency Administrator
Mission:	• Responsible for all incident activities during the initial response period including development and implementation of strategic decisions and for ordering and release of all resources. • Ensure welfare and safety of incident personnel. • Supervises all responding resources. • Determine whether incident can be managed with personnel on scene/en route or if higher level incident management is needed.
Qualifications:	• Leadership ability. • Experience in responding to Search incidents as a supervisor of single resources, Task Forces or Strike Teams. • Ability to see "the big picture" and focus on those actions most important to achieving the desired outcomes. • Knowledge of local resources and geography. • Investigative experience.
Oversees:	• All initial response resources, including single resources, Task Forces, Strike Teams. • If appointed, supervises Investigators or Investigative Unit Leader. • If appointed, supervises Command and General Staff.
Immediate Actions:	• Focus on Investigation, Containment, and Search in that order. • Take the initial report, either from the Agency Dispatcher or from the Reporting Party and write it down, either on a Lost Person Questionnaire, the ICS 201, or the WinCASIE III Initial Note. ◦ Name and contact information of reporting party. ◦ How the report was received (telephone, person, etc.). ◦ Name of missing person. ◦ Thumbnail sketch of missing person. ◦ Circumstances of loss. ◦ Date and time last seen. ◦ Place Last Seen or Last Known Point (as precisely and accurately as possible). ◦ What does the reporting party think happened? ◦ What does the reporting party want you to do? ◦ What Instructions did you give to the reporting party (stay put, call back in an hour, use text messages only to communicate with cell phone, etc.)? • Check in with Agency Dispatcher, and on ICS 201, page 4. • When appointed as IRIC, communicate this to dispatcher and incident-related personnel. • Read this entire Job Action Sheet. • Mark the Initial Planning Point on your map. • Initiate further investigation using the Lost Person Questionnaire as a guide, and consider delegating these duties to an Investigator. • Designate an Incident Command Post and notify all personnel of the location. Mark location on the map, and make sure you don't leave it! • Put on position identification.

Initial Response Incident Commander Job Action Sheet continued on next page . . .

. . . Initial Response Incident Commander Job Action Sheet continued from previous page

- Assess Current Situation:
  - Determine Search Urgency.
  - Review Lost Person Behavior.
  - Review topography within the area defined by "distance traveled" in LPB and mark on map:
    - Hazards.
    - Barriers to travel.
    - Trails, and other travel aids.
    - Likely spots that might attract or hold the missing person.
  - Identify those resources immediately available to respond.
  - Conduct and record a scenario analysis. (Use Scenario Analysis worksheet.)
  - Consider the possibility of a criminal act.
  - Identify the potential "risks" to the missing person and to the searchers.
  - Consider history of other missing persons in the same area.
- Write 3–5 Initial Response Incident Objectives on ICS 201.
  - Continue investigation.
  - Contain the subject.
  - Locate and protect the PLS/IPP.
  - Determine direction of travel.
  - Search likely routes and locations.
  - Provide for responder safety!
- Choose a strategy or strategies to accomplish each objective.
- Define the Tasks to carry out the strategy(ies).
- Determine what kind and how many resources will be required to implement the Tactics.
- Identify any needed reporting locations/staging areas. Mark on the map.
- Order the required resources and begin tracking them on the ICS 201, page 4.
- Confirm dispatch and arrival times of activated resources.
- Brief and assign the initial response search resources.

Intermediate Actions:

- Keep the agency administrator and agency dispatcher informed of incident and response status regularly.
- Evaluate the initial response plan and track the resources' progress in achieving the Incident Objectives.
- Review the Investigative Task checklist (see Topic 12 on page 28) to ensure that all investigative tasks are being accomplished.
- Consider appointing and delegating work as necessary to Command and General Staff positions.
- Debrief the initial response resources as they complete their assignments. Reassign to additional tasks as appropriate.
- If it appears that the initial response resources will not be able to locate the missing person quickly, consider ordering additional resources.
  - Ensure ICS 201 and/or Initial Note are/is complete and accurate.
  - Set time and location for the Transition Briefing.
  - Conduct the Initial Briefing using the ICS 201 and other pertinent documents:
    - Lost Person Questionnaire.
    - Missing Person Flyer.
    - Clue Log.
    - Investigative information.

Demobilization:

- If needed, develop a Demobilization Plan based upon the needs of the incident.
- If needed, determine Release Priorities.
- If needed, implement the Demobilization Plan.
- Participate in the After Action Review.

Forms Prepared: ICS 201

Forms Approved: ICS 201

Meetings: Initial Incident Briefing, After Action Review.

