This document will introduce the content and the recommended presentation structure for survey orientated training complimentary to recognised aviation Crew Resource Management (CRM) training – Inter-departmental Survey Crew Resource Management (SCRM) training.

The intent of this guideline is to address the SCRM training recommendation in Section 3.9 of the IAGSA Safety Manual and to provide guidance for the incorporation of the typical survey crew structure, support staff and operational environment into aviation CRM training.

Inter-departmental SCRM can be conducted either as part of a recognised aviation CRM course or following recognised aviation CRM training.

The document is structured in two parts: Section 2 will discuss the wider aims and the organization aspects of the training, and Section 3 will discuss how the presentation should be presented to employees.

*This document is intended as a guideline only!*

### Revision History

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What does SCRM mean?

SCRM will teach employees who are going to work on field survey crews how to cooperate and work well with crew members from various departments (AMEs, geophysicists, pilots, and technicians).

In the case of companies that provide aircraft with flight and maintenance crews working for a geophysical survey provider, who in turn contracts that service to a resource sector client, it becomes more challenging. This scenario requires that the member company or companies, as often both the aircraft provider and the geophysical survey provider are IAGSA members, should coordinate SCRM with the resource sector client and ensure that all personnel are working co-operatively understand the principles and objectives of SCRM.

Crew/Cockpit Resource Management was initiated over 20 years ago to enhance safety of flight operations, and is best understood as a system that teaches the optimal usage of available resources; including personnel, equipment and procedures.

What is the Aim of the SCRM Training?

Crew Resource Management has proven to be an effective tool for ensuring safe and efficient operations. A well developed and implemented SCRM program will help teach field crews to identify and utilize all available resources for an efficient, safe, and positive work environment. Due to the nature of survey companies’ work, and the longer working hours and personal pressure that the field environment creates, training of this nature can better prepare crews for the challenges they will face. By presenting the training inter-departmentally, with a focus on group work and communication, employees will learn how to understand and identify these challenges and work through the resolution process in a positive learning environment.
Training Structure

This section will discuss the recommended organizational issues for presenting the training.

Training Duration:

The instructor should allow for approximately three hours. It should be noted that CRM training can take much longer than this and that recognised aviation CRM training can take at least 1-2 days. The instructor should be mindful that while allowing ‘free thought’ and wide ranging discussion to occur, he/she should still make an effort not to go too far over the time to ensure continued audience interest.

Training Audience

The training should typically have not more than approximately 15 to 20 participants from all departments. This number should include people who have been to the field and people who are preparing to go to the field for the first time. A wide range of experience is also recommended, but the instructor should make sure not to allow the experienced people to dominate the training. In some scenarios, with separate aircraft/crew providers working with both the geophysical survey provider and their client, it may be necessary to conduct field SCRM training with all employees prior to the job start.

Recommended Materials

The layout of the room should be arranged in a ‘U’ shape with the moderator in front rather than having a classic layout where some people are facing the back of others. This will allow for better discussion and interaction between attendees.

An electronic presentation (ppt, odt) can be used (with moderation!) to show the topics and to structure the training. A board to write down important points during the course is suggested to vary the visual media and to facilitate interaction.

Attendees will not be encouraged to take notes during the training. Pens and paper should be provided for the scenarios.
Teaching Style

The education style used by the instructor must be adapted for an adult, experienced and skilled audience (see ‘andragogy’ on http://en.wikipedia.org/wiki/Andragogy). Three basic concepts need to be followed in order to maintain the highest learning effectiveness:

1. Each individual needs to understand and adhere to the learning objectives and recognize the importance of this training to improve efficiency. This point needs to be made at the beginning of the training.

2. At any time during the lesson, the attendees must know where they are in the big picture of the training course, where they are going, what is the next step and virtually feel they are in control of the pace.

3. In order to successfully assimilate new material, adults need to directly link the new information to their own personal experience. This is best achieved by asking questions rather than giving answers. The matter covered in this training is already somewhere in the general knowledge of the attendees. What needs to be done is to extract and structure this knowledge and recognize its importance.

Instructor Selection

Selecting an appropriate instructor is important for the course. The instructor should be familiar with the subject of SCRM, but also be very familiar with the challenges that the crew will face. The instructor must be confident enough to give a presentation as well as guide the discussion and interject as needed.

An experienced crew member who is familiar with giving presentations would be ideal. However, the instructor must be careful not to inject too much personal experience into the discussion, but rather to use his or her experience as a means to guide the discussion.

