

行政院所屬各機關因公出國人員報告書

(出國類別：實習)

BELL-412 型模擬機複訓報告書

服務機關：民用航空局

出國人 職 稱：助理航務檢查員

姓 名：丁作德

出國地區：美國，德州

出國期間：92.11.08-92.11.14

報告日期：93.01.08

H2/09300239

系統識別號:C09300239

公 務 出 國 報 告 提 要

頁數: 41 含附件: 是

報告名稱:

BELL-412型模擬機年度複訓報告書

主辦機關:

交通部民用航空局

聯絡人/電話:

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出國人員:

丁作德 交通部民用航空局 飛航標準組 約聘人員

出國類別: 實習

出國地區: 美國

出國期間: 民國 92 年 11 月 08 日 -民國 92 年 11 月 14 日

報告日期: 民國 93 年 01 月 15 日

分類號/目: H2/航空 H2/航空

關鍵詞: BELL-412型模擬機複訓報告書

內容摘要: 依據民航法規航空人員檢定給證規則，規定駕駛員檢定證有效期限為一年，為維持效期俾利航務查核作業，須依規定實施複訓。本次複訓使本人藉由訓練中心之專業師資授以BELL-412型機學、術科（模擬機）相關訓練，達到溫故知新的效果，亦對航務檢查員複訓制度與模擬機施訓之價值更加肯定其必要性。

本文電子檔已上傳至出國報告資訊網

BELL-412 型模擬機複訓報告書目次

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一、BELL-412 型機駕駛員複訓學、術科訓練配當表。

二、訓練中心核發之完訓暨合格證書。

三、組員資源管理 (CRM) 參考資料。

四、緊急醫療飛行作業參考資料。

BELL-412 型模擬機複訓報告書

壹、目的：

依據民航法規航空人員檢定給證管理規則第七條第一項規定駕駛員檢定證有效期限為一年，本人因持有 BELL- 412 型直昇機機種檢定證，為維持效期俾利航務查核作業，故依規定實施複訓。

貳、過程：

- 一、奉准於九十二年度內運用本局「派員出國進修研究實習計畫」之飛航安全檢查員專業訓練專案相關經費，接受 BELL-412 型直昇機之模擬機複訓。
- 二、協洽美國德州 FlightSafety 訓練中心安排受訓事宜，並定於 92.11.10 至 92.11.13 之受訓期程。
- 三、複訓課程包含地面學科及術科訓練二部分：如附件一
 - (一) 學科：合計 15.75 小時
 1. 載重與平衡。
 2. 飛機性能資料。
 3. 飛行計畫。
 4. 旋翼機飛行手冊。

5. 風切介紹與注意事項。
6. 組員資源管理 (CRM)。
7. 飛機各項系統解說 (含一般簡介、發動機系、滅火系、燃油系、電力系、燈光系、警告系、傳動系、旋翼系、飛行操縱系、液壓系、環控系、航電系及附屬裝備等)。
8. 飛行前任務提示。

註. 申請加訓直昇機 Category A 之起降操作及緊急醫療飛行作業。

(二) 術科 (模擬機訓練): 合計 4.5 小時

1. 一般操作: 含滯空及正常起降課目。
2. 特殊場地操作: 閉塞區及平台、峰頂起降。
3. 緊急課目操作: 包含單、雙發動機失效、火警、自動飛操失效、尾旋翼失效、液壓失效、電力失效等課目。
4. 儀器飛行: 包含不正常動作改正、ILS 進場等課目。
5. 緊急傷患後送作業 (EMS) 之狀況警覺、判斷與飛行操作。

四、完訓後，該訓練中心核發完訓暨合格證書 (如附件二)

參、心得

- 一、專業師資與教學方式: 由資深且學識經驗均豐富之飛航教師以其專業素養，將學理結合於實際操作背景，使學員充分體會、

融會貫通。

- 二、授課內容多樣化：除既定課程外，亦能視學員實務需求，加強各相關學術科訓練，如緊急醫療飛行作業、儀航或平台、高山起降等直昇機相關作業。
- 三、任務提示與歸詢之詳實：每於模擬機飛行前，飛航教師均能針對當日操作課目實施課目解說與飛行後檢討。
- 四、敬業精神良好：該訓練中心教師均極力配合施訓人員需求，熱心解答並提供相關資訊（如附件三、四）。

肆、建議：

因該訓練中心備有 BELL-412 型機 EMS 及儀器飛航訓練項目，爾後可視國內航空公司所備機型及其業務取向，請民航直昇機業者對國外已具備該型模擬機，選派教師駕駛員至國外接受相關訓練，俾利其完訓返國後對公司駕駛員施以經驗傳授，並藉以充實及提升國內駕駛員本職學識、策進飛安。

伍、附件

- 一、BELL-412 型機駕駛員複訓學、術科訓練配當表。
- 二、訓練中心核發之完訓證書。
- 三、組員資源管理 (CRM) 參考資料。(提供民航直昇機公司參考)
- 四、緊急醫療飛行作業參考資料。(提供民航直昇機公司參考)

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RECORD OF TRAINING

Tso Te Ting

Civil Aeronautics Administration ROC

during the period November 10, 2003 through November 13, 2003 has completed

FlightSafety's Bell 412, Recurrent Pilot Course

Model: *Bell 412*

Ground Training Curriculum

Fuel System	Ice and Rain Protection	Weight and Balance
Electrical System	Environmental System	Performance
Avionics	Flight Planning	Lighting
Caution Warning System	Kits and Accessories	Rotorcraft Flight Manual
Powertrain	Preflight	Windshear Training
Crew Resource Management	Main Rotor	Review/Exam/Critique
Aircraft General	Systems Integration	Tail Rotor
Flight Controls/AFCS	Powerplant	
Fire Protection	Hydraulics	

Ground Training Hours: 12.00
Briefing/Debriefing Hours: 5.25

Flight Training Curriculum

Flight Simulator: Pilot Flying.....	4.50	Aircraft: Pilot Flying.....	0.00
Pilot Not Flying.....	0.00	Total Hours:	0.00
Total Hours:	4.50		

Woody Woodruff
Manager

the best safety device in any aircraft is a well-trained pilot ...