Table 52.2: Incident Commander Job Action Sheet ©2014

Incident Commander (IC) Job Action Sheet

Reports to:	Agency Administrator
Mission:	• Responsible for all incident activities including development and implementation of strategic decisions and for approving ordering and release of all resources. • Ensure welfare and safety of incident personnel. • Supervise Command and General Staff.
Qualifications:	• Leadership ability. • Experience in managing complex Search incidents. • Ability to see "the big picture" and focus on those actions most important to achieving the desired outcomes.
Oversees:	• Safety Officer. • Information Officer. • Liaison Officer. • Operations Section Chief. • Planning Section Chief. • Logistics Section Chief. • Finance/Administration Section Chief.

Immediate Actions:	• Check in on ICS 211.
	• Obtain initial briefing from current Incident Commander and agency administrator.
	• Read this entire Job Action Sheet and review incident management organization chart.
	• Put on position identification.
	• Assess Current Situation:
	  ◦ Review the current situation status and initial incident objectives. Ensure that all local, State and Federal agencies impacted by the incident have been notified.
	• Recognize jurisdictional boundaries.
	  ◦ Determine need for, establish, and participate in Unified Command.
	  ◦ Co-located command post.
	  ◦ Unified and prioritized incident objectives.
	  ◦ Coordinated strategy.
	  ◦ Single coordinated IAP.
	  ◦ One Operations Section Chief (if activated).
	  ◦ Communications plan.
	  ◦ Resource ordering plan.
	• Activate appropriate Command and General Staff positions.
	• Confirm dispatch and arrival times of activated resources.
	• Confirm work assignments.
	• Announce Change of Command to all Incident personnel.
	• Develop and approve Incident Objectives.
	• Approve Incident Strategy.

	• Brief Staff:
	  ◦ Identify incident objectives and any policy directives for the management of the incident.
	  ◦ Provide a summary of current organization.
	  ◦ Provide a review of current incident activities.
	  ◦ Set time for initial planning meeting.
	• Establish level of planning to be accomplished:
	  ◦ Written IAP.
	  ◦ Contingency planning.

Incident Commander Job Action Sheet continued on next page . . .

. . . Incident Commander Job Action Sheet continued from previous page	

Intermediate Actions:	• Approve and authorize implementation of the IAP:
	  ◦ Review IAP for completeness and accuracy.
	  ◦ Verify that objectives are incorporated and prioritized.
	  ◦ Sign ICS Form 202.
	• Establish parameters for resource requests and releases.
	• Review requests for critical resources.
	• Confirm who has ordering authority within the organization.
	• Confirm those orders that require Command authorization.
	• Authorize release of information to the media.
	• Ensure Planning Meetings are conducted as directed.
	• Manage by wandering around incident to meet and discuss progress/problems with Command and General Staff.
	• Coordinate with key team members inside and outside the ICS Organization (Command and General Staff, Agency Administrator, EOC/MAC personnel, etc.) to ensure all aspects of the incident objectives are addressed.

Extended Actions:	• Evaluate progress.
	  ◦ Evaluate incident complexity.
	  ◦ Monitor tactical operations.
	  ◦ Compare actual progress to planned tactics.
	  ◦ Decide if plan will accomplish incident objectives.
	• Monitor safety and condition of all resources assigned to the incident, including the IMT.
	• Ensure Command and General Staff coordination:
	  ◦ Periodically check progress on assigned tasks of Command and General Staff personnel.
	  ◦ Approve necessary changes to objectives and strategy goals and IAP.
	  ◦ Ensure that Liaison Officer is making periodic contact with participating agencies.
	• Keep agency administrator informed on incident-related problems and progress.

Demobilization:	• Determine need for, and set time for Demobilization Planning Meeting. • Approve release priorities. • Approve final Demobilization Plan. • Ensure that all Command and General Staff receive performance evaluations. • Ensure that all required incident documentation is complete and accurate, and submitted to the Agency Administrator. • Participate in the After Action Review.
Forms Prepared:	ICS 202, ICS 213, ICS 214
Forms Approved:	ICS 202, ICS 209, Incident Action Plan, Contingency Plans, Demobilization Plan
Meetings:	Agency Administrator Briefing, Initial Incident Briefing, Initial UC Meeting, Strategy Meeting, Planning Meeting, Operational Period Briefing, Demobilization Planning Meeting, After Action Review.

