ROYAL CANADIAN ARMY CADETS

GOLD STAR

INSTRUCTIONAL GUIDE

SECTION 6

EO C425.02 – ANALYZE PROBLEMS USING AN EXPEDITION CASE STUDY

Total Time:	270 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-704/PG-001, *Gold Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the Case Study Worksheet located at Attachment A. One copy is required for each cadet and each group.

There are eight case study examples located at Attachment B. The difficulty level of the case study increases by number. If attempting a case study for the first time, it is recommended that a lower number case study be chosen. Select a case study to use, become familiar with it and photocopy it for each cadet.

A case study may generate a lot of class discussion. Keep the discussion on track. Develop a list of open-ended questions to use throughout the activity. Some examples of open-ended questions are:

- How did you make that choice?
- What would you do differently?
- Why do you feel that way?
- What do you think would have happened if…?
- What does that mean to you?
- Is there another way of looking at it?
- Why is that important?

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A case study was chosen for this lesson as it allows the cadet to analyze problems using expedition case studies.

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INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have analyzed problems using an expedition case study.

IMPORTANCE

It is important for cadets to analyze expedition-based problems. Using expedition case studies is a great way to help build better judgment and decision-making skills. Real-life cases can be analyzed and problems / issues debated without the risk of poor decisions causing harm. Using case studies helps to build confidence to make decisions later.

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Teaching point 1 **Have the cadets complete an expedition case study activity.**

Time: 80 min Method: Case Study



CASE STUDY

In the case study method, the cadet is provided with the opportunity to consider a real-life situation. Cadets respond to a scenario by examining the facts and incidents of the case, to critically analyze data and develop solutions. Facilitate by guiding the cadets toward answers.

The method is used to challenge cadets to apply what they know to a real situation.

Using expedition-based cases is a great way to help build judgment and decision-making skills. Real-life cases can be analyzed and problems / issues debated without the risk of poor decisions causing harm. Using case studies helps to build experience.

The process is a learning opportunity. In some cases, the correct decision is rarely obvious and in many cases several different solutions could work, provided they are implemented correctly—the goal is to develop skills.



The case study method works best with relatively small groups of relatively mature cadets. The primary objective is not to find a correct solution to the problem(s) but to understand the principles involved.

ACTIVITY

Time: 80 min

OBJECTIVE

The objective of this activity is to have the cadets analyze problems using an expedition case study.

RESOURCES

- Case Study Worksheet located at Attachment A (one per cadet and one per group),
- Case Study located at Attachment B (one per cadet), and
- Pens / pencils.

ACTIVITY LAYOUT

Set up the area with tables and chairs for both individual and group work.

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ACTIVITY INSTRUCTIONS



Timings may have to be adjusted, depending on the productivity of the cadets.

1. Conduct a briefing, to include an explanation of:
   a. the objective and importance of the activity; and
   b. the resources required to perform the activity.
2. Summarize the case study that will be analyzed during the activity.
3. Distribute a Case Study Worksheet, the case study and a pen / pencil to each cadet.
4. Allow 25 minutes for the cadets to read the case study and complete the Case Study Worksheet.
5. Divide the cadets into groups of no more than three.
6. Distribute a Case Study Worksheet to each group.
7. Allow 20 minutes for the cadets to share and discuss the answers from their Case Study Worksheets. Each group will record their group answers on the Case Study Worksheet.
8. Rotate from group to group to verify that the cadets understand the issues and answer any questions.
9. Allow 25 minutes for the cadets to discuss their answers with the entire class.
10. Elaborate on the main points through well-formed, pre-planned questions. Guide the cadets through the facts, assumptions and problems of the case study. Direct them to the cause of the problem, as well as the consequences. Lead the cadets from issue to issue and discuss critical points.
11. Conduct a debriefing on the activity by asking:
    a. if it was difficult for the group to solve the problems in the case study (why / why not);
    b. what issues were difficult to decide on;
    c. why some decisions were more difficult to make than others;
    d. how some of the issues identified in the activity relate to issues that have occurred on a previous expedition(s), if any;
    e. what three words you would use to summarize what you learned from completing this activity; and
    f. how this information can assist you when planning an expedition.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in analyze problems using an expedition case study will serve as the confirmation of this TP.

