



# Line Activity Monitoring Program

An update on PHI's HFDM Program

*Heli-Expo IHST 2010 HFDM Workshop  
February 22, 2010*



# *Agenda*

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- Who is PHI?
- Who is LAMP?
- What is LAMP?
- What has LAMP done?
- What is LAMP doing?



# *PHI Today*

- In business over 60 years
- One of the world's largest helicopter fleets (over 230 aircraft)
- Over 10 million R/W flight hours
- Most experienced operational team in the industry
- Industry leader in safety management efforts
- Extensive world class maintenance facility (Part 145)
- Active in FAA & industry safety initiatives, including IHST





# PHI Today

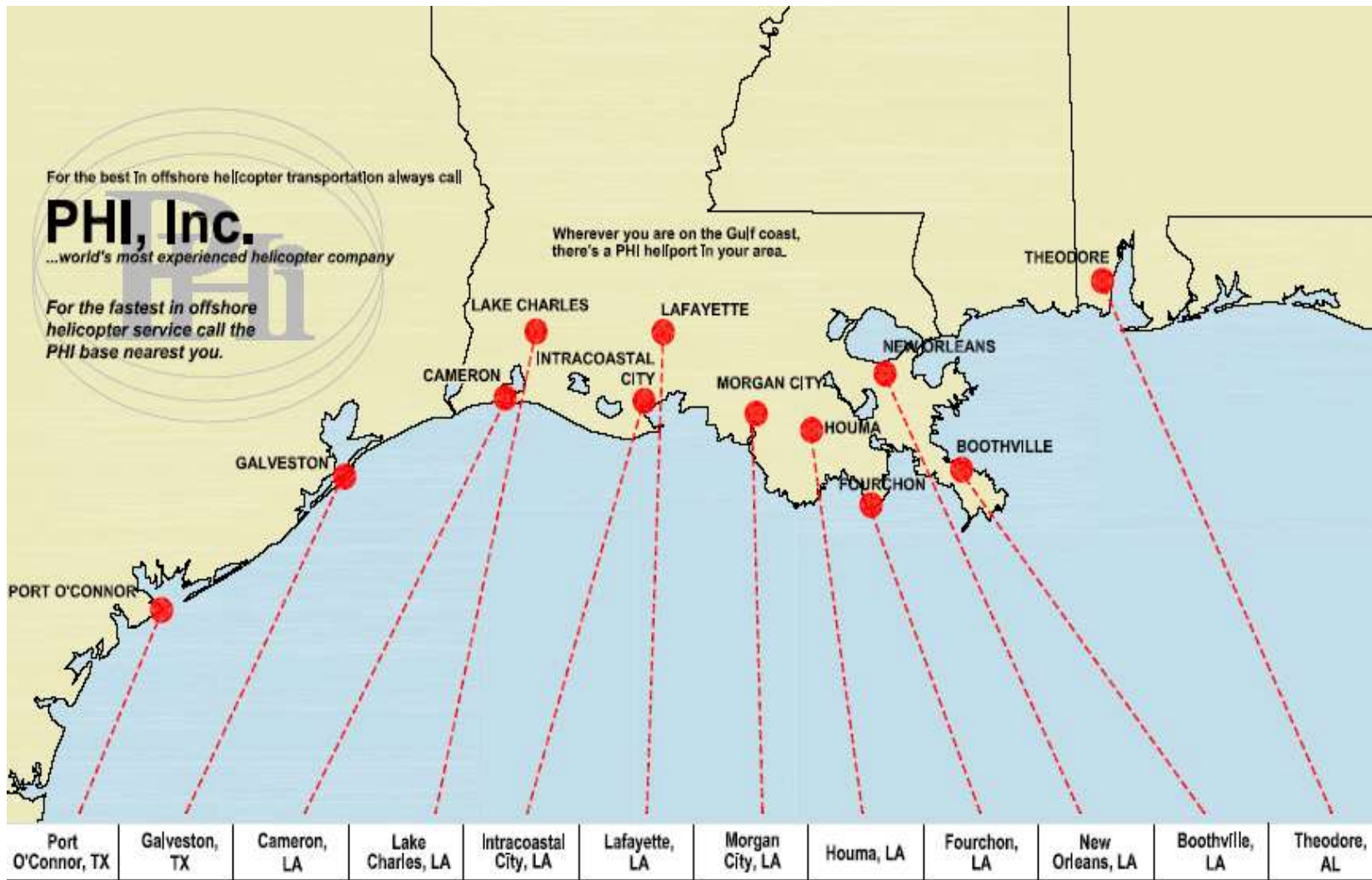


- Approximately 2,300 Employees
  - 650+ Pilots
  - 600+ Certified AMTs
- Average Pilot Tenure: 10.6 years
- Pilots Average 7,200 flight hours
- Average AMT Tenure: 15.9 years
- Average Pilot age: 48.5
- Average AMT age: 45.2



