The challenges of flight inspection and validation in remote and inhospitable locations

Author:

Richard Thompson
Executive Director
Radiola Limited

For more than 40 years Richard has operated in the Military and Civil Aviation sector. After a career in the Air Force as an Avionics engineer then Air Electronics Operator he moved to the civil world of flight inspection. With more than 25 years of Flight Inspecting in some of the harshest conditions around the globe, Richard has experienced first hand a wide range of expected and unexpected challenges while on international deployments (civil and military).

Abstract

Flight inspection remains an essential Air Traffic Management function. Some consider this to be a technical task while others consider it to be a Quality function. Reality dictates that it is a combination of both dependent on the level of local technical development.

Unlike larger developed countries where a relatively large number of navigation aids reside, small remote locations may lack a level of critical mass that justifies the establishment of a local flight inspection presence thus necessitating contracting services from external organizations.

Remote and inhospitable locations present unique challenges with respect to achieving flight inspection and validation tasks in a safe and cost-effective manner.

Safety management systems and Safety cases need unique application when operations deviate from what is normally encountered.

Introduction

The needs for flight inspection/validation do not change depending on isolation but the difficulty in providing this safety critical function does. Many flight inspection providers are structured technically and operationally depending on host country environment, regulations and requirements. These operations sometimes provide services to other countries but may not be the best solution for remote and inhospitable locations. Some remote locations may also have budget constraints that make purchasing of flight inspection services difficult. For these customers innovation may provide a means of continued compliance.

The military face considerable flight inspection challenges in times of conflict. Although some nations may authorize tactical flight inspection (essentially a fly ability check) it is more desirable to find a suitable means of flight inspection.

Volume versus distance

Aircraft operating costs remain the largest cost burden to the delivery of flight inspection and validation. Where a high density of navigation aids and procedures exist within one defined geographical location, the fixed costs of an operation can be distributed thus providing reasonable cost effectiveness. In the case of a remote location with a small number of navigation aids the fixed costs of deployment may be prohibitive. If this is the case it may be necessary to deviate from normal operational models. It should be noted however that deviations from standard operating procedures may have wide ranging impact on such things as:

1. Increased management overhead for evaluation and planning
2. Specific Risk assessment/Safety case
3. A safety management system that allows considered deviation from the norm