Ft. Worth Bell Learning Center

13Nov03
Date
8315518-000

FlightSafety

international

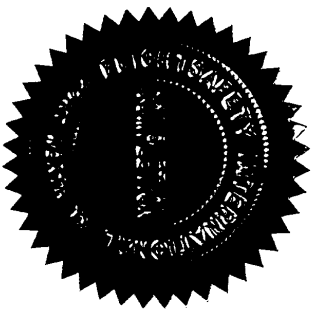
Certifies that

Tso Te Ting

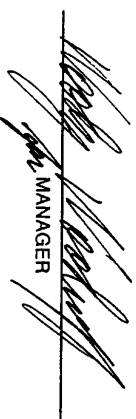
has satisfactorily completed a course of

Bell 412, Recurrent Pilot

13th day of November, 2003



the best safety device in any aircraft is a well-trained pilot...


Wendy Woodbury
MANAGER

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION



Pilot Proficiency Award Program

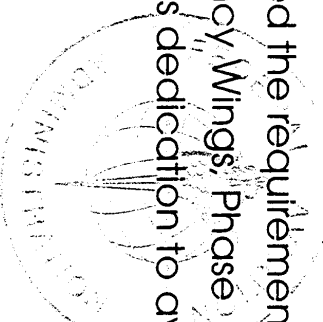
This is to certify that

Tso-Te Ting

has satisfactorily completed the requirements to become eligible to wear the Pilot Proficiency Wings, Phase III attesting to this individual's dedication to aviation safety.

11 November 2003

Date



Norris M. Woodruff
Aviation Safety Counselor
Ft. Worth Flight Standards District Office


Signature

附件三



Scope

During this period, we will discuss:

- + Situational Awareness and the Error Chain
- + Stress
- + Communications
- + Synergy and Crew Concept
- + Workload Management
- + Decision making .

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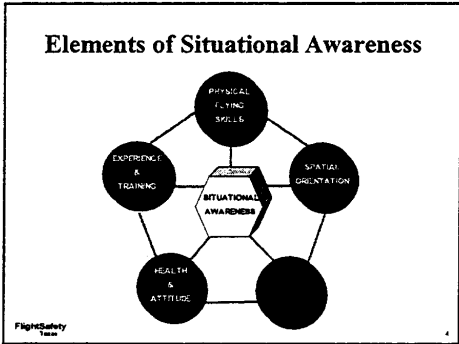
Situational Awareness

+ "The accurate perception of the factors and conditions that affect an aircraft and its flight crew during a defined period of time"

+ Simply put:

+
Knowing what the heck is going on around you!

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Experience & Training

- + Practical knowledge, or skill derived from direct observation or participation
- + Experience create a “mental file” that helps establish how one interprets and responds to conditions and events
- + The experience file allows one to solve problems more quickly

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Physical Flying Skills

- + FLYING THE AIRCRAFT REMAINS THE HIGHEST ORDER OF PRIORITY, REGARDLESS OF OTHER DEMANDS FOR THE PILOT'S ATTENTION
- + “All corrective actions listed herein assume the pilot gives first priority to aircraft control and a safe flight path”

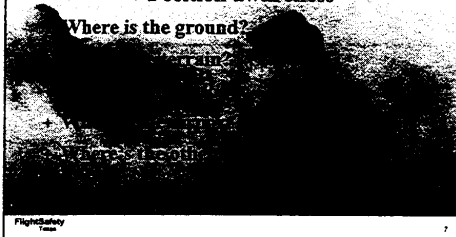
- Bell Helicopter
Rotorcraft Flight Manuals

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Spatial Orientation

+ Position awareness

Where is the ground?



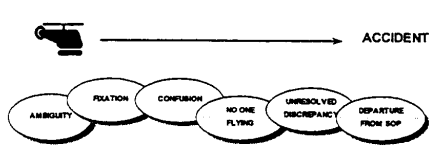
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Health and Attitude

- + Fatigue
- + diminishes perception
- + Visual acuity deteriorates
- + Mental processes slow
- + Stress
- + can alter interpretation of environment or events
- + Attitude
- + A professional attitude is a personal commitment to safety

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The Error Chain



Clues to the loss of Situational Awareness

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+ The Links in the Error Chain

- + Tend to occur sequentially
- + May or may not be related to each other
- + May not be readily apparent to the crew

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Links in the Error Chain

Clues that signal the loss of Situational Awareness by the crew may also be signs of an error chain in progress

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Remember!

- + Error chains can be broken at any point
- + No matter who forges the first links, the crew has the ultimate responsibility for breaking the chain



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Stress

“A person’s response to a variety of physically, mentally, or emotionally disruptive influences”

These disruptive influences are known as “Stressors”

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Effects of Stress on Judgment and Decision Making

- + Rushing
- + Tunnel vision
- + Losing the big picture
- + Failure to take all factors into account
- + Snap judgments
- + Won’t listen to input

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Coping with Stress in Ourselves

- + Be aware of symptoms
- + Relaxation techniques
- + Time out
- + Ask for help
- + Slow down
- + Focus on the problem

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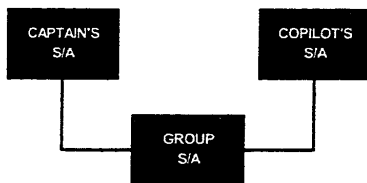
Stress Summary

- + Like fatigue, stress is a natural response of your body
 - Don't ignore it!
- + Stress can have severe negative effects on performance
 - Take it seriously!
- + There is no single solution to managing stress
 - Find out what works for you!

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Situational Awareness in the Cockpit



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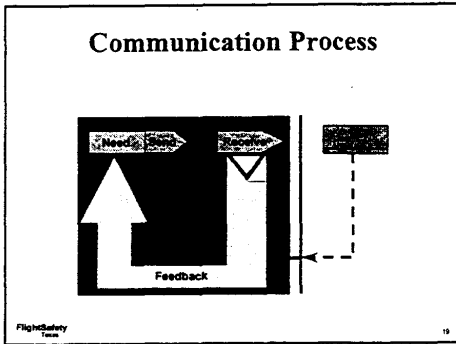
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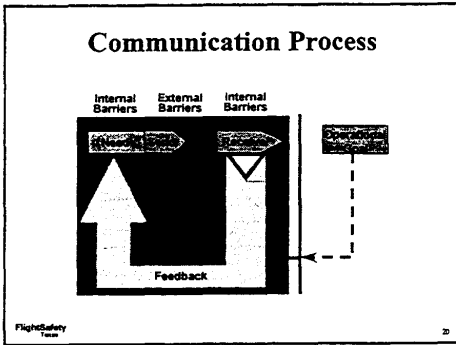
Effective Communication

**Exchanging information,
thoughts, and feelings in a
clear and understandable
manner**

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Barriers to Communication

Internal?