Preparation is the key to a successful training course. The Instructors Notes in this document will help the instructor to prepare primary questions for each topic that will be covered and, as the discussion moves forward, help him or her to react accordingly to the attendee participation.
Section 3: Training Content

Introduction (15 minutes)

Instructors Notes
The purpose of the introduction is to make sure the attendees understand and adhere to the objectives of the training. This is best achieved when the participants themselves can point out the need for this training and make a real effort to consider what should be covered and what would be useful for them. However, you have to guide them and give enough input and feedback to make sure they are on the right track. Once they have given some answers and you feel they understand what will be presented, you can present the structure you prepared and the content of the presentation.

Proposed Approach
After a general introduction by the instructor, consisting of a, “Thank you for coming to this course, my name is __________.”

The instructor should address the following two points.

1. Emphasis on the interaction needed from participants. This includes:
   - Acknowledge the experience and the expertise of the audience and express the interest in making that experience useful to the others.
   - Explain your role as a moderator to structure the training and guide the discussions and their essential participation in the process. The training’s calibre will be directly proportional to the calibre of each participant.

2. The Aim of the SCRM training with objectives and expected outcome.
   - The instructor should ask, ‘Just by reading the title, what do you expect to be talking about during this presentation? What impact do you feel it will have on survey operations? (The instructor will have to make sure to direct the answers
so as to make sure the audience understands that SCRM involves ‘human’ resources management.

- Have someone write down the answers from the audience on the board to compare it at the end of the training or refer to it once in a while during the training.

- Finally, present the structure of the presentation you prepared, the proposed sequence of events and how much time will be allocated to each topics.

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**Definition of the field survey environment (20 minutes)**

**Instructors Notes**

In this section, you want to focus on the reality experienced by each individual during a survey. You start with easy, rational questions comparing their office duties with their field work (extrospective) and then you expand on their personal experience (introspective). When a participant introduces the cultural shock, you can present the typical stages. You can also introduce the emotional stages of a separation with your loved-one, your kids, etc. You finish this section by discussing the impact of each personal experience on the whole crew.

**Proposed Approach**

The instructor should use the following leading questions to promote discussion among the participants. The expected replies listed should be used as a guide for the topics that should be discussed. If they are not raised, the instructor should either lead the discussion to them, or ask leading questions.

1. **Professional perspectives of survey life.** How would you characterize the field survey work compared to your usual duty in the office?

   - Long days and duty time;
   - High expectations from head office;
   - No day-to-day boss, need sense of responsibility to be efficient.

2. **Personal Perspectives.** How would you describe your field personal experience outside of work duties?

   - New environment, new food, new buildings, new schedule, new culture;
   - Far from family and friends;
   - Fatigue, excitement, isolation, boredom, etc.

   - After multiple survey assignments in various cultures, did you experience a pattern in your emotional phases during an assignment?

The instructor should aim to introduce the subject of ‘culture shock’ during this discussion, and wait for an appropriate time for it.

- Discuss other types of emotional stages (caused by separation with your family, isolation, etc)
Factors that have An Impact on Crew Cohesion and Resource Management (30 minutes)

**Instructors Notes**

This is the main section of the course. You want the audience to start thinking about all the factors that influence the crew cohesion and efficiency. We naturally expect the participants to easily talk about factors related to individuals and not so much about human factors and organizational factors. When their answers relate to human factors you can start asking specific question about leadership and personality types and expand in detail (see below). You can then discuss the organizational factors with the idea that we need to maintain a constructive discussion and we need to underline all the useful resources available to crew members at HQ.

**Proposed Approach**

The instruction should ask the leading question to the group: “What are the critical factors that influence the cohesion of a survey crew, and why does one survey crew work better than the an other?

The instructor should then write answers on the board. After 10 or 15 are articulated, the instructor should then introduce and discussion the following three general groups of factors:

- Individual experience, preparation and training;
- Human Factors;
- Organizational Factors.

After defining each group of factors, the instructor should ask the class to place their answers in the right class (place a P, H or O beside each factor).

The expected response should be as follows, and the suggested topics the instructor should lead the class to discuss are also as follows:

**Individual experience, preparation and training**

- Cultural awareness course;
- Professional and technical training;
- Previous survey/employment experience;
- Departmental training;
- SCRM training;
- Personal reading and preparation;
- Health and physical fitness.

**Human factors (What characteristics of human factors might affect survey operations)**

- Leadership
  - What is a good leader? What do you expect from a good leader? Enumerate the leadership competencies ([http://www.hrworld.com/features/top-10-leadership-qualities-031908](http://www.hrworld.com/features/top-10-leadership-qualities-031908))
  - Are there different leadership style? What leadership style is the best? Show the table with different ([http://en.wikipedia.org/wiki/Leadership](http://en.wikipedia.org/wiki/Leadership))
  - Is leadership reserved to the one in charge? Do you think everyone in a team can be a good leader? Talk about military organizations focusing on creation of leaders at the lowest level.

