CHC Helicopter Corporation’s Integrated Safety Management System (SMS)

Sylvain Allard, President & CEO
CHC Helicopter Corporation
Company Overview
Company Overview

CHC Helicopter is the World Leader

- CHC is the largest commercial helicopter operator in the world
- Strategically located in 30 countries
- World’s largest and most modern fleet of medium and heavy helicopters
- CHC focuses on:
  - Offshore oil and gas production (60%) and exploration (12%)
  - Search and rescue (SAR) / emergency medical services (EMS)
  - Repair and overhaul for civilian and military helicopter fleets
- Superior operating and financial performance relative to the industry

Note: All dollar amounts stated in Canadian $ unless otherwise noted.
Company Overview

Revenue Breakdown (C$ in millions)

**Revenue By Segment**
- International 21.7%
- European 51.0%
- Repair & Overhaul (a) 9.6%
- Schreiner 17.7%

**Revenue By Industry**
- Oil and Gas Production 59.9%
- Total Oil & Gas 72%
- Oil and Gas Exploration 12.1%
- EMS / SAR 8.5%
- Repair & Overhaul 9.9%
- Other 9.6% (d)

Total Revenue: C$900 million
Historical Timeline

*CHC has become the world’s leading helicopter operator via several strategic acquisitions while divesting selective non-core assets to strengthen its operational profile*

- **Acquisition of Canadian companies:**
  - Toronto, Ranger, Okanagan, Viking
  - BIH Acquisition:
    - Expansion into Europe and diversification of customer base
  - IPO
  - HSG Acquisition:
    - Firmly established CHC as a leader in Europe and International regions
  - Schreiner Acquisition:
    - Strengthens European operations and adds additional international presence, with no significant overlap
  - Divested repair and overhaul segment via spin-off
  - Divested Canadian onshore operations

- **Divestments:**
  - Divested Canadian onshore operations, and other non-core assets
  - Divested U.K. non-oil and gas related operations, and other non-core assets
  - Divested Canadian offshore operations
  - Divested U.K. non-oil and gas related operations, and other non-core assets
  - Divested Schreiner Canada & Samco
  - Multifabs Survival Acquisition:
    - With Whirlybirds forms new unit: CHC Survival Services UK.
  - Aero Turbine Support Acquisition:
    - North American engine overhaul shop

- **Timeline Events:**
  - 1986-1989
  - 1993-1994
  - June 1998
  - August 1999
  - June 2000
  - October 2000
  - February 2004
  - August 2004
  - September 2004
  - February 2005

- **Build Sikorsky Component Shop**
- **Launch Heli-One**
- **Divested Schreiner Canada & Samco**
New Organizational Structure

Consistency
- Consistent Safety Management System
- Consistent customer interface
- Consistent image and branding Worldwide
- Consistent HR management to improve employee satisfaction

Efficiency
- Decentralized Business Units accountability
- Increased focus on service - external & internal
- Improved utilization of internal capabilities
- Improved overall management efficiency

30 Countries, 8 Seas, 3 Oceans

ONE BRIDGE THAT SPANS THEM ALL
Global Presence

Global Reach with 14 regional Business Units

European Operations
- Includes oil and gas, search and rescue and emergency medical services
- 72 aircraft (53 heavy and 19 medium)
- 7 Business Units

Heli-One
- Provides “Nose-to-Tail” support worldwide
- Includes all Repair & Overhaul activities in Vancouver and Stavanger
- Central parts distribution from Amsterdam
- Complete Fleet management and Leasing

Global Operations
- Includes oil and gas, search and rescue and emergency medical services
- 135 aircraft (21 heavy, 88 medium, 12 light & 14 fixed-wing)
- 7 Business Units

Restructuring from 7 divisional head offices to 1 Headquarters and 1 European Office
New Headquarters in Vancouver
Integrated Safety Management System (SMS)
Impetus for Risk Management

Worldwide Accident Rate, Hull-loss Accidents and/or Fatal Accidents Large Commercial Jets (>60,000 pounds, non-CIS) 1959–2001*

