Canada-Newfoundland and Labrador Offshore Petroleum Board

C-NLOPB

Safety Forum

29 & 30 October 2013
“Risk! …

… managing and mitigating starts with awareness and understanding”

“Managing Risk is part of good Leadership”

“Dealing with Risk is a Team Sport”
Some Background

- **Why Me? … talking about risk?**
  - Mistakes and lessons of others, my own experiences

- **Background**
  - Land Surveyor / Civil Engineering / Commercial Diver
  - Flight Instructor, Fighter Pilot, Forward Air Controller

- **Leadership & Command Experiences**
  - Tactical Air Control Party
  - Squadron / Wing / Base

- **Director of Air Force Mission and Combat Readiness**
  - Airworthiness Advisor – Risk Assessment & Decision Briefs

- **Director of Operations**
  - 9/11, G8 Kananaskis, Homeland Defence

- **Afghanistan – Air Commander and Deputy Chief Joint Operations**

- **NAV Canada – Chief Operational Safety Oversight**
Leadership Formula

\[ E = mc^2 \]

Albert Einstein 1905

\[ \frac{P_1}{W} + Z_1 + \frac{V_1^2}{2g} + H_0 = \frac{P_2}{W} + Z_2 + \frac{V_2^2}{2g} + H_f \]
Elements of Leadership

- Skills
- Qualities
- Style
- Approach
- Commitment
- Sacrifice
Leadership Formula

Skills + Qualities^2 +

(Approach \times Style)^5 +

(Commitment \times Sacrifice)^{10} =

Leadership Potential

“Tony Hayward”
Leadership Within The Team

Executive

Management

Supervisors

Supervisors

Frontline

Frontline

Frontline

Frontline
Leadership Within The Team

- Executive
- Management
- Supervisors
- Frontline
- Frontline
- Frontline
Leadership Imperative

Skills
Qualities
Style
Approach
Sacrifice
Commitment

The Leader

Team
Relationships
Ability to Connect
Understanding
Empathy
Cohesion
Esprit de Corps
Leadership Imperative

Skills
Qualities
Style
Approach
Sacrifice
Commitment

The Leader

Mission
- Change Direction
- Press ahead
- Pause
- Fall Back
- Abort

Team
- Relationships
- Ability to Connect
- Understanding
- Empathy
- Cohesion
- Esprit de Corps
Responding to Change

- Protecting Vital Points
- National Command Authority
- Concept of Operations
- Call from Washington
- New Approach ...
- ... The rest is History!
Submarine Duty
CF18 Squadron Technicians

- Pilot-Tech Relationship
- First Name Basis
- General John de Chastelain
- Army, Navy, Air Force
- Brown Envelopes
- Pilot Get Well Programme
- Operational Fighter Missions
- Role of the Technicians
- Pre-mission Briefs
- A Special Bond
- Engagement → The Team
**Team Members – Who Are They?**

- **Executives**
- **Managers**
- **Supervisors**
- **Specialists / Operators**
Horizons and Milestones

- Years / Decades
- Weeks / Months
- Days / Weeks
- Hours
Team Focus & Responsibilities

- Vision and Change
- Manage Resources / Tasks
- Task Supervision
- Frontline Task Execution
How the Team Really Works

Executive Officers

Management

Supervision

Frontline
How the Team Really Works

Frontline

Commander

Staff

Commander

Staff

Commander

Staff

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Commander

Staff
Mission Command

• **Successful Command ➔**
  – Based on “Effective Leadership”
    • Skills, Qualities, Approach
    • Commitment and Sacrifice
    • Connecting with the team, Relationships

• **Effective Commander ➔**
  – The Mission
  – The Team
  – Doing What’s Right, Always ! Courage !
  – Informed Decision-Making
  – “Risk” – awareness and understanding
  – Achieving the Mission While Protecting The Team
Leadership Within The Team

- Mission Commander
- Staff
- Sub-Commander
- Frontline
- Frontline
- Frontline
- Frontline
Commander’s Focus

Achieving the Mission
While Protecting The Team

Likelihood of Mission Failure
Likelihood of Loosing the Team
Consequences of Either

What are the Risks?
The Team’s Focus

Achieving the Mission
While Protecting The Team

Likelihood of Mission Failure
Likelihood of Loosing the Team
Consequences of Either