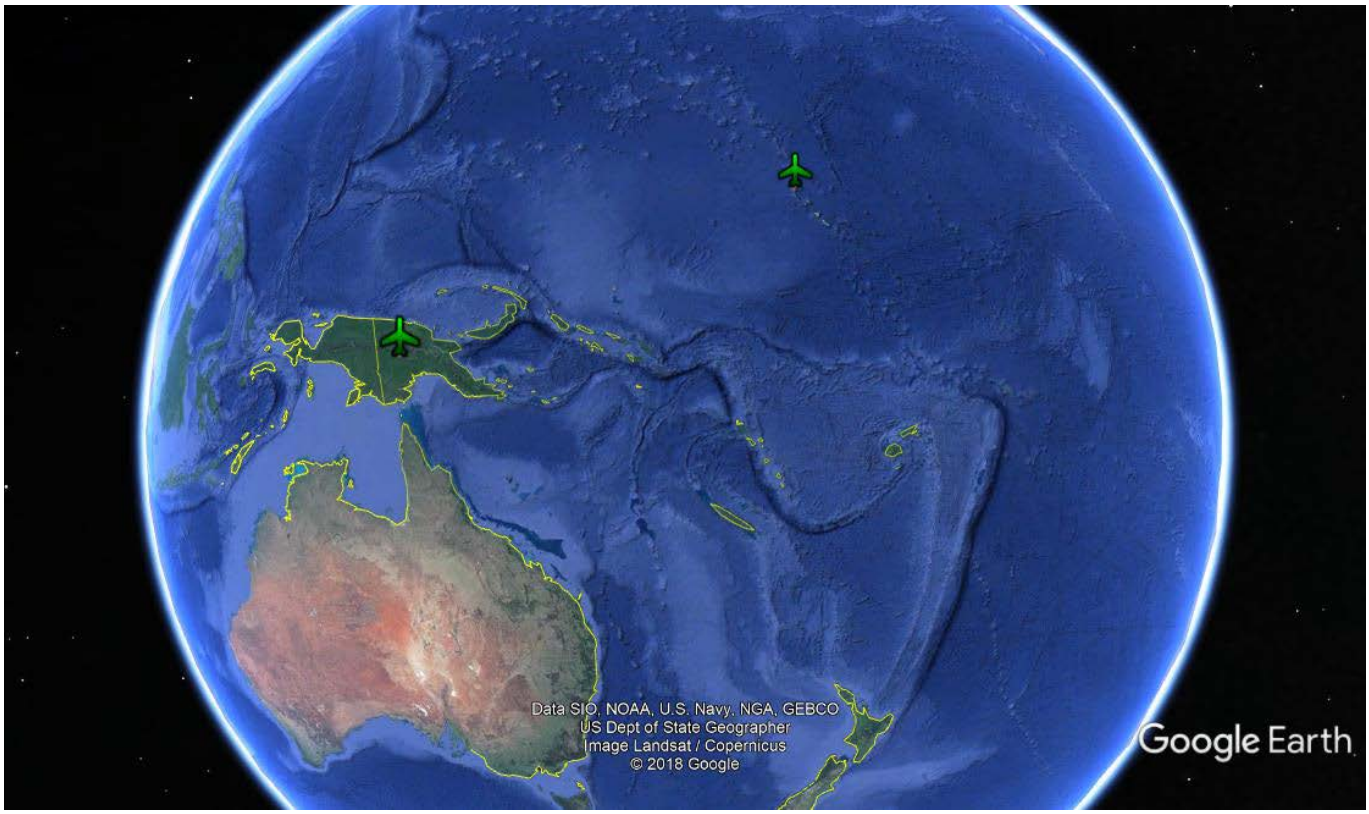
4. Case by Case health and safety policy
5. Crew selection
6. Flight and Duty times
7. Specific Recovery plan/Exit strategy

Regulatory compliance

Notwithstanding the above, compliance with the relevant regulatory requirements remain. A flexible approach to the delivery of the service may be required. What technical and operational solution is utilized will depend on the actual work content, where it is located and what conditions are expected.

Scope and Location of work

As previously mentioned the actual inspections to be conducted considering the location is key to the establishment of a solution. One extreme would be the navaid inspection requirement in a remote place such as Komo in the mountainous Southern Highlands of Papua New Guinea. Another example is a PAPI commissioning in Tarawa Kiribati. All locations have their unique issues to be dealt with.



The world is still a large place with many remote locations

Environmental factors may also need to be considered. These factors may affect aircraft, technical equipment and crew. One example is where the flight inspection aircraft was working at low altitude in hot humid jungle environment while overnight stops were at 11,000 feet.

Specific Considerations to Remote deployment

Risk assessment and Safety Management System

The companies Safety Management System must be structured in a way that allows detailed assessment of all risks. Risks will relate to commercial, equipment and personnel.

"Risk exists where assets, threats and vulnerabilities overlap. To effectively manage these risks, a cyclic process of identification, assessment, decision making, and calculated activity is essential"

Management overhead

Company management to the very top must recognize, embrace, engage and deliver a proactive safety policy. The evaluation and implementation of deployments to remote locations imposes significant management overhead. It is important to have adequate resources and skills to ensure evaluation, risk assessment and implementation can be achieved to a high level. External advice from competent organizations is required to give the best chance of success.

Health and Safety

Although technical equipment is important to protect, people are the most important. Deployment of crew to remote locations represents significant challenges. Crew need to have suitable skills and tools beyond standard qualifications.

New Zealand Legislation requires the following:

"The Health and Safety at Work Act 2015 requires directors to take ultimate responsibility for the health and safety of their business. Directors must have knowledge of and commitment to health and safety, but contrary to some beliefs, are not expected to be experts to meet the expectations of the Act. The principles underpinning health and safety governance are no different than any other aspect of a governance role. Good health and safety governance is about having a demonstrable plan and a pro-active approach to making the workplace as safe as it can be".