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END OF LESSON CONFIRMATION

The cadets' participation in the case study will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

The case study is a way to apply known concepts to a real situation. The process is a learning opportunity. In some cases, the correct decision is rarely obvious and in many cases several different solutions could work, provided they are implemented correctly—the goal is to develop skills. It is a great way to think about problems that could occur, while analyzing how they could also be prevented.

INSTRUCTOR NOTES / REMARKS

An experienced instructor shall be chosen to instruct this lesson.

This EO may be conducted as many as three sessions of three periods each during Gold Star training.

REFERENCES

A0-055 A-P9-050-000/PT-006 Director Training and Education Policy. (2002). *Canadian Forces manual of individual training and education* (Vol.6). Ottawa, ON: Department of National Defence.

C2-208 ISBN 978-1-59485-033-2 Raynolds, J., Lodato, A., Gordon, R., Blair-Smith, C., Welsh, J., & Gerzon, M. (2007). *Leadership the outward bound way*. Seattle, WA: The Mountaineer Books.

C2-250 Leemon, D., & Schimelpfenig, T. (2005). *Risk management for outdoor leaders: A practical guide for managing risk through leadership*. Lander, WY: National Outdoor Leadership School.

C2-252 ISBN 1-929148-54-2 Ajango, D. (2005). *Lessons learned II: Using case studies and history to improve safety education*. Eagle River, AK: SafetyEd: Safety Education for Outdoor and Remote Work Environments.

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CASE STUDY WORKSHEET

Case Study Title: _____

Name / Group: _____

Read the case study individually and answer the four questions below. When combined into groups, each group will be required to discuss their answers and record group answers. If extra room is required, use the back of the sheet.

1. A **fact** is something that is known to have occurred. Identify five facts that led to problems in this case study.

•
•
•
•
•

2. An **assumption** is something that a person takes or accepts to be true, without proof, for the purpose of argument or action. Identify five assumptions you believe led to problems in the case study.

•
•
•
•
•

3. A **problem** is a doubtful or difficult matter requiring a solution. Identify three major problems that occurred throughout the case study. Once identified, use the column on the right side to rank each problem from the most serious (# 1) to the least serious (# 3).

•	
•	
•	

4. A **solution** is an act or means of solving a problem or difficulty. Develop solutions to the problems identified in Question 3.

Solution to Problem #1
Solution to Problem #2

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Solution to Problem #3

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CASE STUDY #1

FORGOTTEN BATTERIES AFFECT EVACUATION

Narrative:

Three summer camp backpacking leaders were preparing for a week-long trip. They had worked with each other several times before and were looking forward to getting out of the camp and into the field. While the campers were at the lake, the leader, Sam, and his co-leaders, Sally and Bob, worked on putting together the gear in the main office. They gathered maps, first aid kits, batteries, radios and field paperwork while they reviewed student profiles and medical histories, looked at maps while chatting about the route, the chance for good fishing and maybe a peak climb. While this was going on, Bob, an avid Red Sox fan, tuned into the team's game with the New York Yankees on the television.

"Hey, the Red Sox are up by two in the sixth. Great! I hate the Yankees," Bob said.

Sam wrestled with first aid kits, watching the game intermittently as the noise of the crowd or Bob made it clear that something interesting was happening. Sally inventoried the maps and asked if they needed any route information from the climbing guide. No one answered, so she said, "Hey guys, leave the game for a minute and help me finish. Do we need the guide?"

"Naw," said Sam. "The peak is a walk. I've done it several times. Don't forget the batteries. If we don't have an evacuation, we can use them in the Walkman."

Sally commented that the radio uses batteries quickly and the spare set is essential.

Bob asked about the checklist. He didn't see it in the paperwork.

"I hate that thing," said Sam. "We never needed it until those airheads forgot the maps last summer."

Sam searched around, found the checklist, checked off its items, initialled it, and stuck it in his pocket. "Done. What's up with the game?" The trio finished their prep work with the game in extra innings and the dinner bell ringing.