- Post WWII - QC/QA in Manufacturing
- Systematic Pilot Training
- Introduction of Jets
- Systems view
- Introduction of CRM
- Plateau

*Data through Sept. 15, 2001
CIS = Commonwealth of Independent States
60,000 pounds = 27,000 kilograms (maximum gross weight)

Source: Boeing Commercial Airplanes
Focusing on the Greatest Risk

Worldwide Accident Rate, Hull-loss Accidents and/or Fatal Accidents Large Commercial Jets
(>60,000 pounds, non-CIS) 1959–2001*

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Source: Boeing Commercial Airplanes
Safety Philosophy:

1) All accidents are preventable
2) Management is – “the art of Control”
3) Accidents are examples of a loss of Control

Therefore

4) Accidents are a “failure of management!”

5) Management must do what is “reasonably practicable” to stop accidents.
SMS Balances your Business Drivers

(Helps Executives set Healthy, Informed Business Goals)

Safety Management vs. Business Management

**BUSINESS**: Mission – Vision – Strategy
Implement – Observe – Analyze – Improve

**SMS**: Goal – Targets – Strategy
Implement – Observe – Analyze – Improve

Leadership

Functional
Risk Management - Systems Approach

Purpose (Goal) of the SMS:

• To create and maintain a safe and healthy working environment for all CHC colleagues, passengers and visitors (SMS)

• To produce fully airworthy aircraft, in a safe working environment, that are subsequently operated safely (QMS)

• To ensure that all work activities undertaken are progressed in a safe and environmentally responsible manner as per CHC’s safety policy (OHS)
**12 Common Components of an SMS**

1) Leadership & Accountability (Policy & Terms of Ref.)
2) Risk Assessment and Hazard Management
3) Training & Competency
4) Working with Contractors and Vendors
5) Facility Maintenance, Inspection and Management
6) Operations (SOP) and Safe Systems of Work
7) Management of Change
8) Information and Document Control
9) Crisis and Emergency Management
10) Incident Analysis and Accident Prevention
11) Assessment, Audits, Assurance and Improvement
12) Performance Measures (KPI’s) and Continuous Improvement
Dr. Reason’s, Dr. Wiggman & Dr. Shappe

Human Factors Analysis and Classification System (HFACS)

An SMS brings greater focus on improving performance at all levels.

Dr. Reason’s Model:
“An accident is indicative of failures at all levels!”

The industry focuses on taking action at this level.

Organizational Influences

Latent Failures

Unsafe Supervision

Latent Failures

Preconditions For Unsafe Acts

Latent Failures

Unsafe Acts

Failed or Absent Defenses

Dr. Reason’s Model:
“An accident is indicative of failures at all levels!”
Prerequisites for an Effective SMS

1. A comprehensive corporate approach to safety
   (Policy Statement which leads to an Integrated SMS Policy Manual. Compliance is a “condition of employment” for every employee at every level)

2. An effective organisation for delivering safety
   (Clear accountability in Safety & Quality, Operations & Resources, Technical Services, Business Development, Training, Support, Finance, etc.)

3. Systems to achieve safety oversight
   (Standard Operating Proc., Safe Systems of Work, Quality Audits, Occurrence Reporting, & Investigation, FDM, Vibration Monitoring, etc.)
Prerequisites for an Effective SMS

1. Corporate Approach to Safety
2. Effective Organization for Safety
3. Systems to Achieve Safety Oversight
When an SMS is implemented at a corporate level, the same standard in “risk management” applies in each department, and at every level!
Corporate Approach to SMS
Prerequisite #1

Health, Safety, Environment and Quality Policy

01 May 2005

The management of CHC Helicopter Corporation is committed to providing safe and healthy working conditions and attitudes within the Company, with the ultimate goal of providing an accident-free workplace while meeting all relevant legal and regulatory requirements. CHC will continuously review and improve the effectiveness of its management systems. CHC will further continuously monitor and improve safety, health, environment and quality objectives to ensure legislative compliance and customer satisfaction are maintained. In this and, the Company’s culture is founded on the principles of continuous training, vigilance, prevention and open communication.