"Good practice in health and safety is good for your business – and it's the law. Managing health and safety can be a little daunting at first, but introducing practices that keep people safe doesn't have to be complicated and your business will not only be safer, it will be one that can develop and thrive well into the future."

There may be specific **medical** requirements that goes beyond inoculations. An example is high-altitude operations where crew may need specific medication and/or breathing oxygen. For one deployment the customer required a full medical including ECG, Lung Capacity, Full blood work, X-rays, dental checks and many more!

Specific **clothing** may be required. This could be extreme cold weather clothing, lightweight tropical, insect shield or even body armor. The specifics of the deployment need to be considered well in advance to ensure correct selection and distribution of clothing.

Stress needs to be considered. When outside a crew member's normal comfort zone different people will react in different ways. An open communications culture is needed to ensure feelings are expressed.

Once deployed systems and procedures need to be in place to resolve any unforeseen medical or security events.

The media

When assessing the viability of providing services in a remote location it is tempting to Google for answers. It should be noted however that news is often historical, in other words it has already happened. The news does not usually predict events which makes it important to utilize specialist sources for health, safety and security assessment.

Safety can be compromised in any location and in any country at any time but specific risk mitigating strategies must be considered for special deployments.

Crew composition

It is important to consider the specific people to be deployed. Leadership of the team is an important factor to consider ensuring operational, environmental, and cultural challenges can be managed. Specific personalities and gender may need to be considered depending on location. This not in any way discrimination just good sense. It may even be on a voluntary basis.

Empowering the crew

The deployed crew need to carry the authority that will enable major on-site decisions. It may not be possible to obtain high level guidance from home base due to the various location-based challenges. The crew must not feel pressured.

Communications

Communications in remote locations is often difficult and unreliable. Secondary means of communications may be necessary to ensure advice and assistance can be reliably supplied. There is also the need for crew to remain in contact with family. All families are different, some with more challenges than others. Allowing the crew to remain in contact without financial penalty can provide a level of comfort that reduces stress. A support network for family at home will help smooth challenges and problems.

Training

Preparing deployable staff to remote locations may require additional training from a specialist agency.

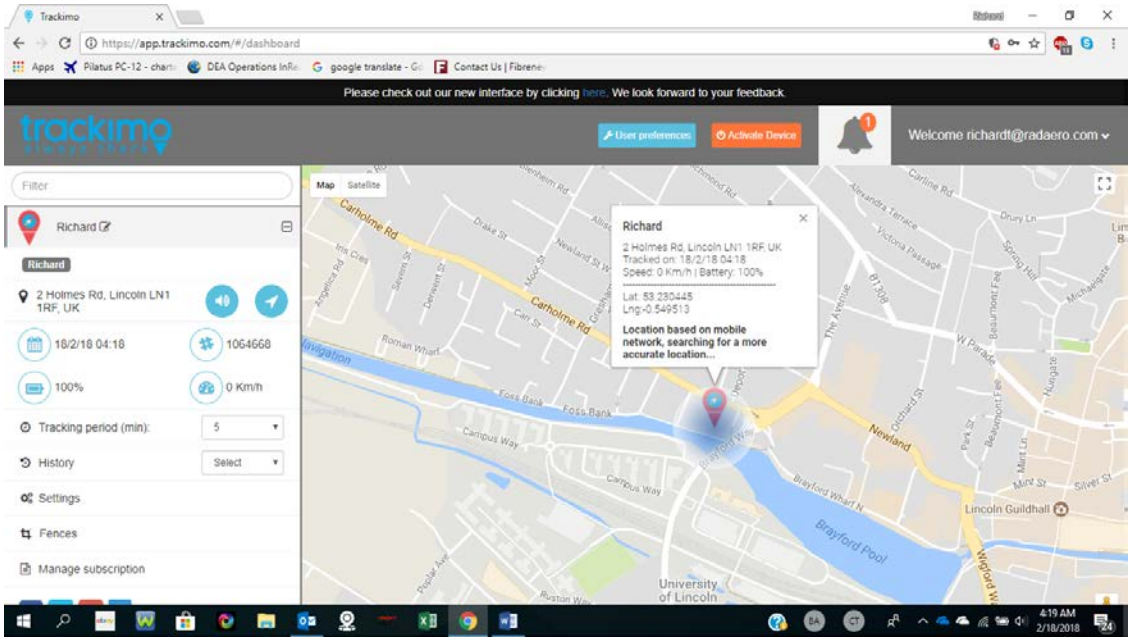
Training modules may include:

- Travel Risk awareness
    - General medical and security
- Women's Security
    - Mitigating the additional security risk for women
- Road Safety
    - Raising awareness of travel by road
- Health risks relevant to the location
    - Preventing and treating Malaria
    - Zika
    - Altitude sickness
    - Cold weather operations
    - Infectious diseases
- Advanced Security
    - Awareness and reaction to attacks
- Active Shooter
    - Identify and react to potential shooters
- Cyber security
    - Reduce the risk of data theft
- Kidnap
    - Prepare, react, cope and survive

Tracking

Although it is normal to track aircraft in real time it is not often that staff are individually tracked. It is highly likely that crew may be dispersed during non-flying activity. This may present risks to individuals. This could be anything from animal attack, crime, natural disaster or conflict. Personnel tracking and or Personnel locator beacons may be a sensible option. Personal beacons have proliferated in recent years and are not just used for mountaineers but for children and the old aged. A beacon is registered in the home country then if activated the alert goes to the home country then directed to the closest rescue coordination center. The Rescue Coordination Centre in New Zealand encourages New Zealanders travelling to remote world wide locations to carry a PLB.

Another option are items such as Trackimo. These are low cost GPS trackers which operate wherever there is a GSM cellular signal. Although not infallible they may be useful. As well as an SOS button the device can also be configured to transmit preset messages such as “ops normal”



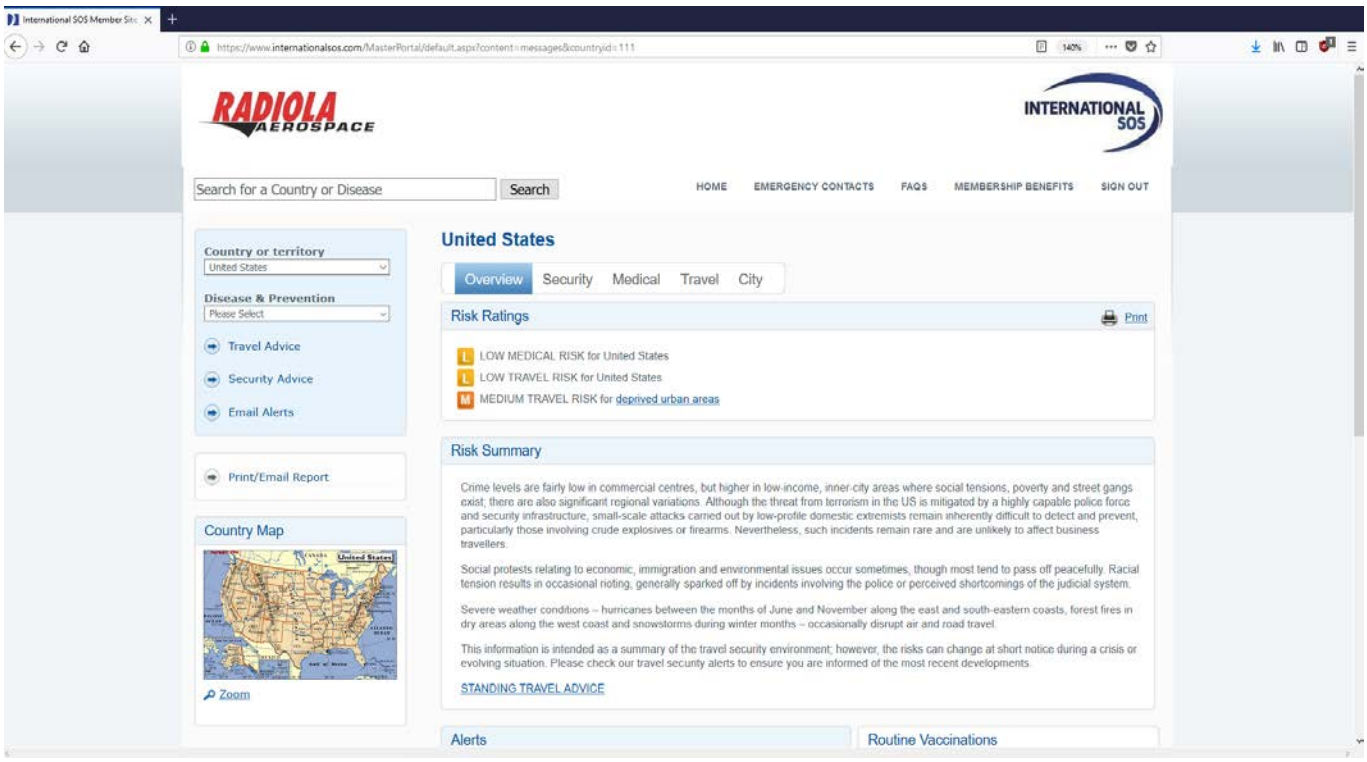
Flight and Duty times (FTL)