External?

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What are some internal barriers to communication?

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Internal Barriers

- + Listening Skills
- + Health
- + Emotions
- + Stress
- + Ego
- + Preconceived Ideas
- + Bias
- + Previous Experience

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What are some external barriers to communication?


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External Barriers

<p>+ Organizational Culture</p> <ul style="list-style-type: none"> - Rank - Age - Gender 	<p>+ Languages</p> <p>+ Discomfort</p> <p>+ Environment</p> <ul style="list-style-type: none"> - Light - Temperature - Noise
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Breaking Down Barriers

<p>+ Inquiry</p> <p>+ Advocacy</p> <p>+ Assertion</p>	
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Inquiry

+ A tool for increasing your own Situational Awareness

- Carefully directed
- Clear and concise questions
- Relate concerns accurately
- Ask for feedback
- Keep an open mind
- Draw conclusions from valid information

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Advocacy

+ A tool for increasing someone else's Situational Awareness

- State position
- Suggest solutions
- Be persistent
- Timely
- Listen carefully
- Keep an open mind

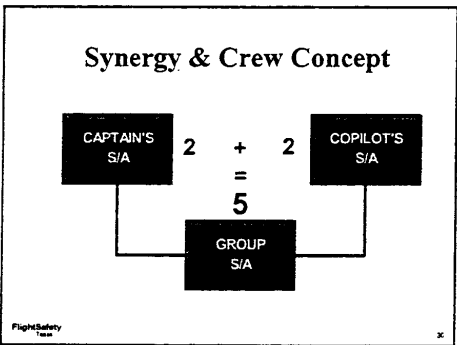
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Assertion

+ A tool for getting your point across

- Speak up with appropriate persistence
- Keep focus on "what's right", not "who's right"
- Treat other crewmembers with empathy and respect
- Non-defensive
- If time permits, explain why decisions were made

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Cockpit Management

+ The use and coordination of all of the skills and resources available to the flight crew to achieve the established goal of safety, efficiency, and comfort of flight.

+ IT IS THE MEANS BY WHICH THE PILOT MIGHT ACHIEVE AND MAINTAIN SITUATIONAL AWARENESS

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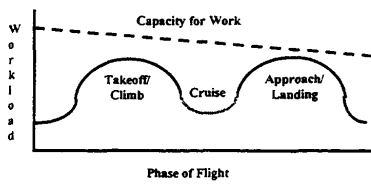
Workload Distribution

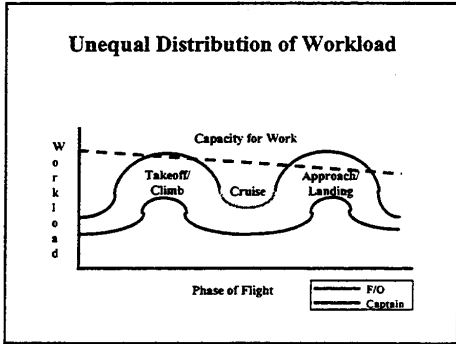
- + Finite capacity for work
- + Exceeding capacity = mistakes and failures
- + Capacity decreases as fatigue sets in
- + If workloads are not distributed effectively, one or more crewmembers may exceed capacity

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Workload Varies by Phase of Flight

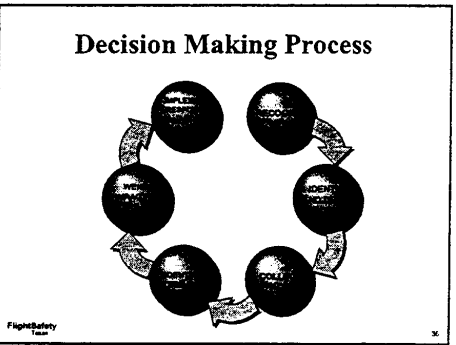




Decision Making Process

How do YOU make a decision?

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Decision Making Hints

- + Identify the problem
- + Consider appropriate SOPs
- + Think beyond the obvious alternatives
- + Avoid biasing your information
- + Make decisions as a result of the process
- + Resist temptation to make a decision and then gather facts to support it

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Summary

During this period, we discussed:

- + Situational Awareness and the Error Chain
 - + Stress
- + Communications
- + Synergy and Crew Concept
- + Workload Management
- + Decision making

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Texas

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2/14/04

NEMSPA RECOMMENDED PRACTICES

In 1992, NEMSPA approached the FAA for assistance in developing a program that would allow air medical operators to improve safety through training. The FAA agreed to fund the development of a safety program to avert accidents and federal regulation. The Recommended Practices members are formed from aviation professionals throughout the air medical industry. They include pilots, representatives from the FAA, NASA, airframe manufacturers, air ambulance operators, helicopter training specialists, and specific air medical representatives. Collectively, the group agreed to establish an ongoing committee to review and develop guiding principals for the EMS industry.

The following NEMSPA Recommended Practices were developed through an initial series of workshops designed to provide an ongoing forum for addressing risks and creating solutions in our industry. They form a base of recommended practices that will continue to grow as areas of risks are identified.

Special thanks go to **Craig Lunaas**, past NEMSPA president, and **Catherine Adams**, *Advanced Aviation Concepts*, for being the driving forces to start the process and keep the committee focused. And to all the committee members who have tirelessly committed their time and resources to this effort.

Kerry Berg
President
National EMS Pilots Association

TABLE OF CONTENTS

RP # and Topic

1. VFR Weather Minimums, Non Mountainous Terrain
2. Takeoff Hazards
3. Landing Hazards
4. Checklists-Aircraft Operations
5. Inadvertent IMC/Loss of Visual Reference
6. Air Medical Operational Profile Check
7. Hazardous Weather Avoidance
8. Hazardous Materials
9. New Policies and Procedures
10. Biohazards

11. Pilot-In-Command Authority

12. Crew Resource Management

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP 93-1:

VFR Weather Minimums, Non-Mountainous Terrain

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Define minimum VFR weather criteria.