Table 52.3: Planning Section Chief Job Action Sheet

Planning Section Chief (PSC) Job Action Sheet

Reports to:	Incident Commander
Mission:	• Oversee all incident-related data gathering and analysis regarding incident operations and assigned resources. • Conduct planning meetings. • Prepare the Incident Action Plan (IAP) for each operational period.
Qualifications:	• Ability to write Incident Action Plans. • Management experience. • Organized individual; able to think ahead about what is needed or may be needed during all phases of an incident.
Oversees:	• Resources Unit Leader. • Situation Unit Leader. • Documentation Unit Leader. • Demobilization Unit Leader.
Immediate Actions:	• Check in on ICS 211. • Receive appointment and briefing from the Incident Commander. • Review the current ICS 201 and/or IAP. • Read this entire Job Action Sheet and review incident management team chart (ICS 203/207). • Put on position identification. • Determine need for and appropriately appoint Unit Leaders, distribute corresponding Job Action Sheets and position identification. • Brief Planning Section Unit Leaders on current situation and incident objectives; develop response strategy and, with OSC, develop tactics; designate time for next briefing. • In consultation with the Incident Commander, establish the incident objectives and operational period. Initiate the Incident Objectives Form (ICS 202) and distribute to all activated positions. • Document all key activities, actions, and decisions in an Activity Log (ICS 214) on a continual basis. • Create preferred and alternative strategies. • Establish and maintain communications with Logistics Section Chief and Staging Manager to ensure the accurate tracking of personnel and resources. • Facilitate and conduct incident action planning meetings with Command Staff, Section Chiefs and other key positions to plan for the next operational period. Coordinate preparation and documentation of the Incident Action Plan and distribute copies to the Incident Commander and all Section Chiefs. • Ensure the Situation Unit Leader and staff regularly update and document status reports from all Section Chiefs and Unit Leaders. • Ensure Planning Section personnel comply with safety policies and procedures. • Document all communications (internal and external) on a General Message Form (ICS 213). Provide a copy of the General Message Form to the Documentation Unit.
Intermediate Actions:	• Meet regularly with the Incident Commander to brief on the status of the Planning Section and the Incident Action Plan. • Attend command briefings and meetings. • Continue to conduct regular planning meetings with Planning Section Unit Leaders, Section Chiefs, Command Staff, and the Incident Commander for continued update and development of the Incident Action Plan. • Ensure that the Planning Section is adequately staffed and supplied.

Planning Section Chief Job Action Sheet continued on next page . . .

	. . . Planning Section Chief Job Action Sheet continued from previous page
Extended Actions:	• Continue to monitor Planning Section personnel's ability to meet workload demands, staff health and safety, resource needs, and documentation practices. • Conduct regular situation briefings with Planning Section. • Continue to receive projected activity reports from Section Chiefs and Planning Section Unit Leaders at designated intervals to prepare status reports and update the Incident Action Plan. • Ensure the Demobilization Unit Leader assesses ability to deactivate positions, as appropriate, in collaboration with Section Chiefs and develops and implements a demobilization plan. • Ensure the Documentation Unit Leader is receiving and organizing all documentation, including Activity Logs (ICS 214) and General Message Forms (ICS 213). • Ensure your physical readiness through proper nutrition, water intake, rest, and stress management techniques. • Observe all staff and volunteers for signs of stress and inappropriate behavior. Provide for staff rest periods and relief. • Upon shift change, brief your replacement on the status of all ongoing operations, issues, and other relevant incident information.

Demobilization:	• As needs decrease, combine or deactivate positions in a phased manner.
	• Continue to meet with Command Staff, Section Chiefs and Planning Section Unit Leaders to evaluate facility and personnel, review the demobilization plan and update the Incident Action Plan.
	• Ensure collection of all documentation and Activity Logs from Command and Sections as positions are deactivated and sections demobilized.
	• Work with Planning and Finance/Administration Sections to complete cost data information.
	• Begin development of the After Action Review and assign staff to complete portions/sections of the report.
	• Debrief staff on lessons learned and procedural/equipment changes needed.
	• Upon deactivation of your position, ensure all documentation and Activity Logs (ICS 214) are submitted to the Documentation Unit.
	• Upon deactivation, brief the Incident Commander on current problems, outstanding issues, and follow-up requirements.
	• Submit comments to the Incident Commander for discussion and possible inclusion in an after-action report; topics include:
	  ◦ Review of pertinent position descriptions and operational checklists.
	  ◦ Recommendations for procedure changes.
	  ◦ Section accomplishments and issues.
	• Participate in stress management and after-action debriefings. Participate in other briefings and meetings as required.

Forms Prepared:	ICS 202, ICS 203, ICS 204, ICS 207, ICS 209, ICS 214, ICS 215
Forms Approved:	ICS 221
Meetings:	Initial Incident Briefing, Initial UC Meeting, Tactics Meeting, Planning Meeting, Operational Period Briefing, Demobilization Planning Meeting, After Action Review.