Standard company flight and duty times may need to be specifically considered. Matters such as Time zone changes during travel to site and living conditions may dictate a change to Flight and duty times. The actual operating environment may be more stressful and therefore more tiring. Crew fatigue has to be monitored especially if significant delays are experienced.

An Example: It was not possible to return to suitable accommodation without breaking FTL. A decision had to be made on site as to whether the crew stayed for one night in a 12 bed dorm with no air-conditioning or break FTL. Common sense prevailed with a subsequent report to CAA stating the reason why.

Obtaining Country briefs

When contemplating deployment to locations that require new or updated security assessment it is important to obtain complete and accurate information. There are several organizations that provide such support. It is important to note that the information must be "live" in that updates are continuous prior to and during a deployment.



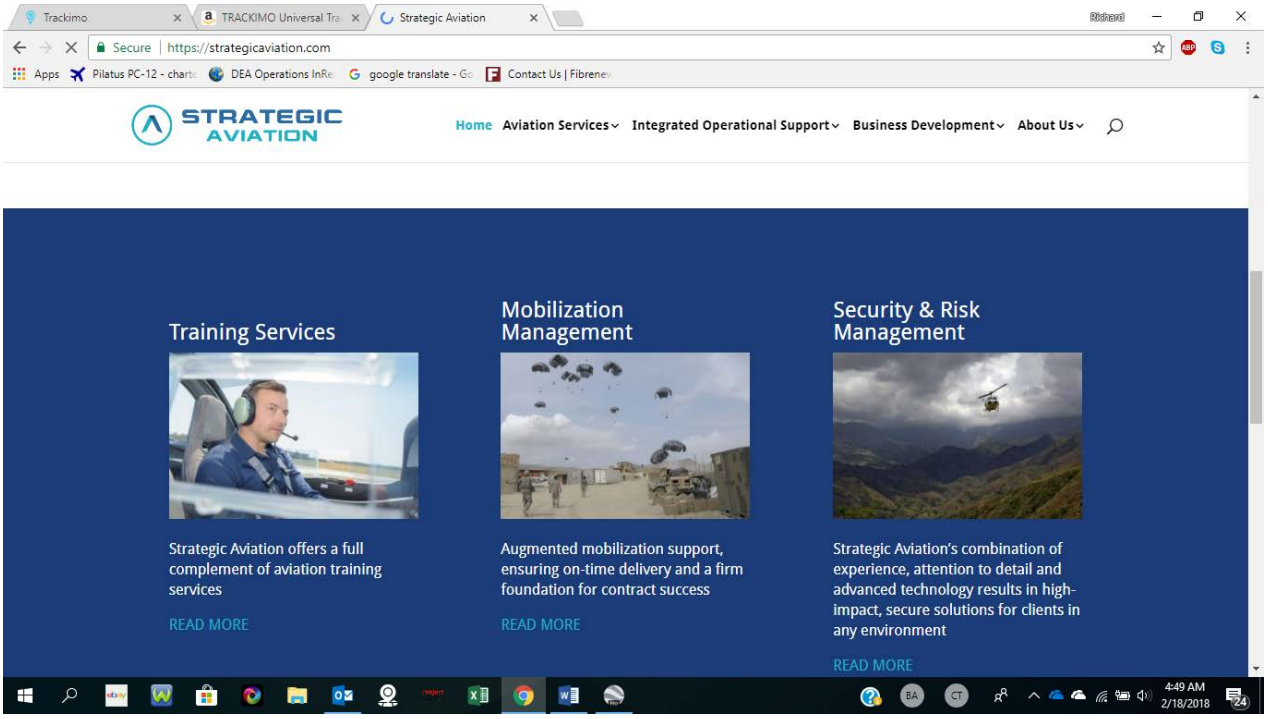
Example of safety and security information and advice that can be obtained