What are the Risks?
What are the Risks?
Thinking About Risk
Thinking About Risk

- We do it everyday
- Home
- Work
- Sports
- Hobbies
- Our Families
- Our Kids
- Teenagers!!!
Characterizing Risk

Public Transit
- Winter Operations
- Tires and Equipment
- Training and Experience
- Best Practices and Lessons
- Discipline
- Policy and Procedures
- Safety Record
- Situational Awareness
- Informed Decision-making
Characterizing Risk

Likelihood
- Assessment Factors
- Event, inherent challenges
- Team competency
- Equipment / Enablers
- Environment / threats
- Unit safety culture
- Appropriate Actions
- Situational Awareness
- ROE, procedures

Consequences
- Legal Liabilities
- Law Suits
- Laws and Regulations
- Accountable Executives
- Accountable Managers
- Public Trust & Confidence
- Team-Pride / Ownership
- Professional Team-Esteem
- Quality of Profession

Likelihood of Negative Outcome

Consequences of Negative Outcome
Characterizing Risk

Severity

Repeatability
Ask Any CEO about Enterprise Risk Management

The CEO
The Mission
The Team

Introducing New Technology
Escalating Operating Costs
Personnel Reductions
Pensions

Falling Revenues
Retirement Attrition Recruitment
Hazardous Events
Union Demands

The CEO
The Mission
The Team
Characterizing Risk

- Executives
- Managers
- Supervisors
- Specialists & Operators

Severity

Repeatability
Likelihood & Consequences of Negative outcome

Assessment Factors

- Environment & Weather
- Security & Opposing Forces
- Mission Type
- Effects Enablers
- Unit Experience
- Other Factors?
- Unit Competency
- Leadership Management Supervision
- Unit Safety Record
Event Analysis – Risk Assessment – Who’s Involved?

- Operations
- Maintenance
- Engineering
- Human Resources
- Safety
- Standards & Evaluation
- Capability
- Resource Managers
- Other
Sea King – Fuel Flow Divider

- Critical Engine Defect
- Fuel Sprayed into engine compartment
- Crew burned to death

Engineering Risk Assessment

- Low-Medium with mitigations
- Return to normal Operations

Operations Risk Assessment

- High to Extreme
- Fleet grounded UFN
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Getting Everyone on the Same Page
Capability Communities and Fleets
Afghanistan

November 2008 to November 2009

– Theatre Air Commander (NATO ACC)
  • Air Bases
  • Air Assets and Units

– Director Air Component Element (DIR ACE)
  • Air Operations Planning
  • Air-Land Integration

– Deputy Chief Joint Operations
  • Land Forces (Army Operations)
  • Special Forces (Counter Terrorism)
  • Counter Narcotics
  • Dynamic Targeting
  • Strike Approval Authority (SAA)
## Troop Contributing Nations

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Afghanistan

**ISAF Coalition**
- 42 nations
- NATO procedures and methodologies – imperative!
- One common approach / framework to risk
- Accountable Executive – in perpetuity → LOAC

**Informed Decision-Making**
- Risk-based decision briefs

**During a busy week**
- Brigade-Level Operations → 2 - 3 per month  Multiple briefs
- Battalion-Level Operations → 2 - 3 per week  Two-hour briefs
- Special Forces Missions → 3 - 5 per night  20 min briefs
- Dynamic Targeting → 2 - 3 per week  20 min briefs
- Counter Narcotics → 2 - 3 per week  One-hour Briefs

**Strike Approval Authority**
Special Forces and Dynamic Targeting

• Taliban Leadership
• The Worst of the Worst
• Global Intelligence
• Eliminate from Battle Field
• Due Process, Rigour
• LOAC → Accountability
• Back home
Special Forces and Dynamic Targeting

- “Typical Day” in SoF?

- 3-5 missions / night
  - Decision Briefs - Risk
  - Objective, RA / RM
  - Resources
  - Strip Criteria
  - ROE

- Critical Resources
  - Lift
  - EA, Armed Overwatch
  - ISR, Strike

- Specific Missions
  - Motorbike, Tractor hi-jack
  - Kids in Compound, Vehicle, abort
  - Replay, reviews
  - SF hit, kids in the car
  - Successful Strike, voice week later
  - Post-msn, back to my trailer
Counter Narcotics