"Grab the stuff, and let's go. I'll get the batteries and the maps," Bob said. He placed the batteries on the couch and turned his attention to the television, where the Yankees just took the lead from the Red Sox. "Cripes, the Yankees are the evil empire, but they win and win."

They left the room and the next morning for the field.

Two days and about 15 km (9.5 miles) up the trail, Sally fell while crossing some deadfall and badly fractured her left lower leg. It was clear they needed medical support. Sam asked for the radio. Bob quickly dug it out of his pack and tried to turn it on. The batteries were dead. Sally didn't have the spares, nor did Sam. Bob had a sudden vivid image of the batteries on the couch in front of the television.[1]

[1] From *Risk Management for Outdoor Leaders: A Practical Guide for Managing Risks Through Leadership* (p. 42), by D. Leemon & T. Schimelpfenig, 2005, Lander, WY: National Outdoor Leadership School.

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CASE STUDY #2

AN INAPPROPRIATE CALL FOR HELP

Narrative:

Four students were hiking 20 minutes ahead of the staff, enjoying a well-earned afternoon of independent travel. Along the way, one student tripped on a tree root and fell forward, striking her head on the ground. Momentarily stunned, then scared, she began to hyperventilate. Two of the other students in the group dropped their packs and ran back to the staff, telling them about the injury.

When they arrived on the scene, the staff found the injured student breathing rapidly and complaining of tingling in her hands and a headache. She seemed disoriented and agitated. They decided this was a severe head injury and called to request a medical evacuation. The cell phone connection was inconsistent, coming in and out, and they drained their batteries relaying the first request for immediate rescue.

After things settled down, the staff performed a more careful assessment of the student. One of them recognized that the student was hyperventilating and scared. The instructors wanted to alert the life flight, but the cell phone was dead. Unfortunately, the life flight had a serious mechanical problem during the flight and had to perform an emergency landing, winding up in a deep valley and out of radio contact. The sheriff had to send a plane to search for the first helicopter and a second helicopter to respond to the original call for help. The student was transported to the hospital where she was quickly assessed and released with a small bruise on her head.[2]

[2] From *Risk Management for Outdoor Leaders: A Practical Guide for Managing Risks Through Leadership* (pp. 39–40), by D. Leemon & T. Schimelpfenig, 2005, Lander, WY: National Outdoor Leadership School.

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CASE STUDY #3

STUDENT LEFT ALONE IN REMOTE TERRAIN

Narrative:

Twelve students and two instructors decided to hike to the summit Mount Fester. The route began with 365 m (1 200 feet) of gentle, open slopes and ended with the summit cone consisting of 60 m (200 feet) of challenging Class Three boulder hopping. During the climb, the group became spaced out with one instructor at the front and the trip leader in the back with the slower students. One student in the rear began to complain of having a headache and feeling dizzy and nauseous. The leader yelled to the students ahead to let the instructor in front know that he was stopping. The message was slowly passed up the line, and it reached the instructor when she was at the base of the challenging cone. The message she heard was, "You go ahead; I'll be up later." There was no mention of an ill student.

Over the course of the next half hour, the leader had the ill student drink water and eat some snacks. He reported feeling better but not strong enough to continue the climb. The leader left him with a sleeping bag and headed up the peak. The leader met the rest of the group. They had not reached the summit because the instructor had decided it was too difficult to supervise 11 students on her own on the difficult terrain.

The leader thought he might be able to make it to the top with a smaller group. He told the instructor to pick up the ill student during the descent to camp. The leader then continued to the summit with two students.

The instructor, however, did not find the resting student. She figured the student might have returned to camp on his own, but when she and her group arrived at camp, the ill student was nowhere to be found. The instructor then climbed back up the mountain to search for him.

During this time, the other leader and his group descended to camp by a different route. When he got to camp and learned about the situation, the leader returned on his own to the location where he had left the student. The missing student was still there, sleeping. He said he felt fine and returned to camp. An hour later, the other instructor and her search group returned to camp.[3]

[3] From *Risk Management for Outdoor Leaders: A Practical Guide for Managing Risks Through Leadership* (pp. 40–42), by D. Leemon & T. Schimelpfenig, 2005, Lander, WY: National Outdoor Leadership School.