Each subsidiary, division and Joint Venture Partnership of CHC is committed to:

- the continuous pursuit of the goal of no harm to people, the environment and property;
- promoting a culture of open sharing of all safety issues;
- promoting and supporting safety training and safety awareness programs;
- protecting the environment and conserving energy;
- establishing effective safety, environment and health management policies and systems;
- providing a safe working environment;
- conducting regular audits of safety policies, procedures, practices and arrangements;
- sharing best practice methods across the industry and monitoring industry activity to ensure best safety practices are incorporated into CHC;
- demonstrating its commitment and stakeholders are given commitment to continuous improvement;
- providing the necessary resources to support this policy.

Risk inherent in all operations must be managed to prevent injuries, illness or death. All employees are encouraged to maintain a safe work environment through adherence to approved procedures, training, and, perhaps most importantly, communications. They shall familiarise themselves and comply with relevant safety, health and environment policies and regulations, and work in a manner that conforms to them, as well as to client and other parties.

Gyton Allard, President and CEO
CHC Helicopter Corporation
Corporate Approach to SMS

Prerequisite #1

- Integrated SMS Exposition
  or
  Safety & Quality Management Policy Manual

- SMS Guidance Material
  or
  SMS Procedures Manual

- Template Safety Case
  Which is;
  A comprehensive “Safety Audit”
  or “Case Study”
Corporate Approach to SMS
Prerequisite #1

Integrated Safety Management System Exposition

SMS Compliance Procedures

Generic Safety Case

JAR OPS 1
OPS

JAR OPS 3
OPS

Part 145
OMME

JAR FCL 2
JAR 145

HESS Manual

Emergency Response Manual

Maintenance Procedures

Standard Operating Procedures

Training Procedures

Financial Procedures

HESS Procedures

Support Procedures

New for CHC

Complies with:
1) CAP 712, and
2) ISO 9001, and
3) ISO 14001, and
4) Risk Mgmt Stds.
5) Customer Standards, &
6) TC Flight 2005

Corporate Approach to SMS
Prerequisite #1
Creating an effective organization means:
1) Awareness Training for Managers
2) Mechanism to ensure Adherence to Standards
3) Hazard Identification & Mgmt Process
4) S&Q Independence from Operations
5) Reporting Mechanism with Feedback loops
6) Mechanism for commercial & safety interface
Corporate Approach to SMS
Prerequisite #3

Old way - “Quality Assurance”
Corporate Approach to SMS
Prerequisite #3

Improvement – “Quality Management” System

- Customer
- Requirements
- Customer

- Management responsibility
- Resource management
- Measurement, analysis and improvement
- Product realization

Input
Result

Value-adding activities
Information flow
Corporate Approach to SMS
Prerequisite #3

- A company-wide system for recording Occurrences, Non-Conformance, Customer Complaints, etc.

- A planned and comprehensive safety audit review system, including an internal independent system review.

- A published system for internal safety investigations, the remedial action tracking and safety communication.

- Systems for effective use of safety data for performance analysis and for monitoring organisational change as part of the risk management process.

- Process of monitoring line performance and compliance.

- System for Safety Promotion, sharing of “Best Practices”.
Corporate Approach to SMS
Prerequisite #3

Safety Quality Integrated Database (SQID)

Options
Welcome Greg Wyght
Your current access level is: Group Custodian
Your last visit was: 23-2-2006 11:46

Active Users: 1

CHC
“SQID”

Time you opened this page: 11:14:58 PM
Session will expire at: 11:54:58 PM

Report statistics
New Reports: 0 Open reports: 36

Messages
Selected From
Ruud Hellingman
Ruud Hellingman
Bob

Subject
CAR 228 (JAR-OPS Audit 33) is closed
Changed Car (JAR-OPS Audit ID = 33) CAR ld = 228)
CAR ID 225 att. to Audit report