Table 52.4: Operations Section Chief Job Action Sheet

Operations Section Chief (OSC) Job Action Sheet

Reports to:	Incident Commander
Mission:	• Responsible for managing all operations directly applicable to the primary mission. • Activates and supervises organizational elements in accordance with the Incident Action Plan, and directs its execution. • Directs preparation of operational plans, requests or releases resources, makes expedient changes to the Incident Action Plan as necessary and reports such to the Incident Commander and Planning Section Chief.
Qualifications:	• Leadership ability. • Experience managing operations on smaller incidents as either IC or OSC. • Working knowledge of the ICS Planning Process.
Oversees:	• All operational resources, including, but not limited to: ◦ Branch Directors, Group/Division Supervisors, Task Force and Strike Team Leaders, Field Teams, Air Operations.
Immediate Actions:	• Check in on ICS 211. • Receive briefing from Incident Commander. • Review the current ICS 201 and/or IAP. • Read this entire Job Action Sheet and review incident management organization chart, ICS 203 and ICS 207. • Put on position identification. • Assess the incident operations • Participate in developing Incident Strategy. • Develop Tactical Plan (ICS 215) for the upcoming Operational Period. • Attend and coordinate the Tactics Meeting. • Assist the Safety Officer in completing the ICS 215A, IAP Safety Analysis. • Adjust operations as needed to most safely, effectively and efficiently accomplish the Incident Objectives. • Participate in the Planning Meeting. • Complete the ICS 220, Air Operations Summary as needed. • Present tactical assignments for all Operations resources at the Operational Period Briefing. • Document all internal communications on an ICS 213, and provide a copy to the Documentation Unit. • Complete the ICS 214 Unit Log.
Intermediate Actions:	• Meet regularly with the IC and PSC to brief on the status of operations, and progress toward meeting the Incident Objectives. • Attend all required meetings and briefings. • Adjust the existing Incident Action Plan as needed, and report changes to the IC and PSC. • Ensure that Operations Section staffing is adequate and appropriate to the needs of the incident. • Ensure that all Operations resources are fully briefed on Safety issues, and are operating safely. • Communicate regularly with the PSC, LSC, FSC, SO, and IC to share current information, resource condition and capability as well as progress in meeting the Incident Objectives. Help solve problems, and provide support. • Ensure that all Operations personnel submit their ICS 214's to the Planning Section, and get properly debriefed before going off duty.

Operations Section Chief Job Action Sheet continued on next page . . .

	...Operations Section Chief Job Action Sheet continued from previous page
Extended Actions:	• Monitor ongoing Operations to ensure that they are focused directly, and appropriately on meeting the Incident Objectives. Adjust as necessary. If there is a need for revised Incident Objectives or Strategy, immediately notify the Incident Commander. • Continue to monitor Operations Section's ability to safely meet workload demands, maintain acceptable span of control. Adjust as necessary. • Ensure your physical readiness through proper nutrition, water intake, rest, and stress management techniques. Observe all staff and volunteers for signs of stress and inappropriate behavior. Provide for staff rest periods and relief. • Coordinate the development, approval and implementation of transfer of duties when incident escalates/deescalates.
Demobilization:	• Attend and participate in the Incident Demobilization Planning Meeting. • Identify those resources that are no longer needed, and notify the Planning Section of excess resources. • Recommend release of Operations resources as the situation dictates and according to the release priorities approved by the Incident Commander. • Ensure that all Operations Section personnel receive performance evaluations. • Ensure all Operations Section documentation is submitted as required. • Participate in the After Action Review.
Forms Prepared:	ICS 213, ICS 214, ICS 215, ICS 220
Forms Approved:	None
Meetings:	Agency Administrator Briefing, Initial Incident Briefing, Strategy Meeting, Tactics Meeting, Planning Meeting, Operational Period Briefing, After Action Review.

Table 52.5: Logistics Section Chief Job Action Sheet

Logistics Section Chief (LSC) Job Action Sheet

Reports to:	Incident Commander
Mission:	• Responsible for providing facilities, services, resources, and material in support of the incident. • Participates in development of the Incident Action Plan. • Activates and supervises the branches and sections within the Logistics Section.
Qualifications:	• Experience in providing logistics support as a Unit Leader or Logistics Section Chief on smaller incidents. • Leadership and problem solving ability. • Innovative, with a positive, "can do" attitude.

Oversees:	• Service Branch Director.
	  ◦ Communications Unit Leader.
	  ◦ Medical Unit Leader.
	  ◦ Food Unit Leader.
	• Support Branch Director.
	  ◦ Supply Unit Leader.
	  ◦ Facilities Unit Leader.
	  ◦ Ground Transportation Unit Leader.