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CASE STUDY #4

GROUP LOST ON FIRST DAY OF EXPEDITION

Narrative:

Charlie and Henry, wilderness instructors for a wilderness program, arrived with their students at their planned drop-off point late one afternoon. The previous day, preparation day, had been difficult for the instructors. Henry, the trip leader, had been assigned to the course at the last minute, and was not happy about it. He complained about leading adolescents and suspected that this assignment was punishment for complaints about his previous trip, on which students said he was short-tempered, distant and difficult to approach.

During the preparation day, Henry criticized Charlie for miscalculating the amount of stove fuel they would need. Then, after Charlie had evenly distributed the group's gear, Henry reorganized all of it in front of several staff members while grumbling about poorly-trained new staff. Charlie's explanation that he had divided the gear as instructed fell on deaf ears.

The drop-off point was in thick forest with rolling hills and few distinct landmarks. As the van pulled away, Charlie and Henry looked at their maps and prepared to hike to the "X" (the destination for camp) in separate groups. Henry pointed to where they were, and marked an "X" where he wanted them to meet in a few hours. Charlie was concerned. He didn't think they were starting where they thought they were. He mentioned this to Henry, who replied irritable, "No, we are at the correct spot. I've been here several times before."

Unconvinced, Charlie used his Global Positioning System (GPS) receiver and plotted their position. It showed they were 700 m (2 300 feet) northeast of where they thought they were on the map. He pointed this out to Henry who bluntly replied, "I don't need that crutch. I can read a topographical map."

Henry then left with his group and Charlie left about a half hour later. After walking through a maze of two-track dirt roads, Charlie was convinced they were disoriented and pulled out his GPS. Using this he navigated to the "X," arriving at dark. The other group was not there. Charlie did not know what else to do, so he made camp. In the meantime, Henry hiked to his "X," and of course Charlie was not there.

Charlie waited that night and all of the next day for Henry to arrive. Henry also waited for Charlie, and at noon the next day he hiked with his group back to the drop-off point thinking that Charlie would return there. When Charlie did not show up that evening, Henry called the base on his cell phone (Charlie didn't have one) and said he had lost a group. He was obviously irritated and complained about these "new instructors who can't navigate."

The support staff at the base plotted on a map the coordinates Henry gave them for the "X," and arranged for an aircraft to fly one staff person over the area first thing in the morning. After their second pass over the area, they saw a bright flash of light coming from a small clearing—it was Charlie. Support staff contacted a very irritated Henry on his cell phone and told him Charlie was in the right place waiting for him.[4]

[4] From *Risk Management for Outdoor Leaders: A Practical Guide for Managing Risks Through Leadership* (pp. 42–43), by D. Leemon & T. Schimelpfenig, 2005, Lander, WY: National Outdoor Leadership School.

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CASE STUDY #5

RAPPELLED OFF THE END OF THE ROPE

Narrative:

An instructor (Tyrell) and student (Beth) were rappelling from the top of Block Tower. The first rappel was tricky because the end of the rappel could not be seen from the top anchor and belay. Knowing that Beth would be out of sight and that communication would be difficult, the instructor gave Beth explicit instructions on what to do and what to expect. He described the rappel route in detail, including what the next rappel station would look like and how to clip into the anchor bolts.

Beth said she understood the instructions and, although she was tired, Tyrell believed she had been attentive. As Beth rappelled, he used the belay to judge when Beth would reach the anchor. Beth stopped at the anticipated belay point, then, after a few moments pause, continued to slowly descend. The belay slack disappeared and then the belay loaded. To Tyrell, it was obvious that Beth had just rappelled off the end of her rope.

Tyrell was able to tie off the belay rope and remove himself from the belay anchor. He then secured the belay rope and prepared to descend on the rappel line. This took about 10 minutes. He rappelled to a ledge where he could walk out to its outer edge and look down. He saw Beth hanging well below the ledge of the next rappel station with the rope passing directly over the anchor bolts. Tyrell quickly descended to the anchor at the second rappel station and clipped in. It was now clear that Beth had in fact rappelled directly over the anchor and, after stopping and looking at it, had for some reason continued downward.