Radiola subscribes to International SOS who are the world's largest medical and travel security services organization.

Services provided by International SOS include:

- Pre-travel advice
- Live updates of situational changes
- Itinerary tracking
- Check in service
- Emergency contract numbers
- Emergency medical assistance
- A handy phone app
- Live tracking of personal

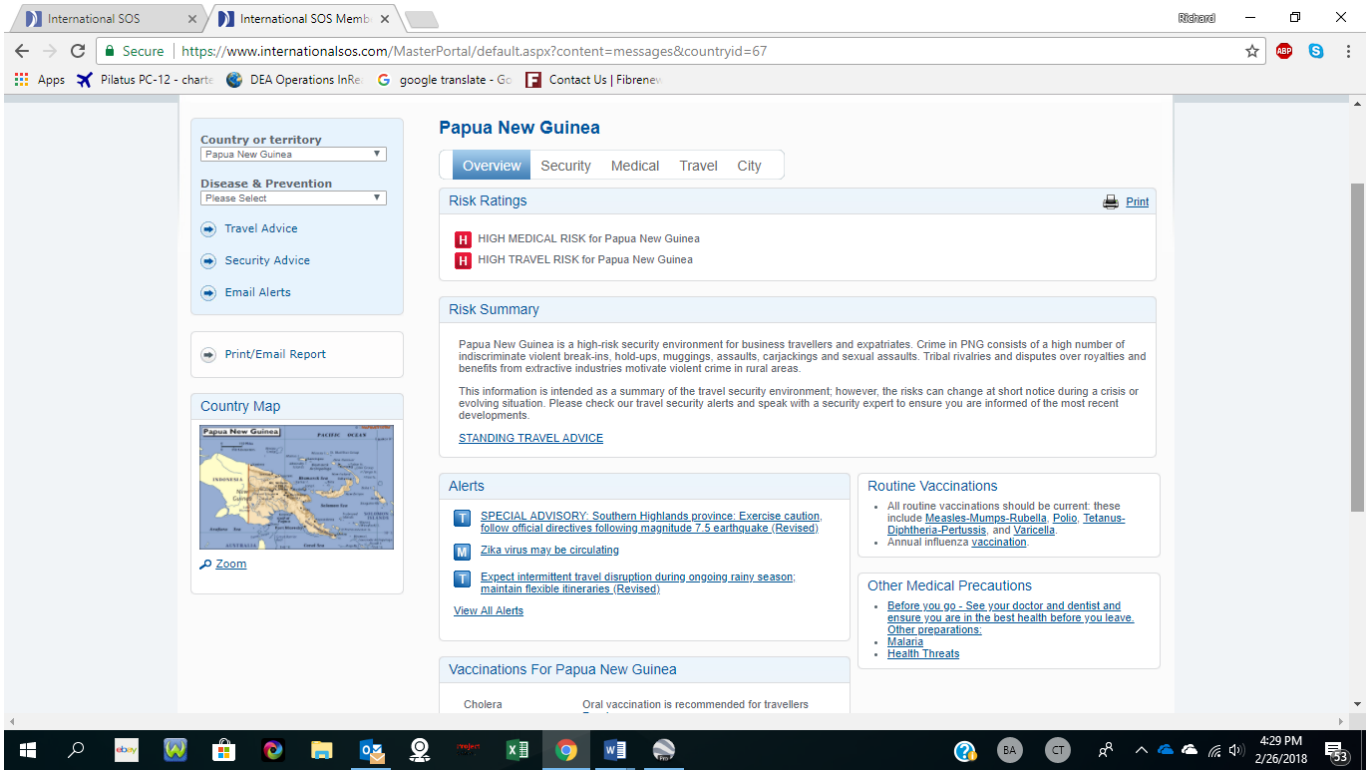
Strategic Aviation is another organization that has been used to provide timely and accurate intelligence on local security situations.