Immediate Actions:	• Check in on ICS 211.
	• Receive briefing from Incident Commander.
	• Review the ICS 201 or current IAP.
	• Read this entire Job Action Sheet and review incident management organization chart, ICS 203 or ICS 207.
	• Put on position identification.
	• Order and acquire, brief Logistics Section Unit Leaders on current situation and incident objectives, expected size and scope of the incident.
	• Collect information on current resources assigned, en route, on order, and local resource status including Initial Response as it relates to the Logistics Section. These information sources may include:
	  ◦ Agency dispatcher.
	  ◦ Initial Response Incident Commander, overhead, resource advisor, etc.
	• Obtain information on location, situations; for example, ICP/base locations, medical facilities, road closures, camp locations, etc.
	• Determine facilities established and operating.
	• Document all key activities, actions and decisions on an Activity Log, ICS 214.
	• Participate in preparation of the Incident Action Plan.
	• Ensure that ICS 205, ICS 206, Traffic Plan are completed.
	• Coordinate and process requests for additional incident resources.

Intermediate Actions:	• Manage Section personnel and activities for safe, timely service and support to the incident. Ensure the Section is adequately staffed and equipped. • Attend Strategy Meetings, Tactics Meetings, Planning Meetings, and Operational Period Briefings.

Logistics Section Chief Job Action Sheet continued on next page . . .

 Acronyms Topics

...Logistics Section Chief Job Action Sheet continued from previous page	

Extended Actions:	• Evaluate and monitor current situation.
	  ◦ Determine if current logistics capabilities will meet incident objectives.
	  ◦ Identify problems and concerns (evacuation, sheltering, aviation safety, etc.) for which logistics may be part of the solution.
	  ◦ Advise Incident Commander and other appropriate incident management team personnel.
	• Anticipate and identify kind, type, and number of resources required to achieve objectives.
	• Consider incident type and complexity, kinds and types of resources, resource availability, and safety factors.
	• Order necessary personnel and equipment.
	• Discuss long-range and contingency plans and identify potential and future resources' needs.
	• Ensure all personnel and equipment time records are complete and have been submitted to the Time Unit Leader/Equipment Time Recorder at the end of each operational period.

Demobilization:	• Participate in Demobilization Planning Meeting.
	• Coordinate with unit leaders and provide Planning Section Chief a list of excess personnel, contract equipment, crews, miscellaneous personnel and other resources. List will include:
	  ◦ Name/type.
	  ◦ Quantity.
	  ◦ Time/date of available release.
	• Review the list daily for accuracy ensuring that all units are demobilized in a timely and complete manner.

Forms Prepared:	ICS 205, ICS 206, ICS 214, Resource Orders
Forms Approved:	None
Meetings:	Strategy Meeting, Tactics Meeting, Planning Meeting, Operational Period Briefing, Demobilization Planning Meeting, After Action Review.

Part V
Miscellaneous

 Acronyms Topics

TOPIC 53

What is ASARCA?

On state lands in Arizona the responsibility for SAR lies with the Sheriff of each county as outlined in Arizona Revised Statute 11-441c which states "*The Sheriff shall conduct or coordinate within the county SAR operations involving the life or health of any person, or may assist such operations in another county at the request of that county's Sheriff, and may request assistance from any persons or agencies in the fulfillment of duties under this subsection.*"

This statute was adopted as a result of a search for a family in the desert between Cave Creek and Bartlett Lake in August of 1970 for an adult and four small children. The subjects were eventually all found deceased from exposure to extreme heat. Upon reviewing this incident the Arizona Legislature determined that no one entity was responsible or required to conduct searches such as this. In January of 1971 House Bill 10 added the SAR responsibility to ARS 11-441.

The Sheriffs of each county in Arizona have generally chosen to designate one or more deputy sheriffs as SAR coordinators for their county. The SAR Coordinators manage the day-to-day SAR operations.

There are approximately 40 SAR Coordinators throughout Arizona, and they are the core of the state-wide organization ASARCA, the Arizona Search and Rescue Coordinators Association.

This organization meets four times a year (in different parts of the state) so all the AZ SAR Coordinators from the 15 counties can discuss common issues including searches that went well, and those that did not.

It organizes a SAR conference for volunteers every 18 months, which is held in Heber. It also organizes various courses including

1. "Arizona Basic Search and Rescue", a 12-hour course, targets Sworn Officers and Volunteers that represent a government agency. It is an introduction to SAR in Arizona. The manual can be downloaded from `http://www.saraz.org/documents/AZBasicSAR.pdf`.
2. "Initial Response Incident Commander Wilderness SAR", a 12-hour course, is devoted to managing the Initial Response phase of searches for missing persons, primarily in wilderness

environments. It is designed to be used by prospective and experienced search coordinators, field park rangers who will lead the Initial Response, volunteers who are delegated the Initial Response Incident Commander responsibility, and other First Responders. The manual can be downloaded from `http://www.saraz.org/documents/IRIC.zip`.