1.2 Discussion

These are minimum requirements based on level terrain, and should not be construed as safe for all programs.

1.3 Applications-

Helicopter _____

Fixed Wing _____

1.4 Definitions

Non-Mountainous

Mountainous

Local Area

Cross Country

Ceiling in feet above ground level

Visibility in statute miles

1.5 Applicability

1.5.1 Pilots _____

1.5.2 Medical Crew Members _____

1.5.3 Communicators _____

1.5.4 Auxiliary Personnel _____

1.6 Operational Applicability

1.6.1 Regional Areas of operation Non- Mountainous

1.6.2 Types of operation

1.6.2.1. VFR _____

1.6.2.2 Single Engine/Twin Engine _____

1.6.2.3 Day/Night _____

1.6.2.4 Special Operations _____

1.6.2.5 Other _____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation

AC135-14A, FAR 95

- 2.2 Industry Data ____
- 2.3 Surveys ____
- 2.4 Reasonable and Prudent Operating Practices ____

3.0 REGULATORY COMPLIANCE

- 3.1 FARs
- 3.2 OSHA ____

4.0 IMPLEMENTATION

4.1 Managerial

Manager should establish safe program minimums based on, but not limited to terrain, known obstructions, local weather phenomenon, aircraft equipment speed and ground lights. Managers should also reiterate that these minimums apply as launch criteria, and support the pilots decision to turn down flights due to weather.

4.2 Content of Instruction

Before Flight - Pilot ensures that launch criteria are met.

Enroute - If weather lower than minimums is encountered, the flight is aborted and appropriate action is taken.

NON MOUNTAIN DAY		NON-MOUNTAIN NIGHT	
LOCAL	X-COUNTRY	LOCAL	X-COUNTRY
500-1	800-2	800-2	1000-3
MOUNTAIN DAY		MOUNTAIN NIGHT	
LOCAL	X-COUNTRY	LOCAL	X-COUNTRY
NEXT RP	NEXT RP	NEXT RP	NEXT RP

4.3 Cycle

Initial and Recurrent

Pilot Meetings

Continuing Awareness of Hazards

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP 93-2:

TAKEOFF HAZARDS

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Enhance the Pilot's knowledge and awareness through "Procedural Discipline" and increased training to prevent collision with obstruction and hazards.

1.2 Discussion

The only guaranteed clear area is an airport runway. A pilot must treat all other departures as if hazards exist. Pilots should be trained in local surface phenomena such as whiteout, brownout.

1.3 Applications

Helicopter _____

Fixed Wing _____

1.4 Definitions

Airport - an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

Heliport-an area of land or water that is used or intended to be used for the landing and takeoff of helicopters.

HIGE Hover in ground effect.

HOGE Hover out of ground effect

Runway - A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.

Unprepared area - any other surface used for landing, other than 1.4.1 and 1.4.2

1.5 Applicability

1.5.1 Pilots _____

1.5.2 Medical Personnel _____

1.5.3 Communicators _____

1.5.4 Auxiliary Personnel _____

1.6 Operational Applicability

1.6.1 Regional Areas of Operation

1.6.2 Types of operation

1.6.2.1 IFR/VFR _____

1.6.2.2 Single Engine/Twin Engine _____

1.6.2.3 Day/Night _____

1.6.2.4 Special operation _____

1.6.2.5 Other _____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation _____

2.2 Industry Data _____

2.3 Surveys _____

2.4 Reasonable and Prudent Operating Practices _____

2.5 OTHER _____

3.0 REGULATORY COMPLIANCE

3.1 FAR's _____

3.2 OSHA _____

4.0 IMPLEMENTATION

4.1 Managerial

4.2 Content of Instruction

4.3 Cycle

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP 93-3:

LANDING HAZARDS

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Enhance the Pilot's knowledge and awareness by increased training to prevent collision with obstructions and hazards including "Procedural Discipline."

1.2 Discussion

The only guaranteed clear area is an airport runway. Treat all other landings as if there are potential hazards.

1.3 Applications-Helicopter ____

1.4 Definitions, Abbreviations and Symbols

1.4.1 Airport-an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

1.4.2 Heliport-an area of land, water or structure that is used or intended to be used for the landing and takeoff of helicopters.

1.4.3 HIGE - Hover-in-ground-effect

1.4.4 HOGE - Hover out of ground-effect

1.4.5 Runway - A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.

1.4.6 Other - Treat as if all hazards exist

1.5 Applicability

1.5.1 Pilots ____

1.5.2 Medical Crew members ____

1.5.3 Communicators ____

1.5.4 Auxiliary Personnel ____

1.6 Operational Applicability

1.6.1 Regional Areas of operation ALL

1.6.2 Types of operation

1.6.2.1. IFR/VFR ____

1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____

1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation

2.1.1 NTSB-Accident Statistics ____

- 2.1.2 FAA/AAC Study -See Takeoff Hazards ____
- 2.1.3 NASA Study-See Takeoff Hazards ____
- 2.2 Industry Data
- 2.3 Surveys
- 2.4 Reasonable and Prudent Operating Practices' ____
- 3.0 REGULATORY COMPLIANCE
- 3.1 FAR's ____
- 3.2 OSHA ____
- 3.3 Other - Operator's Manual ____
- 4.0 IMPLEMENTATION
- 4.1 Managerial: Provide Adequate ground and flight training to accomplish this task.
- 4.2 Content of Instruction
 - 4.2.1 Day/Night Differences in Requirements Training
 - 4.2.2 High/Low Recognition
 - 4.2.3 Settling with Power
 - 4.2.4 Loss of Tail Rotor Effectiveness
 - 4.2.5 Noise Abatement Awareness Training
 - 4.2.6 Communications with Ground
 - 4.2.7 Minimum Area Required and Surface Condition
 - 4.2.8 Performance Planning Card
 - 4.2.9 Lighting (Ground and Auxiliary Aircraft)
 - 4.2.10 Aborted Landing (Snow, dust, wire, vehicle on LZ)
- A.Obstruction/visibility related
- B.Performance Related
 - 1. Time to Transition from descent to climb
 - 2. Power Management
- C.LDP considerations/Use
- D.Avoid Hospital Over flights (antennas)
- 4.3 Cycle
- Initial training including both day and night and recurrent training
- Pilot Meetings
- Continuing Awareness of Risks (Old and New)

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP 93-4:

CHECKLISTS-AIRCRAFT OPERATIONS

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Pilot should be provided with and shall use an accepted checklist which should include EMS specific items.