Beth was hanging against a vertical face and could not climb up. Tyrell built an anchor and set up a pulley system using the free rappel line. He raised her to a small ledge where she could stand and then placed her on belay so she could climb an easy part of the face to his ledge. He then clipped her in, took apart the raising system and climbed back to the anchor above. After returning to the ledge, they continued to descend without incident.

Beth had no real explanation of why she continued rappelling. This was not her first multi-pitch climb, and she had previously shown attentiveness to details and reliability. She said she stopped and looked at the anchor but was having a good time rappelling and was "spacing out." She said, "It was feeling really neat," so she continued to rappel.[5]

5 From *Risk Management for Outdoor Leaders: A Practical Guide for Managing Risks Through Leadership* (p. 39), by D. Leemon & T. Schimelpfenig, 2005, Lander, WY: National Outdoor Leadership School.

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CASE STUDY #6

PARTICIPANT KILLED IN AN AVALANCHE

Narrative:

At 9:30 am on Day Five of a 10-day backcountry ski trip in Wyoming, a group of 11 students and two leaders set out to ski 5 km to the base of Patterson Peak. They planned to break trail for their next campsite, and once there, they would mound snow for snow shelters (they had planned to move into this camp the next day).

Willy, one of the leaders, was at the front of the group. Dave, the other leader, was at the back of the group, about 15–20 minutes behind. During the morning, as they crossed some flat areas, Dave felt a collapse of the snow pack. He did not think it was indicative of any instability in the snow pack, however, and did not mention it to Willy.

About mid-morning, the group broke out onto a 20-degree open slope, facing north-northeast. They could see that it extended uphill about 30 m (100 feet), gradually increasing in steepness up to a tree band. Above the band of trees and not immediately obvious to the leaders or anyone else in the group, the slope steepened for about 120 m (400 feet) as it rose to a cliff band. Willy decided that neither the slope nor the snow pack was a danger. He made a gradual descending traverse across the slope to the valley bottom and the future camp location and the rest of the group followed.

Willy and Dave discussed whether to return by the route they had come or break a different trail back to the existing camp. Willy liked the route they had just travelled. Dave wanted to avoid crossing the same slope. He felt it would be difficult for students carrying full packs and pulling sleds when they moved camp the next day. While he did not say so, he was also concerned about a slope on the route that he thought posed an avalanche danger, and this, along with the collapsing snow he felt earlier, made him want to establish an easier route back. The two instructors had a brief conversation about which route to take but failed to reach a decision. For the next hour and a half, they busied themselves making snow shelters.

At about 1:40 pm, a student, Steve, came to Willy and Dave complaining of pain in his feet. Willy inspected Steve's feet and decided that the group needed to head back to camp. Again, Willy and Dave discussed the route. Willy felt that using the already broken trail would be more efficient and would allow them to get Steve back to camp more quickly. Dave concurred.

Willy started out leading the group back on the existing trail, and Dave brought up the rear. Willy re-emphasized to the group what to do in the event of an avalanche, including skiing downhill, struggling to stay close to the surface, and creating an air pocket. Though Willy did, by now, recognize the slope as a possible avalanche slope, he didn't think it was threatening, and so he didn't establish spotters or have the students ski across one at a time.

When Willy got across, he turned to watch the students. Suddenly he head a sound (like a crack) from up slope, and looking up, he saw the avalanche. He yelled at the students in the slide path—five of them—to "ski down!" Steve was already out of the way. Denise easily skied out of the path. Frank and Molly skied downhill and to the side, but were caught by the avalanche.

Roger looked at the avalanche and then at Willy, and then waved his arms and yelled. He did not attempt to ski down out of the slide path, even though he was a capable skier. The slide caught Roger and carried him down slope. He was on the surface for 6–8 m (20–25 feet) before being buried.

When the snow stopped moving, Frank was buried to his chest and Molly was buried to her waist. Willy saw that Frank and Molly were not in imminent danger; he focused his attention on Roger.

