International Survey on Human Factors in Maintenance Organizations

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Little Rock, AK
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Agenda

Respondent Demographics

Why have an Human Factors Program

Regulator Support & MEDA

Training Program

Recommendations

Status of 2007 ASI Survey
Survey Goals and Methods

- **Purpose**: Assess international status of maintenance HF
- **Look at**: HF programs, fatigue management, error management, and training.
- **Comparison**: Compare by regulators, Does it make a difference if there is a rule?
- **Distribution**: Online survey (80 items) to 630 addresses.

Summary Findings

- Transport Canada and EASA countries have the most robust programs.
- Strong regulations promote strong HF programs.
- Fatigue issues are perceived to be important but little action.
- When companies have programs they are similar.
- Companies record event data but do not use it enough.
54 Countries
414 Total Respondents (66% response rate)
200 Organizations (Estimated based on 66%)
Experience: 65% > 20 yrs. maintenance experience

Responding Countries

Argentina 4  Greece 10  Peru 1
Australia 19  Greenland 1  Philippines 4
Austria 1     Guatemala 2  Poland 1
Bahrain 1     Hong Kong 6  Portugal 2
Belgium 3     Hungary 1    Romania 1
Bolivia 3     Ireland 2    Singapore 12
Brazil 3      Italy 1      Slovenia 1
Canada 36     Japan 3      South Africa 5
Chile 3       Korea 2      Spain 8
China 3       Kuwait 1     Sweden 4
Columbia 3    Luxembourg 1 Switzerland 4
Cyprus 1      Malaysia 6   Taiwan 9
Denmark 1     Malta 1      Thailand 1
Ecuador 1     Mexico 4     Turkey 1
El Salvador 1 Netherlands 2 United Arab Emirates 3
Finland 1     New Zealand 3 United Kingdom 29
France 3      Norway 12     United States 160
Germany 6     Panama 4     Venezuela 3
### Who is your Regulator? (N=404)

<table>
<thead>
<tr>
<th>Regulator</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Aviation Administration (FAA) N=182</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>European Aviation Safety Agency (EASA) N=95</td>
<td>23.5%</td>
<td></td>
</tr>
<tr>
<td>Civil Aviation Safety Authority (CASA) N=19 Other</td>
<td>17.8%</td>
<td></td>
</tr>
<tr>
<td>Transport Canada N=36</td>
<td>8.9%</td>
<td></td>
</tr>
<tr>
<td>Civil National Aviation Authority N=72</td>
<td>4.7%</td>
<td></td>
</tr>
</tbody>
</table>

### What type of Maintenance Organization?

- Airline Maint. 35.0%
- Repair Stn 27.3%
- Mil/Gov’t 8.2%
- GA/Biz 8.6%
- Manu 4.8%
- School/Trng 5.6%
- Other 10.1%
### Respondent Job/Role/Responsibility

<table>
<thead>
<tr>
<th>Job Role Title</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor/Manager/Coordinator</td>
<td>37.1</td>
</tr>
<tr>
<td>Quality Assurance/Quality Control/Airworthiness</td>
<td>28.4</td>
</tr>
<tr>
<td>Training</td>
<td>11.9</td>
</tr>
<tr>
<td>Engineering</td>
<td>6.2</td>
</tr>
<tr>
<td>Technician/Mechanic</td>
<td>4.4</td>
</tr>
<tr>
<td>Consultant/Professor</td>
<td>3.9</td>
</tr>
<tr>
<td>Inspector/Investigation</td>
<td>3.4</td>
</tr>
<tr>
<td>Labor Representative</td>
<td>3.1</td>
</tr>
<tr>
<td>Safety Analyst</td>
<td>1.8</td>
</tr>
</tbody>
</table>