1.2 Discussion

The checklist should be conveniently located for the pilot and in an "Easy to Use" format.

1.3 Applications

Helicopter ____

Fixed Wing ____

1.4 Definitions, Abbreviations and Symbols

1.5 Applicability

1.5.1 Pilots ____

1.5.2 Medical Crewmembers ____

1.5.3 Communicators ____

1.5.4 Auxiliary Personnel ____

1.6 Operational Applicability

1.6.1 Regional Areas of operation ALL

1.6.2 Types of operation

1.6.2.1. IFR/VFR ____

1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____

1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation ____

2.2 Industry Data ____

2.3 Surveys ____

2.4 Reasonable and Prudent Operating Practices ____

2.5 Other-NASA "EMS Helicopter Incidents Reported

3.0 REGULATORY COMPLIANCE

3.1 FAR's - legal requirement

4.0 IMPLEMENTATION

4.1 Managerial: Provide a current accepted checklist in usable form

4.2 Content of Instruction

Method of use

EMS specific items

Program specific format

4.3 Cycle

Initial

Recurrent

Change of Equipment

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP93-5

INADVERTENT IMC/LOSS OF VISUAL REFERENCE

ISSUED 1993-09-01

1.0 SCOPE

1.1 Purpose

Encompass training to enable pilots to recover from inadvertent loss of visual reference, under IMC or VMC.

1.2 Discussion

Pilots should recognize and be proficient in recovering the aircraft from a loss of visual reference. Loss of visual reference can be caused by inadvertent IMC, surface phenomena, loss of visual horizon, loss of external visual cues

1.3 Applications

Helicopter _____

Fixed Wing _____

1.4 Definitions

Spatial Disorientation - the inability to determine accurately the attitude or motion of the aircraft in relation to the Earth's surface as a result of loss of one or more sensory systems, visual sensing, motion sensing and position sensing.

IMC - Instrument meteorological Conditions

VMC - Visual meteorological conditions

Proficiency - Performance of assigned task with expert correctness and facility.

1.5 Applicability

1.5.1 Pilots _____

1.5.2 Medical Crew Members _____

1.5.3 Communicators _____

1.5.4 Auxiliary Personnel _____

1.6 Operational Applicability

1.6.1 Regional Areas of Operation ALL

1.6.2 Types of operation

1.6.2.1 IFR/VFR _____

1.6.2.2 Single Engine/Twin Engine _____

1.6.2.3 Day/Night _____

1.6.2.4 Special operation _____

1.6.2.5 Other _____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation _____

NTSB-EMS study, NASA

2.2 Industry Data _____

Aeromedical Journal

2.3 Surveys _____

Aeromedical Journal

NEMSPA

2.4 Reasonable and Prudent Operating Practices _____

2.5 OTHER _____

3.0 REGULATORY COMPLIANCE

3.1 FAR's _____

3.2 OSHA _____

4.0 IMPLEMENTATION

4.1 Managerial - Ensure all levels of management understand and support procedures. Ensure training support for proficiency of IMC/Loss of visual reference recovery procedures. Identify and establish written plan for IMC/Loss of visual reference recovery.

4.2 Content of Instruction-For loss of visual reference due to surface phenomena, refer to Recommended practices "Takeoff Hazards" (RP93-2) and "Landing Hazards" (RP93-3).

4.3 Cycle

Initial and recurrent

Continuing awareness of risks and during pilot meetings.

NEMSPA RECOMMENDED PRACTICES

NEMSPA NO. RP 93-6:

AIR MEDICAL OPERATIONAL PROFILE CHECK

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Validate the pilots ability to perform air ambulance profile.

1.2 Discussion

Pilots should be evaluated on the multitude of tasks associated with the air ambulance industry.

1.3 Applications

Helicopter _____

Fixed Wing _____

1.4 Definitions

1.5 Applicability

1.5.1 Pilots _____

1.5.2 Medical Crew members _____

1.5.3 Communicators _____

1.5.4 Auxiliary Personnel _____

1.6 Operational Applicability

1.6.1 Regional Areas of operation ALL

1.6.2 Types of operation

1.6.2.1. IFR/VFR _____

1.6.2.2 Single Engine/Twin Engine _____

1.6.2.3 Day/Night _____

1.6.2.4 Special Operations _____

1.6.2.5 Other _____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation _____

2.2 Industry Data _____

2.3 Surveys-NEMSPA _____

2.4 Reasonable and Prudent Operating Practices _____

2.5 Other _____

3.0 REGULATORY COMPLIANCE

3.1 FAR's _____

3.2 Other _____

4.0 IMPLEMENTATION

4.1 Managerial: Pilots should be trained to accomplish an air ambulance profile.

4.2 Content of Instruction

Training should include:

- a. Preflight planning
 - b. All flight Phases-approach, departure, enroute
 - c. Flight following
 - d. Communications
 - e. Coordination
 - f. Inadvertent IMC recovery procedures
 - g. If possible land at a simulated scene
- 4.3 Cycle
- 4.3.1 Initial (Day and Night)
 - 4.3.2 Recurrent (Day and Night if possible)
 - 4.3.3 Site Orientation

NEMSPA RECOMMENDED PRACTICES

NEMSPA NO. RP 93-6:

AIR MEDICAL OPERATIONAL PROFILE CHECK

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Validate the pilots ability to perform air ambulance profile.

1.2 Discussion

Pilots should be evaluated on the multitude of tasks associated with the air ambulance industry.