3. "Inland Search Management for AZ SAR Coordinators", a 40-hour course, is devoted to managing searches for missing persons, primarily in wilderness environments. It is designed to be used by prospective and experienced search managers in conjunction with the software Win CASIE III. The manual can be downloaded from `http://www.saraz.org/documents/ISMManual.zip`. (See Topic 57 on page 132.)
4. "Search Planning Section Chief", a 32-hour course, addresses the knowledge and skills required to perform effectively as an ICS Planning Section Chief on a Type 3 Incident Management Team on a Land Search Incident. Participants use case studies, actual scenarios, and other classroom exercises to learn and practice the techniques and processes required to track incident resources; investigate, gather and analyze information regarding the missing person and the incident activities; develop search strategy; manage the Planning Cycle; evaluate tactical effectiveness; and document and demobilize a search incident. The manual can be downloaded from `http://www.saraz.org/documents/FindEm.zip`.

TOPIC 54

What is NASAR?

NASAR, the National Association for Search and Rescue, was founded in 1972 by the Western State Search and Rescue Coordinators, employees from the National Park Service, and other Emergency Managers. The initial focus was on education in Search Management: the theory of search, search planning, and the management of search incidents. Over the years, it has expanded its focus and its membership.

Now NASAR is a not-for-profit association dedicated to advancing knowledge in fields related to search and rescue. Membership is open to individuals and organizations involved in search and rescue operations and other disaster and emergency-response activities.

NASAR sponsors various SAR-related courses, such as

1. "Introduction to Search and Rescue", ISAR, which covers the general responsibilities, skills, abilities, and the equipment needed by persons who would be participating in a search or rescue mission. The course prepares students for SARTECH III certification.
2. "Fundamentals of Search and Rescue", FUNSAR, which is the sequel to ISAR. The course prepares students for SARTECH II certification.
3. "Managing the Lost Person Incident", MLPI, which is designed to teach the essential knowledge and skills necessary to perform as the initial response Incident Commander.

These courses are taught by NASAR-certified SAR personnel throughout the country. The fee for attending these courses varies.

NASAR holds an annual National Search And Rescue Conference, which attracts hundreds of SAR professionals. Participants have to register and pay for this 3-day event.

NASAR has an annual awards program ranging from a State Award (which recognizes significant contributions to search and rescue at the state level) to a very prestigious Hal Foss Award (which recognizes significant contributions to search and rescue at the national level). These awards are not restricted to NASAR members.

The late John Bownds, a member of SARA, received the NASAR State Award for Arizona in 1983 and the Hal Foss Award in 1991. These awards were for his work on search theory and for introducing *ROW* to the search community. John died in 1993, aged 51, from a disease contracted while searching for a lost person in the Sierrita Mountains, Arizona. In 2013 the Mountain Rescue Association recognized John's Line of Duty Death at their annual conference. See Topic 32 on page 71.

TOPIC 55

What is MRA?

MRA stands for Mountain Rescue Association. To quote from their website, `http://www.mra.org`:

> *The Mountain Rescue Association (MRA) was established in 1959 at Timberline Lodge at Mount Hood, Oregon making us the oldest Search and Rescue association in the United States.*
>
> *The MRA is an organization of teams dedicated to saving lives through rescue and mountain safety education. We do so by improving the quality, availability, and safety of mountain search and rescue. With over 90 government authorized units, the MRA has grown to become the critical mountain search and rescue resource in the United States.*
>
> *Membership in the MRA is by unit ONLY, there are NO individual memberships. If you are an individual looking to join an MRA team, find the team closest to you and contact them directly, ...*

 Acronyms Topics

TOPIC 56

What Is MLPI?

MLPI stands for "Managing the Lost Person Incident". The term MLPI is used in two different ways, depending on the context.

- MLPI is a manual published by NASAR, the National Association for Search and Rescue. It is an introduction to managing inland searches, ranging from hasty searches to large-scale, multi-operational-period searches. Until the early 1980s there were no manuals on inland search management. It was all done by seat of the pants and word of mouth. Then a group of experienced search managers met at the Grand Canyon, and out of that meeting emerged the first such manual, called "Managing the Search Function". In 1997, it was completely rewritten by Ken Hill, and renamed "Managing the Lost Person Incident". In 2007, the second edition of MLPI, sometimes called MLPI2, was published under the editorship of Dan O'Connor, the inventor of the O'Connor Consensus method.
- MLPI is a 32–40 hour course offered through NASAR that prepares the participants for managing SAR missions from the initial response to the final demobilization. The course is based on the MLPI manual, and covers the objectives, strategies, and tactics needed for a successful outcome to a SAR mission. It is taught by NASAR-certified SAR personnel, who must teach the course at least once every three years to retain certification.