- Opium Labs
- Hundreds Active
- Thousands employed
- Logistics and Support
- Culture \rightarrow Likelihood
- Stock Piles and Storage
- Drug Lords, Criminals \rightarrow Taliban
- "Cooking" Labs
- Eradication \rightarrow Alternative Livelihoods
## Special Forces Mission

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# Special Forces Mission

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<tr>
<td>SA - ISR</td>
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<td>Leadership</td>
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<td>Unit Competency</td>
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<td>Equipment</td>
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<tr>
<td>Effects &amp; Enablers</td>
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<td>ROE &amp; Procedures</td>
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Characterizing Risk

Severity

Negative Outcome

Consequences

Repeatability
Canada’s Air Navigation Service Provider

- **Hazardous Events** → Defined by Transport Canada
- **NAV Canada Hazardous Events** → 350 to 400 per year

**Company’s Main Focus** →
- Prevent Aircraft from Hitting Each Other
- “Losses of Separation” → 70 per year
- When Aircraft get too close …
- … severity classification with respect to proximity
- Proximity is used to define “**severity / risk**”
- Classification Framework → A1, A2C, A2M, A2T, A3
- A3, No Loss of Separation
- But what about the other events?
  - Unprotected IFR Profiles, Runway Violations
  - Min Safe Altitude, special use airspace violation, etc
### Characterising Risk – Unprotected IFR Profile

<table>
<thead>
<tr>
<th>Proximity</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No Loss</td>
<td></td>
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</tbody>
</table>

- **Proximity** indicates the degree of risk associated with an unprotected IFR profile.
- **No Loss** signifies a low level of risk, likely due to adequate safety measures or operational protocols.
- The table uses a color gradient to visually represent the severity of risk levels from NA (Not Applicable) to Extreme.
### Characterising Risk – Unprotected IFR Profile

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<thead>
<tr>
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<td><strong>Fit For Duty Experience</strong></td>
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- **No Loss**
# Characterising Risk – Unprotected IFR Profile

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<td>X</td>
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<tr>
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Event Analysis Risk Assessment Factors

### Assessment Factors

1. **Situational Awareness**
2. **Actions: Plan – Execute – Monitor**
3. **Proximity**
4. **Flight Path & Altitude Convergence**
5. **Weather → VMC, IMC, Night, Extreme Weather**
6. **Work Load and Complexity**
7. **Fit For Duty, Qualifications, Experience**
8. **Training, Staffing and Supervision**
9. **Equipment / Facilities / Software / Engineering**
10. **Procedures – IFR, VFR, Controlled, Procedural**
11. **Others … Safety Record, Leadership, Engagement, Safety Survey**

---

**A1** →
- **Vertical**: < 250 ft
- **Lateral**: < 500 ft

**A2C** →
- **Vertical**: > 250 ft, < 500 ft
- **Lateral**: < 50%

Significant risk exists due to:
- Wake Turbulence (LoS)
- Collision with other aircraft
- Collision with Terrain / Obstacles

**A2M** →
- **Vertical**: < 50%
- **Lateral**: < 50%
- **Excluding**: A1 & A2C

No significant risk exists due to:
- Wake Turbulence (LoS)
- Collision with other aircraft
- Collision with Terrain / Obstacles

**A2T** →
- **Vertical**: 50% or greater
- **Lateral**: 50% or greater

**A3** →
- Breakdown in
  - Plan
  - Execute
  - Monitor

And where safety was not assured
<table>
<thead>
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<th>Category</th>
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<th>Moderate</th>
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<td>Develop a viable plan, Execute in timely manner, Monitor, adjust</td>
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<td>Separation, &gt; 50%</td>
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<td>Visibility unobscured Clear day VMC</td>
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<td>Not a factor</td>
<td>Training not taking place Staffing Supervision</td>
<td>Pilot training, controller training, instructor staff / supervision</td>
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<td><strong>ATS Equipment / Facilities</strong></td>
<td>Not a factor</td>
<td>No major outages, ATS capabilities serviceable Optimum Comms</td>
<td>Minor loss of ATS capabilities, Degraded Comms</td>
<td>Loss of ATS capabilities, affecting normal operations, Comms unreliable</td>
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<td>Partial loss of control, Non-adherence to procedures</td>
</tr>
</tbody>
</table>


**Risk Levels:**
- Low
- Moderate
- High
- Extreme

**Not a Factor**
- Optimum pairing / staffing, Experienced, competent,

**Compilation:**
- Situational Awareness
- Response / Action
- Proximity
- Flight Path, Profile View, Altitude
- Meteorology / Environmental
- Work Load / Complexity
- Fit For Duty, Qualification, Experience
- Training, Staffing and Supervision
- ATS Equipment / Facilities
- Procedures