Strategic Aviation is another organization with access to detailed security information

Case Example

Papua New Guinea



Location Brief

Papua New Guinea presents considerable security and health challenges. A detailed Health and Safety policy is developed to provide guidelines for all matters relating to staff deployment to Papua New Guinea however the unexpected happened.

During February 2018 Radiola had two personnel deployed to a remote part of the highlands providing technical support and flight inspection at Komo airfield.

The two staff were fully prepared with measures in place to mitigate the various security and medical conditions which are found in the area.

However on 26 February 2018 at 0344 local a magnitude a 7.5 Earthquake struck at a depth of 30 Km. The epicenter was approximately 10 Nm from where the two deployed staff were accommodated. Damage to the life support infrastructure was immediate and severe. As part of a larger team of contractors, local disaster plans were quickly put in motion. When the violent shaking (strong enough to throw workers from their beds) subsided the fire alarms were activated and a large blaze noted close to the accommodation units. Evacuation from the buildings was rapid, the camp is a Gas Plant after all! It was during this rapid evacuation that our staff members were separated from their Sat Phone. The blaze was part of the local shutdown procedures to reduce gas pressure in the supply lines.

Our staff members made contact with head office watch keepers via text message at 0356 local, (0656 NZT) advising of the earthquake and confirming they were uninjured and safe. All communications were lost at 0410 local due to aftershocks and landslides causing additional local infrastructure damage.