 Acronyms Topics

TOPIC 57

What is ISM?

ISM stands for "Inland Search Management for AZ SAR Coordinators". It is a 400-page manual written by ASARCA members. (See Topic 53 on page 127). It can be downloaded from `http://www.saraz.org/documents/ISMManual.zip`. It is free.

It forms the basis of a 40-hour Arizona-specific course that AZ SAR Coordinators are required to take. About 70% of the course is hands-on and it incorporates SAR software throughout. The manual and PPTs can be updated between courses, so it is always up-to-date and is very flexible.

Writing the first edition of the manual (2011), which took about a year, was a multi-county, multi-agency effort, by the following people.

Roial Armstrong, Yavapai County Sheriff's Office (now retired)
Aaron Dick, Coconino County Sheriff's Office
Mike Ebersole, National Park Service (Retired)
Mike Friend, Mohave County Sheriff's Office (now retired)
Eric Johnson, Pima County Sheriff's Department
James Langston, Arizona Department of Emergency and Military Affairs (now retired)
David Lovelock, University of Arizona, Win CASIE III, and SARAZ.ORG
Rob McEuen, Mohave County Sheriff's Office (now retired)
Dave Noland, Cochise County Sheriff's Office
Ken Phillips, Grand Canyon National Park (now retired)
Ursula Ritchie, Cochise County Sheriff's Office
Jesse Robinson, Maricopa County Sheriff's Office (now retired)
Barry Scott, Arizona Department of Emergency and Military Affairs (now deceased)

As of July 2016, ISM was at the 8th edition. Additional contributers include

Paul Anderson, National Park Service (Retired)
Jeff Newnum, Yavapai County Sheriff's Office, AZ

 Acronyms Topics

TOPIC 58

What Books on SAR are Worth Reading?

Educational

- **Deal, Tim et al.** "Beyond Initial Response", 2nd Edition. Author House, Bloomington, Indiana. 2010.
- **Dougher, Hugh.** "Search Management Systems". ERI International, Inc., Olympia, Washington. 2008.
- **Gilmartin, Kevin M.** "Emotional Survival For Law Enforcement". E-S Press, Tucson, Arizona. 2002.
- **Glaus, Ronald.** "The Psychology of Search and Rescue". Inkwater Press, Portlans, Oregon. 2014
- **Kelley, Dennis.** "Mountain Search for the Lost Victim". Published privately. 1969.
- **Lois, Jennifer.** "Heroic Efforts". NYU Press, New York, New York. 2003.
- **McGrayne, Sharon.** "The Theory That Would Not Die". Yale University Press, New Haven, Connecticut. 2012.
- **O'Connor, Dan**, editor. "Managing the Lost Person Incident", 2nd Edition. National Association for Search and Rescue. 2007.
- **Perkins, Dave.** "Probability of Detection (POD) Research, And Other Concepts For Search Management". Emergency Response Institute, Olympia, Washington. 1989.
- **Perkins, Dave and Roberts, Pete.** "Searching for a Missing Person. Managing the Initial Response. A practical handbook". The Centre for Search Research, Northumberland, UK.
- **Setnicka, Tim J.** "Wilderness Search and Rescue". Appalacian Mountain Club, Boston, Massachusetts. 1980.
- **Shimanski, Charley.** "Working with the Media in Search and Rescue". Mountain Rescue Association. 2008. Downloadable from `http://www.mra.org/drupal2/sites/default/files/documents/training/Media_rev08.pdf`. Accessed January 27, 2011.
- **Syrotuck, William G.** "Analysis of Lost Person Behavior". Barkleigh Publications, Mechanicsburg, Pennsylvania. 2000.
- **Syrotuck, William G.** "An Introduction to Land Search—Probabilities and Calculations". Barkleigh Publications, Mechanicsburg, Pennsylvania. 2000.

- **Syrotuck, William G.** "Some Grid Search Techniques for Lost Individuals in Wilderness Areas". Barkleigh Publications, Mechanicsburg, Pennsylvania. 2001.
- **United States Department of Defense.** US Army Survival Manual: FM 21-76. 1970. `www.ar15.com/content/manuals/FM21-76_SurvivalManual.pdf`.

Narrative

- **Blehm, Eric.** "The Last Season". Harper Perennial, New York. 2006.
- **Butler, Elias and Myers, Tom.** "Grand Obsession: Harvey Butchart and the Exploration of Grand Canyon". Puma Press, Flagstaff, Arizona. 2007.
- **Bytnar, Bruce W.** "A Park Ranger's Life". Wheatmark, Tucson, Arizona. 2010.
- **Farabee, Charles R. "Butch".** "Death, Daring and Disaster—Search and Rescue in the National Parks". Roberts Rinehart Publishers, Boulder, Colorado. 2005.
- **Ghiglieri, Michael P. and Myers, Thomas M.** "Over the Edge: Death in Grand Canyon". Puma Press, Flagstaff, Arizona. 2001.
- **Hufault, Cathy.** "Death Clouds on Mt Baldy". Arizona Mountain Publications, Vail, Arizona. 2011.