Received
15-12-2004
15-12-2004
15-12-2004

MsgType
PRIVATE
PRIVATE
PRIVATE
Corporate Approach to SMS
Prerequisite #3

Safety Statistics Report
For Schremer Airways Cameroon/Tchad
Start 11-2004 - End 1-2005

SECTION A - AIRCRAFT

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<th>Aircraft Type</th>
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SECTION B - QUALITY OPERATIONS

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<th>Audit Type</th>
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<td>JAR 145</td>
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<td>JAR OPS</td>
<td>Safety</td>
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SECTION C - AIRCRAFT, MAINTENANCE AND AIR SAFETY RELATED REPORTS

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<th>Report Type</th>
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<td>Non Conformance</td>
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<td>Occurrence</td>
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SECTION D - SAFETY

D1 - Relative performance indicators
- Monthly average no. of employees on site - Total
- 24.00
- Monthly average no. of employees on site - Locales
- 24.00
- (All in this period)
What has the SMS Done for CHC?
The ICAO definition of an “Incident” represented in this chart include anything from Engine failures to Near Misses, to minor Bird Strikes.

Continuous Monitoring, and Annual Trend Analysis For all Internal Occurrences.
254 Incidents in 2004 (up 10% from 2003)
(5 “Incidents” as defined by TC)

55% - Technical
30% - Miscellaneous
8% - Maintenance
7% - Crew

23% - Navigation System Failures
40% - found by maintenance
9% - Engine Monitoring
9% - Electric
CHC Safety Performance
(Audit, Investigation & Trend Analysis)

254 Incidents in 2004 (up 10% from 2003)
(5 “Incidents” as defined by TC)

55% - Technical
30% - Miscellaneous
8% - Maintenance
7% - Crew

25% - Ground support induced
Manifest/Weigh/Cargo/Reported Weather Errors
CHC Safety Performance
(Audit, Investigation & Trend Analysis)

254 Incidents in 2004 (up 10% from 2003)
(5 “Incidents” as defined by TC)

55% - Technical
30% - Miscellaneous
8%  - Maintenance
7%  - Crew

68% - Procedure not followed/completed

Internal Education / Training
CHC Safety Performance
(Audit, Investigation & Trend Analysis)

254 Incidents in 2004 (up 10% from 2003)
(5 “Incidents” as defined by TC)

55%  - Technical
30%  - Miscellaneous
8%   - Maintenance
7%   - Crew
     _________
3%   - Human Factors related (CFIT)
“Each Department’s Key Performance Indicators …must be SMART.”

Specific
Measurable
Attainable
Results Oriented
Timely
# Holding Management Accountable

(Their Departmental KPI’s)

<table>
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<tr>
<th>Department</th>
<th>KPI</th>
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<tr>
<td>Executive Committee</td>
<td>1) Increase # Reported Occurrences 10% per year</td>
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<tr>
<td></td>
<td>2) Reduce Occurrence Severity</td>
</tr>
<tr>
<td></td>
<td>3) Balanced with Profitability</td>
</tr>
<tr>
<td>Operations Department</td>
<td>1) On Time Departures</td>
</tr>
<tr>
<td></td>
<td>2) Occurrence Severity Reduced</td>
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<tr>
<td>Technical Services Department</td>
<td>1) Unserviceable Days</td>
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<tr>
<td></td>
<td>2) Non-Conformances Closed</td>
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<tr>
<td>Business Development Department</td>
<td>1) Contract Win Ratio</td>
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<tr>
<td></td>
<td>2) Budgeted Cost Maintained</td>
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<tr>
<td>Human Resources Department</td>
<td>1) Competency Reviews</td>
</tr>
<tr>
<td>Safety &amp; Quality Department</td>
<td>1) Strategic Safety Objectives</td>
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</table>
How does this Compare to the Industry?
Review of Industry Specific Accident Causal Factors