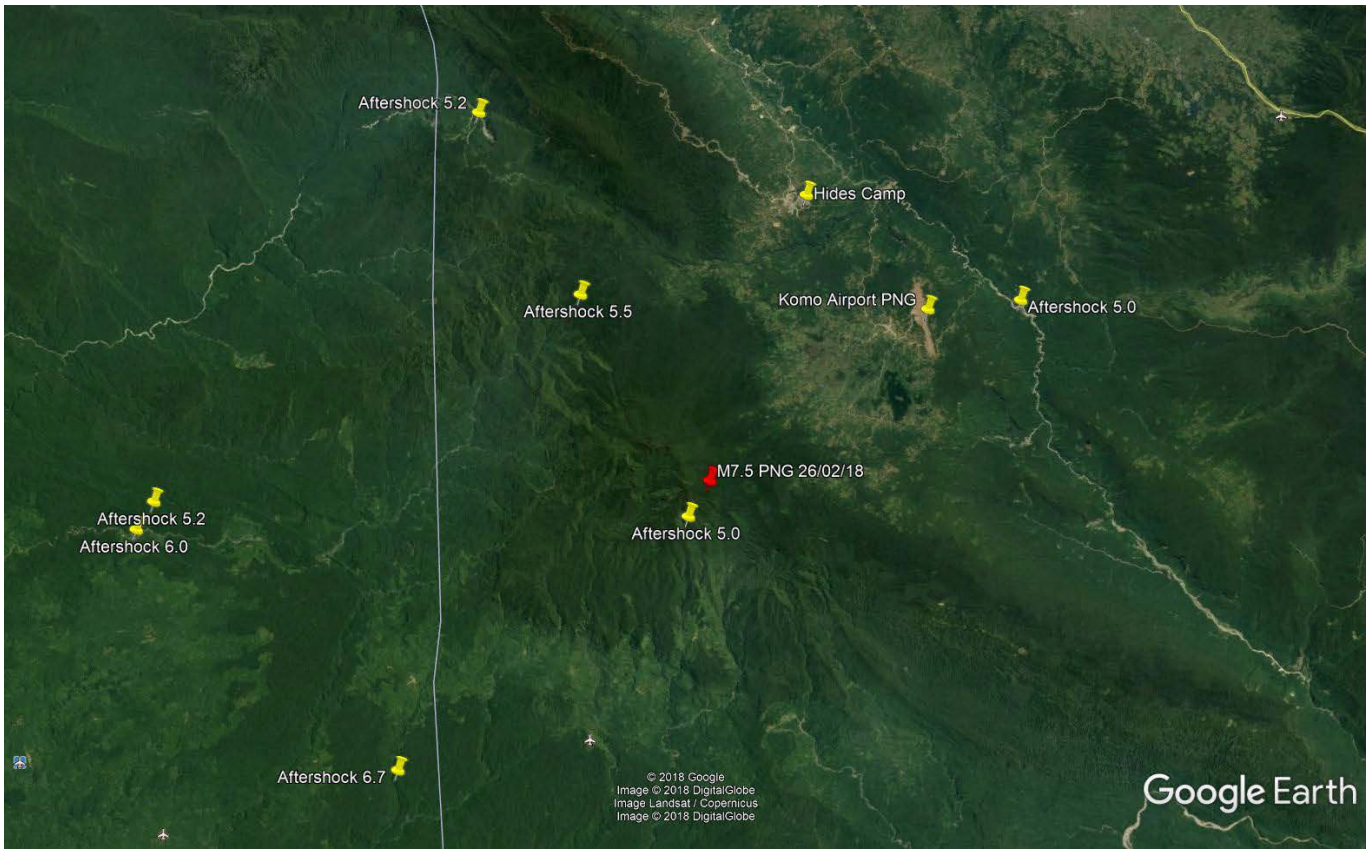
International SOS sent out their first email alert at 0730 NZT advising Management of the earthquake and to account for staff.

Affected families were briefed and close continuous contact with International SOS was obtained.

At 1830 NZT staff members regained their Sat Phone and communications with them was restored.

With poor road access at the best of times in the area, air transport is vital. Following the earthquake and subsequent aftershocks, the road to Komo airport was impassable and the runway itself was destroyed thus not allowing any fixed wing operations.

The evacuation of the entire camp required the shuttle of more than 400 staff from the site to a useable airfield 30 NM away. The three resident Bell 412 helicopters at the camp were rendered unserviceable by the earthquake. Due to the size of the chartered rescue helicopters, only a small number of passengers could be carried at any time. From there chartered Commercial Aircraft shuttled staff back to Port Moresby, and normal commercial airline for our staff back to New Zealand.



Earth Quake struck 10Km from accommodation site

The airport runway ***The Camp***

Conclusion

Deployment to remote austere locations should not be taken lightly. A company and its senior members have a moral and legal responsibility to ensure deployed crew are provided with the best possible preparation and support during and after deployments. Much of what has been said would seem to be common sense but the unexpected can and does happen.

To date the company has experienced:

- Several robberies
- One armed robbery (gun and knife)
- One large Earth Quake (7.5)
- One armed detention
- One sexual assault
- One indecent exposure
- Several physical injuries
- Several Vehicle accidents
- Numerous gastro events

Ref

New Zealand Health and Safety at Work Act 2015

Health and Safety Executive for United Kingdom

International SOS

Strategic Aviation