1.3 Applications

Helicopter ____

Fixed Wing ____

1.4 Definitions

1.5 Applicability

1.5.1 Pilots ____

1.5.2 Medical Crew members ____

1.5.3 Communicators ____

1.5.4 Auxiliary Personnel ____

1.6 Operational Applicability

1.6.1 Regional Areas of operation ALL

1.6.2 Types of operation

1.6.2.1. IFR/VFR ____

1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____

1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation ____

2.2 Industry Data ____

2.3 Surveys-NEMSPA ____

2.4 Reasonable and Prudent Operating Practices ____

2.5 Other ____

3.0 REGULATORY COMPLIANCE

3.1 FAR's ____

3.2 Other ____

4.0 IMPLEMENTATION

4.1 Managerial: Pilots should be trained to accomplish an air ambulance profile.

4.2 Content of Instruction

Training should include:

- a. Preflight planning
- b. All flight Phases-approach, departure, enroute
- c. Flight following
- d. Communications
- e. Coordination
- f. Inadvertent IMC recovery procedures
- g. If possible land at a simulated scene

4.3 Cycle

- 4.3.1 Initial (Day and Night)
- 4.3.2 Recurrent (Day and Night if possible)
- 4.3.3 Site Orientation

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP NO 93-7:

HAZARDOUS WEATHER AVOIDANCE

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Ensure Pilot is provided adequate training in recognition and avoidance of hazardous weather.

1.3 Applications

Helicopter _____

Fixed Wing _____

1.4 Definitions, Abbreviations and Symbols

1.3.1 Hazardous Weather - Weather that would adversely affect the safe completion of the flight.

1.3.2 Management Personnel

1.3.2.1 Aviation

1.3.2.2 Hospital

1.3.3 Abbreviations

Minimum Safe Altitude MSA

Instrument Meteorological Conditions IMC

Visual Meteorological Conditions VMC

1.4 Applicability

1.4.1 Pilots _____

1.4.2 Medical Crew members _____

1.4.3 Communicators _____

1.4.4 Auxiliary Personnel _____

1.5 Operational Applicability

1.5.1 Regional Areas of operation ALL

1.5.2 Types of operation _____

1.5.2.1. IFR/VFR _____

1.5.2.2 Single Engine/Twin Engine _____

1.5.2.3 Day/Night _____

1.5.2.4 Special Operations _____

1.5.2.5 Other _____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation _____

NTSB-Accident briefs 1986-1991

NASA Study (Connell, Reynard, 4-93)

Advisory Circulars

Aeronautical Decision Making Manuals

2.2 Industry Data _____

AAMS, NEMSPA, HAI, NATA

2.3 Surveys _____

NATA, AAMS, HAI

2.4 Reasonable and Prudent Operating Practices _____

3.0 REGULATORY COMPLIANCE

3.1 FARs

3.2 Other - OSHA

4.0 IMPLEMENTATION

4.1 Managerial: Ensure all levels support [understand their role and understand procedures for avoidance. Recognize pilot's decision making role. PIC is final authority. Management should avail aviation the equipment to make viable weather decisions.

4.2 Content of Instruction: Utilize instructors qualified in interpretation of weather, local weather patterns, deterioration of weather, weather decision making, automated services, special equipment. Ensure specifics to individual program area are covered (Regulatory, training manual, policy manuals, operation manuals), VCR, Tests, Instructor, (APM. FSS, Commercial).

4.3 Cycle: Initial new hire, annual recurrent, site specific equipment for obtaining weather information, (as required). Seasonal weather instruction.

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP 93-8:

HAZARDOUS MATERIALS

ISSUED 1993-09-11

1.0 SCOPE

1.1 Purpose

Provide the PIC with the level of training necessary to recognize and respond to hazardous materials incidents.

1.2 Discussion

Hazardous materials can be ground, air, patient or medically related.

1.3 Applications

Helicopter _____

Fixed Wing _____

1.4 Definitions

1.5 Applicability

1.5.1 Pilots _____

1.5.2 Medical Crew members _____

- 1.5.3 Communicators ____
- 1.5.4 Auxiliary Personnel ____
- 1.6 Operational Applicability
 - 1.6.1 Regional Areas of operation ALL
 - 1.6.2 Types of operation
 - 1.6.2.1. IFR/VFR ____
 - 1.6.2.2 Single Engine/Twin Engine ____
 - 1.6.2.3 Day/Night ____
 - 1.6.2.4 Special Operations ____
 - 1.6.2.5 Other ____
- 2.0 SUBSTANTIATING INFORMATION
 - 2.1 US Government Data and Documentation ____
US DOT Hazardous Materials AC
American Trucking Association Data
 - 2.2 Industry Data ____
 - 2.3 Surveys ____
 - 2.4 Reasonable and Prudent Operating Practices ____
 - 2.5 Other ____
- 3.0 REGULATORY COMPLIANCE
 - 3.1 FAR's
 - 3.2 Other - OSHA ____
- 4.0 IMPLEMENTATION
 - 4.1 Managerial: Ensure support and that pilots are trained to recognition and hazardous material incidents.
 - 4.2 Content of Instruction: Awareness of potential hazard. Recognition of potential hazard, flight precaution when hazmat identified, decontamination of individual prior to transport, post flight decontamination.
 - 4.3 Cycle
Annual
Awareness - continual

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP-9:

New Policies and Procedures

ISSUED 1994-4-21

1.0 SCOPE

1.1 Purpose: To identify and establish written policies and procedures that are not covered by Operations and Specifications.

1.2 Discussion

To recognize the need to have written policies and procedures for personnel to follow for safe and efficient operations written guidelines need to be established.

1.3 Applications-

Helicopter ____

Fixed Wing ____

1.4 Definitions

1.5 Applicability

1.5.1 Pilots ____

1.5.2 Medical Crew Members ____

1.5.3 Communicators ____

1.5.4 Auxiliary Personnel ____

1.6 Operational Applicability

1.6.1 Regional Areas of operation All

1.6.2 Types of operation

1.6.2.1 IFR/VFR ____

1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____

1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation ____

2.2 Industry Data ____

2.3 Surveys ____

2.4 Reasonable and Prudent Operating Practices ____

2.5 OTHER ____

3.0 REGULATORY COMPLIANCE

3.1 FAR's ____

3.2 OSHA ____

4.0 IMPLEMENTATION

4.1 Managerial: Identify, define and adopt policies and procedures

4.2 Content of Instruction: N/A

4.3 Cycle: Initial, annual, recurrent and as required.

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP 94-13

BIOHAZARDS

ISSUED 1994-09-15

1.0 SCOPE

1.1 Purpose

To recognize of the dangers of biological hazards, implement a plan to minimize exposure and decontaminate exposed personnel and aircraft, and recommend procedures for addressing significant exposure.