OGP Offshore Accidents by Year

2003 Offshore
- Operators: 134
- Fleet: 1099
- SE: 443
- LT: 107
- MT: 391
- HT: 158
- Pax: 9 Mil
- Hours: 925,000
- Flights: 2.8 Mil

![Image of offshore helicopter](image-url)
Statistics show:

35 Offshore Helicopter Accidents in 2003
(up from 25 accidents in 2002, and 29 accidents in 2001)

2003 Accident Rate (Offshore) went up to 3.51 / 100K

Causal Factors: #1 CFIT (Note: CFIT is #1 every year since 1997)
#2 is Pilot Procedure (Human Factors)

Rates/100K Hours
1999 – 2.05
2000 – 1.79
2001 – 1.19
2002 – 1.16
2003 – 3.51

5 Year Accident Rate Offshore
Gulf of M. – 2.30
Worldwide – 1.86
North Sea – 1.05
OGP Offshore Fatal Accident Causes 1995-2001
(32 Total with 115 fatalities)

- Pilot Procedure: 53%
- Technical: 25%
- Midair: 13%
- Unknown: 6%
- Pax Control/HLO: 3%
- Trng: 3%
Offshore Pilot Procedure Accidents 95-2001
(41 Total and 49% of all accidents)

- Obstacle Strike
- Helideck
- Tie-Down Proced.
- Loose Cargo
- CFITW
- Loss Control / Improper Proc
- Fuel Mgmt
- Sling Load

OGP (Industry) Statistics
Potential Mitigating Measures for ALL Offshore Accidents 95-2001

- Acft Equipment Fit 24%
- Perf Class 2 Options 5%
- Improve / enforce Stds 23%
- Dual Pilots 12%
- Pax Control & HLO 1%
- Training 35%

OGP (Industry) Statistics
1) Configuration Initiatives:

- **FDM** – CHC is committed to incorporate Flight Data Monitoring on all aircraft. SMS components of FDM (e.g., “Operations Error Management System” – OPEMS) is under development based on successes in MEMS (Maintenance Error Management).
- **EGPWS** – will be installed in aircraft in accordance with operational risk assessments.

2) Training Initiatives:

- **Simulator Training** – CHC has expanded its commitment to use Level D simulators for all aircraft types.
- **ALAR Kit** – Flight Safety Foundation’s “Approach and Landing Accident Reduction” Kit, will be used to raise pilot awareness about the highest risk segment of any flight.

3) Enforcement Initiatives:

- **Internal Auditors** - Maintain 20 Trained Internal Auditors (7 in 2003), with completed independence from Operations.
- **Independent FDM** - independent tool for the development and improvement of Training Procedures and SOP’s.
- **Safety & Quality** - Integration of these two related efforts into one Department providing representation from base level to Corporate Executive level.
Operational Benefit of an SMS

Accident Rate Comparison
Data taken from “Air Safety Online” and “1998-2001 OGP”
Current as of July 12, 2002

Acc. Per 100,000 hours flown

- All Helicopters: 7.90
- Twin Helicopters: 2.60
- Off-shore Operation: 1.27
- CHC: 0.47
- Average Major Carrier: 0.42
- Air Canada: 0.33
SMS Benefits All

Benefits for the:

CEO & President:  
(& Management)  

a) Gain confidence in your systems effectiveness  
b) Receive timely, quantitative input from front line  
c) “Staff buy-in” when they see results from their input  
d) Greater compliance due to more motivated staff  
e) Ensure minimal Losses!! (Human, Assets or Profits!)

Front line staff:  

a) Confidence that concerns are heard, and dealt with  
b) Job expectations are clear & fair (increase productivity)  
c) Pride in your work! (Part of a professional company)  
d) Safe Working Conditions (Enjoyable work environment)

Pax & Customers:  
(& Stakeholders)  

a) Assurance that risks are managed to ALARP  
b) Confidence that threats are addressed appropriately  
c) Confidence that their voice will receive attention
We Move The Industry
That Moves The World…