Mathematical

- **Koopman, Bernard O.** "Search and Screening". Military Operations Research Society, Alexandria, Virginia. 1980.
- **Stone, Lawrence D.** "Theory of Optimal Search". INFORMS, Linthicum, Maryland. 1989.
- **Washburn, Alan R.** "Search and Detection", 4th Edition. INFORMS, Linthicum, Maryland. 2002.

TOPIC 59

What are Some of the Acronyms used in SAR?

AA	Agency Administrator. Chief executive officer (or designee) of the agency or jurisdiction that has responsibility for the incident. The designee might be the person to whom the IC reports. Usually the Agency Administrator is not on scene.
AAR	After Action Review. An AAR is a mechanism designed to evaluate an incident in order to improve performance by encouraging strengths and correcting weaknesses.
AFRCC	Air Force Rescue Coordination Center
ASARCA	Arizona Search and Rescue Coordinators Association.
ATL	Attempt to Locate.
BOLO	Be on the lookout. All-points bulletin.
C&G	Command and General Staff.
CERT	Community Emergency Response Teams
COA	Certificate of Authorization. Currently for a public safety agency to operate a UAS the agency needs to apply for and receive a Certificate of Authorization from the Federal Aviation Administration (FAA).
CPOD	Cumulative Probability of Detection. The probability of multiple independent resources detecting the subject in a segment, assuming the subject is in that segment. It is a measure of how well the segment has been searched.
DMOB	Demobilization Unit Leader.
DOCL	Documentation Unit Leader.
GAR	Green-Amber-Red. GAR Risk Assessment Model. A risk assessment model that creates a "Go"–"No Go" decision tool.
GIS	Geographic Information System. A GIS integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.
GISS	Geographic Information System Specialist.
GPS	Global Positioning System. Based upon satellites, this device gives exact locations using latitude and longitude.

 Acronyms Topics

IAP Incident Action Plan. An oral or written plan containing general objectives reflecting the overall strategy for managing an incident. There is only one IAP for each operational period.

IC Incident Commander. The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources.

ICP Incident Command Post. The field location at which the primary tactical-level, on-scene incident command functions are performed.

ICS Incident Command System. A standardized on-scene emergency management system. Also, Investigate, Contain, Search—which dictates the order of initial actions.

IMT Incident Management Team. Under ICS, the IMT consists of the IC, the Command Staff, and the General Staff.

IPP Initial Planning Point. The first LKP or PLS.

IRIC Initial Response Incident Commander.

ISM Inland Search Management.

JAS Job Action Sheet.

LKP Last Known Position. The last known location of the missing subject determined by physical evidence such as a vehicle, a discarded object, or a footprint.

LOFR Liaison Officer. Sometimes abbreviated LNO.

LPB Lost Person Behavior. An analysis of how lost subjects behave by putting them into different categories.

LPQ Lost Person Questionnaire. A written document that describes all available physical and mental characteristics of a lost person.

OP Operational Period.

OSC Operations Section Chief.

PIO Public Information Officer.

PLB Personal Locator Beacon.

PLS Place Last Seen. The location where the missing subject was actually seen by another person.

POA Probability of Area. POA applies to every segment and the ROW. The POA of a segment is the probability that the subject is in that segment taking into account all the searches that have taken place within the search area.

POD Probability of Detection. The probability of a resource detecting the subject in a segment, assuming the subject is in that segment and is immobile. It is a measure of how well the segment has been searched by that resource.

PPE Personal protective equipment. Equipment worn to minimize exposure to serious workplace injuries and illnesses.

PSC Planning Section Chief.

RESL Resources Unit Leader. Sometimes abbreviated RUL.

ROW Rest of the World. The ROW is the probability that the subject is outside the search area taking into account all searches that have taken place inside the search area.

SITL Situation Unit Leader. Sometimes abbreviated SUL.

SO Safety Officer. Sometimes abbreviated SOFR.

SARA Southern Arizona Rescue Association.

UAS Unmanned Aerial System.

UC Unified Command is an element in multi-jurisdictional or multi-agency domestic incident management. It provides guidelines to enable agencies with different legal, geographic, and functional responsibilities to coordinate, plan, and interact effectively without giving up their statutory or jurisdictional authority and obligations.

YABI Yet Another Brilliant Idea.

Index

F

G

H

I

J

K

L

M

N

O

P

R

S

T

U

V

W

Y