1.2 Discussion

Personnel involved with air medical operations are routinely exposed to potentially infectious materials. Organisms are spread through various means, including direct contact and/or airborne transmission.

1.3 Applications

Helicopter _____

Fixed Wing _____

1.4 Definitions

Infectious materials

Exposure routine, significant

Decontamination

Personal protective equipment

Universal precautions

1.5 Applicability

1.5.1 Pilots _____

1.5.2 Medical Crew Members _____

1.5.3 Communicators _____

1.5.4 Auxiliary Personnel _____

1.6 Operational Applicability

1.6.1 Regional Areas of Operation

1.6.2 Types of operation

1.6.2.1 IFR/VFR _____

1.6.2.2 Single Engine/Twin Engine _____

1.6.2.3 Day/Night _____

1.6.2.4 Special operation _____

1.6.2.5 Other _____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation _____

OSHA regulations

2.2 Industry Data _____

Center for Disease control MMR 12/93 (TB)

2.3 Surveys _____

2.4 Reasonable and Prudent Operating Practices _____

2.5 OTHER _____

3.0 REGULATORY COMPLIANCE

3.1 FAR's _____

3.2 OSHA 29 CFR 1910.1030

4.0 IMPLEMENTATION

4.1 Managerial-Provide & support a plan for compliance with regulations considering exposure to potentially infectious materials.

4.2 Content of Instruction

4.2.1 Recognition of potentially infectious materials

4.2.2 Use of protective equipment implementation of universal precautions

4.2.3 Decontamination of equipment

4.2.4 Immunization, TB surveillance and other methods of prevention

4.3 Cycle - Initial, recurrent and event specific.

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP94-11

Pilot-In Command Authority

ISSUED 1994-4-21

1.0 SCOPE

1.1 Purpose: to clarify the authority of the Pilot-in-Command (PIC)

1.2 Discussion

The PIC has the final authority for the operation of the aircraft.

1.3 Applications-

Helicopter ____

Fixed Wing ____

1.4 Definitions

1.5 Applicability

1.5.1 Pilots ____

1.5.2 Medical Crew Members ____

1.5.3 Communicators ____

1.5.4 Auxiliary Personnel ____

1.6 Operational Applicability

1.6.1 Regional Areas of operation

1.6.2 Types of operation ____

1.6.2.1. IFR/VFR ____

1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____

1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US Government Data and Documentation ____

2.2 Industry Data ____

2.3 Surveys ____

2.4 Reasonable and Prudent Operating Practices ____

2.5 OTHER ____

3.0 REGULATORY COMPLIANCE

3.1 FAR's ____

3.2 OSHA ____

4.0 IMPLEMENTATION

4.1 Managerial: Assure that all personnel associated with aeromedical operations understand and support the authority and responsibilities of the PIC in operation of the aircraft.

4.2 Content of Instruction: FAR 91.3

4.3 Cycle: Continuous

NEMSPA RECOMMENDED PRACTICES

NEMSPA RP-12:

DRAFT - CREW RESOURCE MANAGEMENT

ISSUED 1994-__-__

1.0 SCOPE

1.1 Purpose

To increase the safety and efficiency of flight operations through improved coordination and communication, and the effective use of all available resources; human resources, hardware, and information.

1.2 Discussion

Investigations into the cause of accidents have shown that human error is a contributing factor in 60 to 80 percent of all aeromedical operations. Many problems encountered by flightcrews have very little to do with the technical aspects of operating in a cockpit. Instead, problems are associated with poor decision making, ineffective communication, inadequate leadership, and poor task or resource management. Pilot training programs historically focused almost exclusively on the technical aspects of flying and on an individual pilot's performance; they did not effectively address crew management issues that are also fundamental to safe flight.

- a. These observations have led to a consensus in industry and government that training programs should place emphasis on the factors which influence crew coordination and the management of crew resources.
- b. Coordinated efforts by representative from the aviation community have produced recommendations for CRM training programs. While compliance is not mandatory, these recommendations provide a useful reference for understanding the critical elements of CRM training.
- c. Continuing NASA and FAA measurements of the impact of CRM training show that after initial indoctrination significant improvement in attitudes occurs regarding crew coordination and flight deck management. In programs that also provide recurrent training and practice in CRM concepts, significant changes have been recorded in flightcrew performance during Line Oriented Flight Training

(LOFT) and during actual flight. CRM-trained crews operate more effectively as teams and cope more effectively with nonroutine situations.

d. Research also shows that when there is no effective reinforcement of CRM concepts by way of recurrent training, improvements in attitudes observed after initial indoctrination tend to disappear, and individuals' attitudes tend to revert to former levels.

1.3 Application

Helicopter _

Fixed Wing _

1.4 Definitions

1.4.1 Human Factors: Human factors is the applied science which studies people working together in concert with machines. Variables which influence individual and team or crew performance include inadequate system design, operator training and/or design and management of crew tasks can contribute to group errors that lead to system performance degradation.

1.4.2 Crew Resource Management (CRM): The application of team management concepts in the flight deck environment, cabin crew, maintenance personnel and other available resources - human, hardware, and information. A current definition includes all other groups routinely working with the cockpit crew who are involved in decisions required to operate a flight safely. These groups include but are not limited to:

(i) aeromedical communications specialists

(ii) medical personnel

(iii) maintenance personnel

(iv) air traffic controllers

(v) first responders

CRM is one way of addressing the challenge of optimizing the human/machine interface and accompanying interpersonal activities. These activities include team building and maintenance, information transfer, problem solving, decision making, maintaining situational awareness, and dealing with automated systems. CRM training is comprised of three components: initial indoctrination or awareness, recurrent practice and feedback, and continual reinforcement. Each component must be continually renewed.