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About five or six minutes after the slide ended, Willy located Roger by using an avalanche transceiver and quickly uncovered his face. Roger was buried about 1 m (3 feet) under the surface. He was completely encased in snow and was not breathing. There was no pulse. Rescue breathing was begun immediately and chest compressions were started as soon as his chest could be uncovered. The efforts were continued for two hours. Unfortunately, they were unsuccessful.[6]

6 From *Risk Management for Outdoor Leaders: A Practical Guide for Managing Risks Through Leadership* (pp. 44–46), by D. Leemon & T. Schimelpfenig, 2005, Lander, WY: National Outdoor Leadership School.

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CASE STUDY #7

ADAM'S STORY

Narrative:

In the summer of 1998, Adam Dzialo was 12 years old. He loved sports and was good at everything he played. When he wasn't playing a sport, he was at a sports camp. Adam's family had a busy summer planned for him. He was signed up for six sports camps, including hockey camp which was going to be his first week away from home and Team Adventure, an outdoor program run by the local community college. The Team Adventure brochure promised "five days of fun and excitement!" featuring a ropes course, rock climbing, canoeing, hiking, a river crossing and one overnight camping trip.

The Team Adventure activities were designed to introduce participants to different types of outdoor skills or experiences each day. On many of the earlier trips, participants complained about the Friday hike—it wasn't exciting enough. Heather and Patrick (the team leaders) asked for permission to alter the itinerary for the group and try a river swimming and rescue drill instead. Permission was granted. The group would hike to the summit on Thursday and on Friday, a hike to Deerfield River, where the group would complete river activities.

On Friday morning, the group broke camp and headed for the river, stopping briefly along the way to get the water release time. The river's flow was controlled by scheduled water releases from the nearby dam. Heather and Patrick wanted to time their activities so that they could be finished before the full force of water hit the group. Before the release, the river is a shallow stream. Afterward, it rises gradually and progressively as a bubble of water makes its way down the riverbed.

After obtaining the water release time, the leaders knew they had a few hours, so there was no need to rush. The group stopped for lunch and the leaders discussed how to read water and fitted everyone with life jackets. They tested each jacket by attempting to lift it over the person's head. At just under 90 pounds, Adam was a little small for an adult-sized life jacket, but it passed their test and they decided it was an acceptable fit.

The chosen location seemed like an excellent choice for a swimming and rescue drill, and had been used for that kind of activity many times by multiple organizations. On the bank, the group was split into two teams. The swimmers went upstream with Patrick while the rescuers went downstream with Heather. They were about 60 m (200 feet) apart.

Upstream, Patrick provided a briefing for the swimmers, explaining where to swim, the proper position, how to grab the throw bag, and what to do if the throw bag missed. It had been predetermined that before each boy went, Patrick would look both ways and give a thumbs-up sign to Heather to indicate he was ready. When Heather returned the sign, the swimmer would be free to go.

Downstream, Heather explained the proper use of throw bags to her group and positioned two rescuers near her side along the bank. The plan was that if the first throw bag missed the swimmer, the second person would throw their bag.

No one was required to participate and some opted out.

During mid-afternoon, the leaders brought the group together. Patrick had to drive someone upstream to meet his mother at a prearranged pick-up point. He was expected to be back in 10 minutes. Heather said she felt comfortable continuing the exercise, so some people went back upstream to take another run at the river. Heather stayed downstream with the rescuers. The signalling system would be the same, but the swimmers would decide for themselves when to enter the water.

When it was Adam's turn, the full release from the dam had arrived and commercial rafts, with guides, were beginning to appear. Adam floated in the water in a seated position. He waved to his friends downstream and then appeared to stand up. His body flipped over and he then disappeared under the water.

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Heather ran upstream along the shore and tried to swim out to Adam. The current forced her back downstream. During the next few minutes, several rafting guides were ashore and joined the rescue operation. Several attempted to reach Adam. All of them were swept away by the current. Some of the guides tried to create a "human chain" to reach him, but the current was too strong.

With the aid of rope, the group created a "tag line" and a few minutes later Adam was reached. One guide was able to get a firm grip on Adam's life jacket. He let go of the rope and pulled as hard as he could. He was able to pull the life jacket free, but Adam's foot was lodged.