### Flight/Worker Safety and Compliance Motivate HF Programs

![Bar Chart](chart.png)
**Support from your Regulator?**

<table>
<thead>
<tr>
<th>Regulatory Model</th>
<th>% Support</th>
<th>% Work Closely</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>57.1</td>
<td>35.7</td>
</tr>
<tr>
<td>CASA</td>
<td>46.2</td>
<td>28.6</td>
</tr>
<tr>
<td>O-NAA</td>
<td>39.3</td>
<td>44.4</td>
</tr>
<tr>
<td>EASA</td>
<td>39.1</td>
<td>28.6</td>
</tr>
<tr>
<td>FAA</td>
<td>38.3</td>
<td>31.9</td>
</tr>
</tbody>
</table>

**MEDA is Event Investigation Tool**

Which of the following approaches does your operation use to investigate human error? Select all that apply:

- MEDA
- HFACS
- MOD-MEDA
- Other

Overall, EASA, FAA, Transport Canada, Other NAA
Do you check that suppliers have a QA program?

- Overall
- CASA
- EASA
- FAA
- Transport Canada
- Other NAA

HF Program Elements: Fatigue Management

- 82% said fatigue was an issue.
- 25% had Fatigue Management Systems.
- 36% had Training on Fatigue Management
Canada and EASA have the most HF Training

- Overall
- CASA
- EASA
- FAA
- Transport Canada
- Other NAA

% Respondents

Existing Course | Developing a Course | Send Employees | No Course

Overall:
- Canada
- EASA
- FAA
- Transport Canada
- Other NAA

HF Training for Instructors?

- Academic Degree in HF or Related Field: 16.3%
- University Diploma: 39%
- Attended short course in HF: 61%
- Attended short course on HF Instructor Training: 46.8%
- Maintenance Work Experience: 68.5%
- Licensed Mechanic/Engineer: 48.5%
- No formal training: 12.9%
Preparation of HF Trainers

Canada and EASA have the most Continuation Training
Recommendations (1)

- Worker safety, flight safety, regulatory compliance are important motivators when implementing an HF program.
- Strong Regs. make strong programs.
- Continue with existing HF content.
- Address Fatigue as an international issue.

Recommendations (2)

- Improve Instructor HF training
- Must capitalize on MEDA-like Data
- Conduct ROI
- Apply HF to technical documentation issues
## Agenda

- Demographics
- Why have a Human Factors Program
- Regulator Support & MEDA
- Training Program
- Recommendations
- Status of 2007 ASI Survey

### 2007 Survey to FAA Airworthiness ASIs

- Survey FAA Airworthiness Inspectors (ASIs) about maintenance human factors, to guide current and planned activities.
- Assess ASI
  - HF knowledge
  - HF attitude
  - Level of satisfaction with FAA HF support
  - Perception of industry programs
  - Perception of FAA ASI HF environment
- Survey is also an education/marketing tool
  - Promote FAA Mx HF activity
  - Promote Classes
  - Promote “Operator’s Manual”
  - Review Dirty Dozen from industry and from FAA work perspective
Simple Ways to Recall Human Factors in Maintenance

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April 12, 2007

Schedule

- FY07 Second Quarter
  - Negotiate union approval
  - Distribute survey to FAA ASIs
- FY07 Third Quarter
  - Archive returned survey responses
  - Report preliminary results of FAA ASI responses to ATO-P HF R&D, and AFS-330, and CSTA for Aviation Maintenance Human Factors
- FY07 Fourth Quarter
  - Complete survey analyses of FAA ASI results
  - Present findings to ATO-P HF R&D, and AFS-330, and CSTA for Aviation Maintenance Human Factors

We expect to find:

- 40-50% response rate
- Positive attitude about FAA human factors in general
- ASIs want more information
- ASIs did not know about the Operator’s Manual
- ASIs will identify “Stress” as one of the Dirty Dozen in their own job
- ASIs will be delighted that we are asking such questions
2007 HF Symposium

19th FAA/ATA International Symposium

Human Factors in Maintenance and Airport Service Safety

September 5-6, 2007
Evening “Kick-off” Reception on September 4, 2007
Hyatt Regency Orlando International Airport Hotel
Orlando, Florida, USA

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