1.5 Applicability

1.5.1 Pilots ____

1.5.2 Medical personnel ____

1.5.3 Managers (operational and medical) ____

1.5.4 Communicators ____

1.5.5 Auxiliary Personnel ____

1.6 Operational Applicability

1.6.1 Regional Areas of operation ALL

1.6.2 Types of operation

1.6.2.1 IFR/VFR ____

1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____ 1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US governmental Data & Documentation

2.1.1 FAA Advisory Circular 120-51A - Crew Resource Management Training

2.1.2 FAA Advisory Circular 120-35B - Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation

2.1.3 FAA Advisory Circular 120-54 - Advanced Qualification Program

2.1.4 DOT/FAA/RD-92/26 - Crew Resource Management: An Introductory Handbook

2.1.5 NASA - Cockpit Resource Management Training: Proceedings of a NASA/MAC Workshop, (NASA CP 2455), May 6-8. 1982.

2.1.6 NASA/ASRS - "Emergency Medical Service Helicopter Incidents Reported to the Aviation Safety Reporting System," Connell, L. & Reynard, W. (1993). Proceedings of the Seventh International Symposium on Aviation Psychology, pp. 1001-8.

2.1.7 NASA/ASRS - "Common Pitfalls Leading to Incidents in the Emergency Medical Helicopter Operation." Connell, L. (1993). Aerospace Medical Association, 64th Annual Scientific Meeting. Published abstract in Aviation, Space, and Environmental Medicine.

2.1.8 DOT/FAA/PM - 86/45 - Aeronautical Decision Making for Helicopter Pilots. Adams, R. & Thompson, J. (1987).

2.1.9 DOT/FAA/PM - 86/42 - Aeronautical Decision Making for Commercial Pilots. Jensen, R. & Adrion, J. (1988).

2.1.10 DOT/FAA/DS - 88/5 - Aeronautical Decision Making for Air Ambulance Helicopter Pilots: Learning From Past Mistakes. Adams, R. & Thompson, J. (1988).

2.1.11 DOT/FAA/DS - 88/6 - Aeronautical Decision Making for Air Ambulance Helicopter Pilots: Situational Awareness Exercises. Adams, R. & Thompson, J. (1988).

Military Resources

2.2 Industry Data

Joel Harris, FSI, 1994 EMS Study, Aeromed Journal, Trade Journals

121 Operators, 135 Operators

2.3 Surveys

2.4 Reasonable and Prudent Practices _

2.5 OTHER

2.5.1 Cockpit Resource Management (1993). Wiener, E., Kanki, B., & Helmreich, R. Academic Press.

3.0 REGULATORY COMPLIANCE

3.1 FAR 135.321- Applicability and terms used, 323-Training program: General; 329-Crewmember training requirements

4.0 IMPLEMENTATION

4.1 Managerial

4.1.1 Research and airline experience suggest that the greatest benefits of CRM training are achieved by adhering to the following managerial practices:

- A. Assess the status of the organization before implementation.
- B. Get commitment from all managers, starting with senior managers.
- C. Customize the training to reflect the nature and need of the organization.
- D. Define the scope of the program.
- E. Communicate the nature and scope of the program before startup.
- F. Institute quality control procedures.
- G. Allocate resources

(AC Section 9 - Fundamentals of CRM Training Implementation, p. 6-7)

4.2 Content of Instruction-General topics listed below are typically included in many current CRM programs. Specific content of the training and organization of these topics should reflect the particular organization's culture, mission objectives, and needs.

4.2.1 Communication Processes and Decision Behavior

- (1)briefings
- (2)inquiry/advocacy/assertion
- (3)crew self-critique (debriefings)
- (4)conflict resolution
- (5)communication skills and decision making

4.2.2 Team Building and Maintenance

- (1)leadership/followership/concern for task
- (2)interpersonal relationship/group climate
- (3)workload management and situational awareness
- (4)individual factors/stress management

4.2.3 Special Topics (specific to organizational needs)

- (1)introduction to advanced automation
(accompanying transition to new aircraft)
- (2)human factors aspects of command
(accompanying Captain upgrade training)
- (3)initial training

4.3 Cycle

4.3.1 Initial New Hire

4.3.2 Recurrent Practice and Feedback

4.3.3 Continuing Reinforcement

4.3.4 Instructors and Evaluators

Updated: Friday, December 22, 1995

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1.6.2.2 Single Engine/Twin Engine ____

1.6.2.3 Day/Night ____

1.6.2.4 Special Operations ____ 1.6.2.5 Other ____

2.0 SUBSTANTIATING INFORMATION

2.1 US governmental Data & Documentation

2.1.1 FAA Advisory Circular 120-51A - Crew Resource Management Training

2.1.2 FAA Advisory Circular 120-35B - Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation

2.1.3 FAA Advisory Circular 120-54 - Advanced Qualification Program

2.1.4 DOT/FAA/RD-92/26 - Crew Resource Management: An Introductory Handbook

2.1.5 NASA - Cockpit Resource Management Training: Proceedings of a NASA/MAC Workshop, (NASA CP 2455), May 6-8. 1982.

2.1.6 NASA/ASRS - "Emergency Medical Service Helicopter Incidents Reported to the Aviation Safety Reporting System," Connell, L. & Reynard, W. (1993). Proceedings of the Seventh International Symposium on Aviation Psychology, pp. 1001-8.

2.1.7 NASA/ASRS - "Common Pitfalls Leading to Incidents in the Emergency Medical Helicopter Operation." Connell, L. (1993). Aerospace Medical Association, 64th Annual Scientific Meeting. Published abstract in Aviation, Space, and Environmental Medicine.

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2.1.9 DOT/FAA/PM - 86/42 - Aeronautical Decision Making for Commercial Pilots. Jensen, R. & Adrion, J. (1988).

2.1.10 DOT/FAA/DS - 88/5 - Aeronautical Decision Making for Air Ambulance Helicopter Pilots: Learning From Past Mistakes. Adams, R. & Thompson, J. (1988).

2.1.11 DOT/FAA/DS - 88/6 - Aeronautical Decision Making for Air Ambulance Helicopter Pilots: Situational Awareness Exercises. Adams, R. & Thompson, J. (1988).

Military Resources

2.2 Industry Data

Joel Harris, FSI, 1994 EMS Study, Aeromed Journal, Trade Journals

121 Operators, 135 Operators

2.3 Surveys

2.4 Reasonable and Prudent Practices _

2.5 OTHER

2.5.1 Cockpit Resource Management (1993). Wiener, E., Kanki, B., & Helmreich, R. Academic Press.

3.0 REGULATORY COMPLIANCE

3.1 FAR 135.321- Applicability and terms used, 323-Training program: General; 329-Crewmember training requirements

4.0 IMPLEMENTATION

4.1 Managerial