Because there was too much slack in the tag line, trees were added as anchor systems and additional ropes were used to pull the tag line taut. Four men attached a raft to the line across the river and manoeuvered it as close as they could to where Adam was trapped. They were finally able to get Adam's head above water and could start rescue breathing. Two other men worked to pull Adam's foot free. He had been under the water for 25 minutes.

Patrick had returned, several people had called 911 and emergency personnel had already arrived on the scene. Within minutes, Adam was transferred to an ambulance, carried to a nearby heliport and flown by helicopter to a hospital.

After the first 72 hours, the doctors told Adam's family that he would live. However, they held very little hope for a full recovery. Adam had suffered from "anoxic encephalopathy" as a result of the near drowning—the neuromuscular system that controls movement had been damaged.

After the accident, now 19 years old, Adam needs assistance with every aspect of daily living. He attends physical therapy five times a week, speech therapy four times a week and Advanced Biomechanical Rehabilitation exercises three times a week. He communicates with his eyes, laugh and smile. He cannot walk. His parents remain optimistic that he will, one day, walk and talk again.[7]

[7] From *Lessons Learned II: Using Case Studies and History to Improve Safety Education* (pp. 5–26), by D. Ajango, 2005, Eagle River, AL: SafetyEd: Safety Education for Outdoor and Remote Work Environments.

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CASE STUDY #8

SEA KAYAKERS STRANDED IN DARKNESS AND FOG

Twelve kayakers and two instructors pushed off on the final expedition day of the Boundless Experiences Inc. eight-day kayaking course at Rigarogy Island, in the waters of southern Ireland's Baltimore Bay. The distance for the day of paddling from Rigarogy Island to Cleare Island was approximately 35 km (20 miles) among the islands of the bay, with several crossings of open water. There were many small craft warnings for southwest winds of 27–37 km per hour (15–20 knots). The waves were choppy and up to 1 m (3 feet) high and rain was in the forecast. In addition, the group had had a few nights of short sleep.

Shannon, the assistant trip leader, checked in with the six women and six men in the group, who ranged in age from 19–58, while they were preparing breakfast to give a pep talk and assess their physical condition as well as their spirits. She then reported to Zachary, the very experienced 40-year-old leader. They discussed the plans for the day, and he made the judgment call that, even though the weather conditions, travel distance, and group fatigue levels were not ideal, the group would go ahead with the schedule and have the final expedition day, which would be led by the students. Though all of the students received appropriate training, Zachary and Shannon knew that, given the weather conditions, they would need to stick pretty close behind the students when paddling, just in case assistance was required.

A couple of hours later after launching, the fleet of four single and five two-person kayaks were heading west across open water, Nash (in a single kayak) capsized. Instead of staying in close convoy with the rest of the group, he had once again split off from the group. But he successfully performed a wet exit, and the crew rallied quickly to get him back into his kayak. His boat was then pumped dry and the crew continued on, arriving at Hare Island, the lunch destination, at 1:30 pm.

At lunch, Zachary and Shannon wanted to update the base on the group's progress, but also wanted to save the two-way radio's batteries for emergency use because the very high frequency radio's rechargeable batteries had not been swapped at the start of the expedition for ones that would maintain charge for longer. Zach decided to use his cell phone to call the base and change the estimated time of arrival from 3:00 pm to 5:00 pm. No one answered, so he left a message and planned to call again later in the afternoon.

At 2:30 pm, Shannon tried to reach the base, this time with the radio, but had no luck. Most students opted to wear wetsuits for the rest of the day. At 3:00 pm, the crew ensured there was no trace of the visit left at the site and the group set off. There was approximately 13 km (8 miles) farther to the base.

By late afternoon, it was raining hard. The group was approaching the end of a channel, so they rafted up so that they could check their maps and compasses, since, as had often been the case, they were having trouble agreeing on exactly where they were and what course to follow.

The group made good time heading southwest past a string of small islands, though were still behind schedule. At 5:30 pm, Zachary moved up ahead of the students, taking the lead and urging everyone to keep up the pace behind him.