- Personality Types
  - Type of personalities. Are there personalities that are not compatible? If you’re aware of all personality types, could it be useful to develop skills in dealing with others? ([http://www.discprofile.com](http://www.discprofile.com))
• Physical issues
  • Ability to carry out physical work, ability to tolerate more extreme locations, latent injuries (i.e. back trouble) that might limit physical work.

• Gender differences

• Age differences
  • What impact will age differences have in the crew? A younger crew leader with an older AME for example.

• Cultural background issues
  • Does a wide variety of backgrounds help or hinder how the crew interacts? Upbringing, home country, religious background, etc.

• Fatigue elements
  • Work factors
    • Irregular schedules (variable time of day)
    • Long periods of duty
    • On-call nature of the work
    • Crew proficiency
    • Workload
  • Environmental factors
    • Weather conditions and temperature
    • Aircraft seating and equipment

• Lighting
• Noise level
• Time of day

• Personal factors
  • Biological rhythms
  • Quantity and quality of sleep
  • Physical fitness and health
  • Age
  • Family obligations
  • Diet
  • Psychological well-being

Organizational factors
• What is the role of each crew member in the whole team?
• What is the importance of your role for the success of the team?
• What is the role of the crew leader? Day to day boss or weekly/monthly operations planner and coordinator?
• How HQ can influence survey crew operations? Be ready to keep the discussion constructive and refocus on all available resources available at the HQ for field crew members.
Summary: Specific interactions between crew members during field operations (10 min)

Instructors Notes
This section concludes the first part of the training and represents an opened door to the upcoming scenarios. We want the participants to summarize all the general and abstract discussions that occurred and start to think how they relate to their day-to-day interactions with other crew members. List typical concrete interaction between crew members that could be improved by the proper application of the principles discussed in the training course. However, you might feel that this topic was largely covered during discussions and it isn’t appropriate anymore. This section could be used simply to summarize what was discussed and highlight important points.

Proposed Approach
Ask the participants to articulate what they have found important, or steer the discussion towards areas that you felt where not properly covered.

Scenario and Group Work (85 minutes)

Instructors Notes
This is the part of the training where you expect everyone to be involved actively. The instructor should make sure that the groups are weighted well, and to make a point of breaking up obvious cliques or groups with a narrow range of experience. The instructor should be prepared to ask leading questions to the presenter for the team, to draw out any learning outcomes that the presentation has not uncovered. The instructor should also actively circle and participate in the group discussions, and pay attention and guide groups who are straying.

Proposed Approach
During a ten minute break, the participants are formed into groups of 4 or 5, representing a typical survey crew as far as possible (pilots, AMEs, Geophysicists, and Technicians). Each group will be given a document with one of the five scenarios detailed below and specific questions to answer to each scenario. After 20-25 minutes of group work, the instructor should select a representative of each team that will be presenting for the team. By selecting the presenter at the end, you make sure that all team members will participate in the process. Each team will present, and all groups will be given the opportunity to respond.

The groups will be expected to analyse the scenarios in detail, and identify the various aspects of SCRM that can help or hinder the process from occurring. For example, for scenario four it would be expected
that issues of leadership and communications will be raised. For scenario three the instructor should direct the group (if necessary) toward discussing issues surrounding the individuals cultural experience in the country, and the impact that would have on their mental fatigue.

Six Scenarios

1. Drape preparation by office GEOs, revision of the drape report and drape verification by field GEOs and pilots at the beginning of a survey.

2. Flight following and importance of emergency rescue plan. Emphasis on the importance to review the procedure and the emergency rescue plan every time there is a new flight follower.

3. Pressure, fatigue versus professionalism. Discuss the continuous performance pressure as well as the mental and physical fatigue and confront these concepts to work ethics and professionalism.

4. Logistics, accommodation and general daily safety issues. This involves interactions between AME and GEO to find suitable working area and storage place near the aircraft. All the crew needs proper accommodations, food facilities, adequate transportation and safe drivers. How everyone can contribute a little bit to help the crew leader in his/her duty? How the crew leader can help himself by some task delegation?

5. Headquarter interaction with field crew. The goal is to underline the fact that each department at HQ is offering their support to the field crew.

6. Crews consisting of employees from various companies, i.e. leased aircraft operated by pilots employed by aircraft provider and equipment operated by crew leader employed by geophysical data provider. Discuss the difficulties that may arise between the individuals from different companies, due to differences in company policies, safety requirements, manuals, cultures and commercial interests.

Conclusions (5 min)

The instructor should reiterate the objectives of the course to the participants, then drawing in some of the topics that where raised, highlighting the importance of SCRM for survey crew operations.