**Complete Description:**
- Situational Awareness
  - Activity in Area of Responsibility
  - Recognition that safety not assured
  - Need for Action / Conflict Resolution
- Response / Action
  - Plan: addressing hazardous situation
  - Execute: timeliness, effectiveness, assertiveness
  - Monitor: progress, success, alternate action
- Proximity
  - 10%, 25%, 50%, 100%
  - Risk increases as distance decreases
  - Time available to react
- Flight Path, Profile View, Altitude
  - Opposing
  - Converging
  - Diverging
- Meteorology / Environmental
  - VMC vs IMC - Visual / Reduced Vis
  - Day / Night
  - Adverse Weather
- Work Load / Complexity
  - Type of Airspace
  - Volume of Traffic
  - Diverse Operations - VFR, CVFR, IFR
- Fit For Duty, Qualification, Experience
  - Fit for Duty - Mental / Physical / Fatigue
  - Qualified and competent
  - Experience appropriate for duty assignment
- Training, Staffing and Supervision
  - Training Environments - higher risk
  - Staffing level, Crew Pairing, left-seat, right-seat
  - Supervision
- ATS Equipment / Facilities
  - NARDS, EXCDS, Radar, M-Lat
  - TCAS, Transponder, ADS-B
  - Comms
- Procedures
  - Controlled / Uncontrolled
  - Compliance / Adherence to procedures
  - Application - effective / timely

**Risk Levels:**
- Low
- Moderate
- High
- Extreme

**Risk Assessment Guide:**
- Unaware of hazardous situation
- No plan, No action No monitoring / Exacerbated Hazardous Event
- Separation < 10%
  - 100' Verticle // 500' Lateral
- Evasive action to avoid collision (TCAS, Visual) Closure >700 kts
- Solid IMC Conditions, No visual with nearby AC, Adverse Weather
- Maximum Capacity, Diverse / complex operations, Mixed VFR / IFR, reduced Vis
- Critical staff absent, Inadequate experience No supervision
- Solo student pilot, controller training, inadequate supervision
- Major loss of critical ATS capability, normal operations not possible, Loss of Comms
- Loss of control, radar / procedural, procedural violations
Event Analysis Risk Assessment

Automated, electronic access to all data sources by all process stakeholders

**Event Reporting**
- ANS, Aircrew, TC, TSB
- AORs & ATS-OIs
- Related Reports

**HR Data**
- Fit for duty, Fatigue, Medical
- Employment History, Training
- Engagement Survey

**Unit Information**
- Files, Tapes, Radar, Audio
- Pre-Lim Reports, Interviews
- Safety Record, Safety Survey

**Site Information**
- Local / Regional Weather
- Airfield Information / Status

---

**Tech Ops & Engineering**
- Significant Outages
- System status, reliability
- ANS Systems, Status, Reliability

**AIS & FIO Data**
- NAV AIDS
- Approaches

**OSI Reports**
- Chronology of Events
- Facts, PETE, Barriers

**Regulations & Procedures**
- MANOPS
- Local Procedures & Agreements

---

**Understanding the Event**
- Establish “What” Happened
- Identify the “Error”
- “Human Performance” → HF’s
- “Why” the Error occurred
- Cause Factor (s)
- Contributory Factor (s)

---

**Event of Interest**
- Date, Time, Location
- Involved Unit (s)
- Event Type
- AOR Number

---

**Risk Assessments**
- Assessment Factors x 10
- Overall Severity / Risk
- Systemic / Organizational Concerns
- Hazards / Deficiencies
- Human Performance / Factors
## Risk Assessment Framework - Word Picture Guide

<table>
<thead>
<tr>
<th>Parameter</th>
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</table>
The Absence of Accidents does not imply the Presence of Safety
Military Command

• **Successful Command**
  – Based on “Effective Leadership”
    • Skills, Qualities, Approach
    • Commitment and Sacrifice
    • Connecting with the team, Relationships

• **Effective Leadership**
  – The Mission
  – The Team
  – Doing What’s Right, Always ! Courage !
  – Informed Decision-Making
  – “Risk” – awareness and understanding
  – Achieving the Mission While Protecting The Team