Session 7

Accident Site Hazards and Risk Management

SEMINAR ON AIRCRAFT ACCIDENT INCIDENT INVESTIGATION
11-15 AUGUST 2014
Topics

- Hazards at accident site
- Risk Management
Risk management

1. Identify hazards
2. Determine risk
3. Introduce controls
Hazards at Accident Site
Hazards at Aircraft Accident Site

- Collapsed power lines, buildings that have become structurally unsound, other flammable liquids, etc.
- Environmental and natural hazards
- Biological
- Dangerous Goods
- Wreckage
- Fire
- Psychological stress, etc.
Who is responsible for site safety?

- ARFF Personnel?
- Police?
- Investigator-in-charge?

Site safety coordinator is needed to brief personnel regarding hazards at the site.
Environmental and Natural Hazards

- Extreme weather condition, e.g. too cold or too hot
  - Cold climate:
    - Wear layered clothing that will absorb perspiration
    - Be aware of white-out conditions – disorientation can occur in white and bright surrounding
  - Hot climate:
    - Drink enough to avoid dehydration (at least 0.5 liter/hr in extreme condition)

- Mountainous terrain
  - Altitude sickness – dizziness, headaches, loss of energy, difficulty sleeping
  - Limit physical exertion
Biological Hazards

- **Bloodborne pathogens (BBP)**
  - Disease producing organism carried in the blood, e.g.:
    - HIV – Human Immunodeficiency Virus
    - Hepatitis – Inflammation of the liver

- **Other infectious body fluid:**
  - Cerebrospinal fluid (from brain and spinal cord)
  - Synovial fluid
  - Pleural fluid
  - Saliva
BBP Modes of Transmission

- Blood and body fluids transmitted through
  - Mucous membranes
  - Non-intact skin
  - Cuts (rashes, psoriasis)

- Exposure to BBP on the job is very likely if unprotected
Protection Against BBP

- Vaccination
  - Not possible for all the BBP (e.g. HIV)
  - Hepatitis B vaccination – a series of injections over six months period
    - Provides protection for at least 7 years, some even for life

- Exposure control plan
  - Engineer controls
  - Work practice controls
  - Personal protective equipment (PPE)
Controls

- **Engineer controls**
  - Controls that isolate or remove BBP hazard from the workplace (often not possible at accident site)

- **Work practice controls**
  - Reduce the likelihood of exposure by changing the manner in which a task is performed e.g. wearing PPE
Personal Protection Equipment (PPE)

- Special clothing or equipment that is worn for protection against a hazard
- Selection of appropriate PPE is a challenge
- PPE should be made available to investigators in appropriate sizes
- Training required for the proper use and disposal
PPE Kit

- PPE kit containing personal protective equipment should be made available to each investigator.
- The kit should include:
  - A full-cover protective suit, several pairs of latex gloves,
  - Work gloves, face masks, goggles, shoe covers and protective
  - Boots, disinfection chemicals and a biological hazard
  - Disposal bag
PPE Precautions (1)

- Remove jewellery that may snag on things
- Use glasses rather than contact lens
- Check clothing worn correctly
  - Better to have an assistance when wearing PPE
- Check clothing frequently for damage
- Site entry checks
- Set up entry/exit controls
- Set up decontamination area
- PPE can be a hazard under conditions such as hot and humid weather – drink lots of water before entering site and take regular breaks to avoid heat stroke
PPE Precautions (cont’d)

On-site hygiene

- No eating, drinking or smoking on site
- Suitable breaks for rest
- Avoid touching mucous membrane
- Re-assess risks/PPE frequently
- Procedures for cleaning and decontaminating equipment and materials
- Procedures for containing and disposal of contaminated waste
Duties at Crash Site

- Investigator-in-charge
  - Identify a safety officer
  - Initial evaluation of site and identify biohazard areas
  - Establish the site size and level of protections and precautions
  - Set-up site access control
  - Ensure all participants are trained in BBP
  - Coordinate contaminated waste disposal
  - Daily review of site and conduct briefing to all participants on precautions at the site
Duties at Crash Site (cont’d)

- Group leader
  - Coordinate with IIC on site safety procedure
  - Monitor the use of PPE and de-contamination practices
  - Ensure group members follow strictly to the procedures set for contaminated site
Dangerous Goods Hazards

- Verify cargo manifest and consult operator of any DG carried onboard
- DG include: radioactive consignments, explosives, ammunition, corrosive liquids, liquid or solid poisons or bacterial cultures
- Post crash impact or fire may comprise DG packings
- When in doubt, consult qualified DG specialist
Wreckage Hazards

- Unsound aircraft / engine structures, sharp edges of aircraft wreck
- Pressure containers such as oxygen bottle, accumulator, life-raft inflation bottle, etc.
- Other hazards include tires, battery, fuel
- Composite materials – carbon/graphite, boron/tungsten and fiber glass– hazardous to skin, eyes and respiratory system
- Spray water or fifty-fifty solution of acrylic floor wax and water on burnt composite / fiberglass before handling
Psychological stress

- Psychological hazards:
  - Traumatic stress, fatigue, burnt out, illness, guilt and isolation posed great challenge to investigators

- Symptoms of post-trauma stress include re-experience, avoidance, hyper-arousal, dissociation, anxiety, depression, alcoholism, phobias, etc.
Mitigating psychological stress

- Organise meeting with team members at least once a day
- Schedule regular breaks when the field phase is prolonged and schedule regular debriefs
- Look out for team members who symptoms of stress, e.g. mood swing, not eating
- Best way to mitigate stress is to talk to friends and family members
Risk Management
Risk Management

- When does a hazard become a risk?
  - Risk is generated once we determine that exposure is planned or is likely, or on occasions, has already occurred

- In order to manage risk, we need to:
  - Understand the nature of hazards
  - Severity and likelihood of exposure
  - Exposure – duration and concentration
  - Frequency of exposure
  - Persons likely to be exposed
Risk Assessment

- Identify likely hazard and risk based upon:
  - Experience
  - Information systems, data
  - Training
  - Guidance material

- Some useful information can be obtained before arriving at site through:
  - Initial notification data
  - Operators information
  - Cargo manifest
  - Geographical location
  - Media reports
Risk Assessment (cont’d)

More accurate risk assessment can be obtained from:
- Emergency responders (firemen/police, etc.)
- Team members at site through survey and on-site inspection
Risk Components

Severity \times Likelihood

RISK
## Risk Assessment Table

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<th>Moderate</th>
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</table>

- **20 – 25 Very High Risk**
- **10 – 16 High Risk**
- **5 – 9 Medium Risk**
- **3 – 4 Low Risk**
- **1 – 2 Very Low Risk**
Control Measures

- Good control measures can be put in place to reduce the risk of exposure, such as:
  - Proper planning
    - Identify the likely activities at site
    - Sufficiently address all foreseeable risks
  - Robust procedure
    - Elimination of risk (if possible)
    - reducing exposure to hazard by safe procedure or instructions with documentation
  - Good training
  - Necessary protective equipment
- End -

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