By 7:30 pm, the sun became lost behind the clouds and fog could be seen. There was still 5 km (3 miles) left. Twenty minutes later, in the fog and dwindling daylight, the group decided to tighten the convoy, leaving only about 30 m (100 feet) between the front and back of the line. There were wind and waves coming in from the south—the direction of travel.

Zachary called the group together and checked to see how everyone was doing and whether everyone was prepared to make the final push. He was familiar with the area and estimated that it would take 10 minutes to cross the area. None of the students spoke up.

Zachary gave the group the heading of 180 degrees magnetic and firmly stressed the need to maintain a close convoy formation. Kelly, who was tired and concerned about the coming darkness, asked that another, stronger two-person kayak be appointed to stick close beside her and her partner, but Zachary reassured her that the entire group would be sticking together, so such a buddy system would not be needed.

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A few minutes before 8:00 pm, the group was enveloped in fog and waves. Although the wind had somewhat dropped, Zachary (guided by his compass, which was mounted on his kayak) headed the convoy, with Shannon in the middle of the back half. There was now approximately 12 m (40 feet) between the front and back of the kayak line. There was a green buoy ahead to the left, but the group could not make out its number. Zachary believed it was buoy Number 13, which confirmed his sense that the group was right on course.

By this time, darkness and fog had made it impossible for Zachary to read his compass, so he tried to use the direction of the parallel rows of incoming waves as a navigational aid. He was unaware that there were refracting waves—a condition in which the lines of waves make an arc as they swing past a point of land. The result was that the waves were coming in more from the west rather than south, as Zachary was predicting.

With the size of the waves, the group was having trouble maintaining the close convoy without bumping into each other. It was also difficult to see everyone, so the group started shouting back and forth to maintain contact.

Zachary called Shannon up to his kayak to ask her to try to read his compass. The compass indicated that the group was heading west, rather than south. To make sure, Zachary borrowed a hand-held compass from the closest kayak. The compass confirmed that the group was 90 degrees off course. By this time Zachary, like the rest of the group was stretched pretty thin from fatigue, and possibly dehydration, so it was understandable when he turned his kayak around and headed north for a few minutes. He did a 180-degree turn, and the group followed him south, continuing to use voice contact to keep together.

Soon the group could only hear the sound of waves crashing into rocks. Zachary shouted for all of the kayaks to gather. Two two-person kayaks did not show up, and the rest of the group, already quite apprehensive, were screaming back and forth as they tried to bunch the kayaks together while they bounced and dipped into the waves. The students were starting to panic.

A minute or two later, at about 8:30 pm, a flare illuminated in the gloom. Zachary told Shannon to remain with the pod of kayaks, and, shouting and blowing his whistle, he rapidly set off toward the rocks in search of the missing students. Moments later he found one of the kayaks next to a rocky ledge. Martin and Margaret told him that the two women from the other kayak, Kelly and Ruth, were standing on the ledge with their kayak pulled up beside them, and that they had set off the flare. Zachary told Martin and Margaret to paddle back to the others, using whistles and shouts as a guide.

Zachary could now see Kelly and Ruth's silhouettes on the ledge, so he yelled to them to ask if they were okay. They replied that they were okay and able to stay on the ledge, in spite of the rising tide and the breaking waves. Zachary assured them that they would be helped off the ledge as soon as possible.

Zachary returned to the rest of the group and briefed them on the situation. He then tried to get his jacket and flashlight out of his rear hatch and the two-way radio from under his rear deck. He retrieved the radio and called the base. In an even voice, he informed the volunteer on duty of the situation and requested that a motor vehicle be quickly sent to assist. It was now approximately 9:00 pm. Zachary called to check on the rescue efforts and was informed that a motor vehicle was on the way. By 9:45 pm, there were still no sign that help was on the way.

Twenty minutes later, Shannon set off an emergency flare. The group could make out a large motor vehicle coming toward them. All group members were rescued.

Careful assessment by senior staff members determined that none of the students or instructors would need medical attention.[8]

[8] From *Leadership the Outward Bound Way* (pp. 213–219), by J. Garrett, 2007, Seattle, WA: The Mountaineers Books.

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