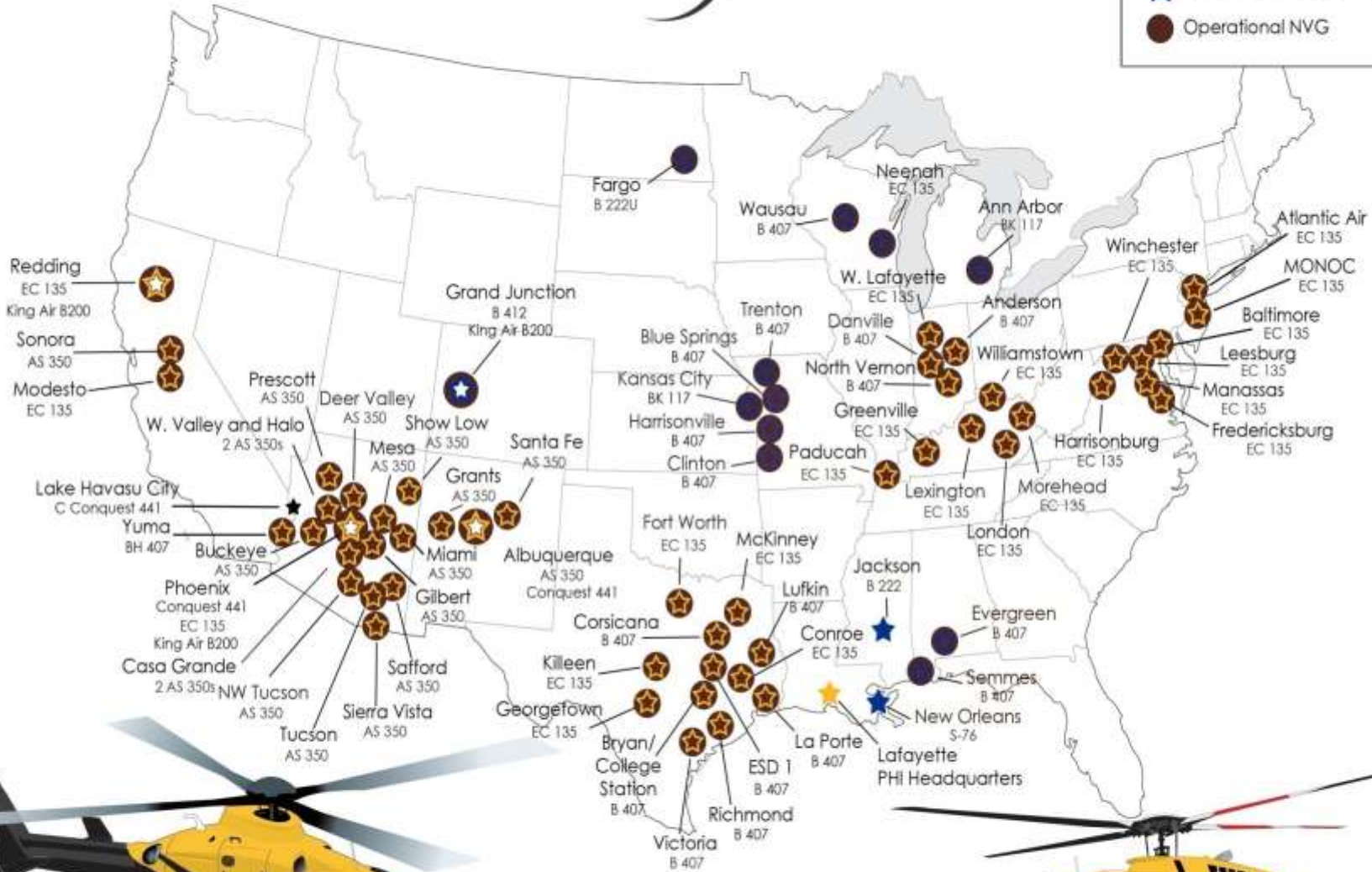


# Gulf of Mexico Base Locations





- Helicopter Base
- Fixed Wing Base
- Fixed Wing and Helicopter Base
- Traditional Air Medical Base
- Operational NVG



# PHI Air Medical Group 2009



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**LAMP**

# PHI's Safety Management System

... the company's formal systematic set of processes designed to manage aviation safety critical activities.

## - Safety Policy -

... States Safety and Management Personnel's Commitments, Responsibilities and Accountabilities

- Mission Statement
- Goals
- Corporate HSE Policy
- Individual Duties, Responsibilities & Authorities

## - Safety Assurance -

... Defines the processes used to monitor performance, manage change and maintain continuous improvement

- Employee Reporting & Feedback
- Flight Data Monitoring  
LAMP / ADMS
- Safety Observations
- Internal Audits  
QSC / Base Level
- Remedial Actions  
Safety Management Review Team (SMRT)

## - Safety Risk Management -

... Defines processes to Identify, Analyze, Assess and Control Hazards

- Hazard Register
- Standard Operating Procedures
- GMM / SMS Vol II
- Safety Analysis
- Assessment Matrix
- Risk Assessments

## - Safety Assurance

... Defines the processes used to monitor performance, manage change and maintain continuous improvement

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## - Safety Promotion -

... Promotes continual qualification and training and describes PHI's SMS processes and awareness procedures

- Training & Employee Qualifications
- Communications  
Safety Alerts / FDNs / MANS / NOTAMS
- Key Performance Indicators
- Re-Active / Pro-Active
- Just Culture

Vol. I  
SMS Program

Vol. II  
HSE Specific Policies & Procedures

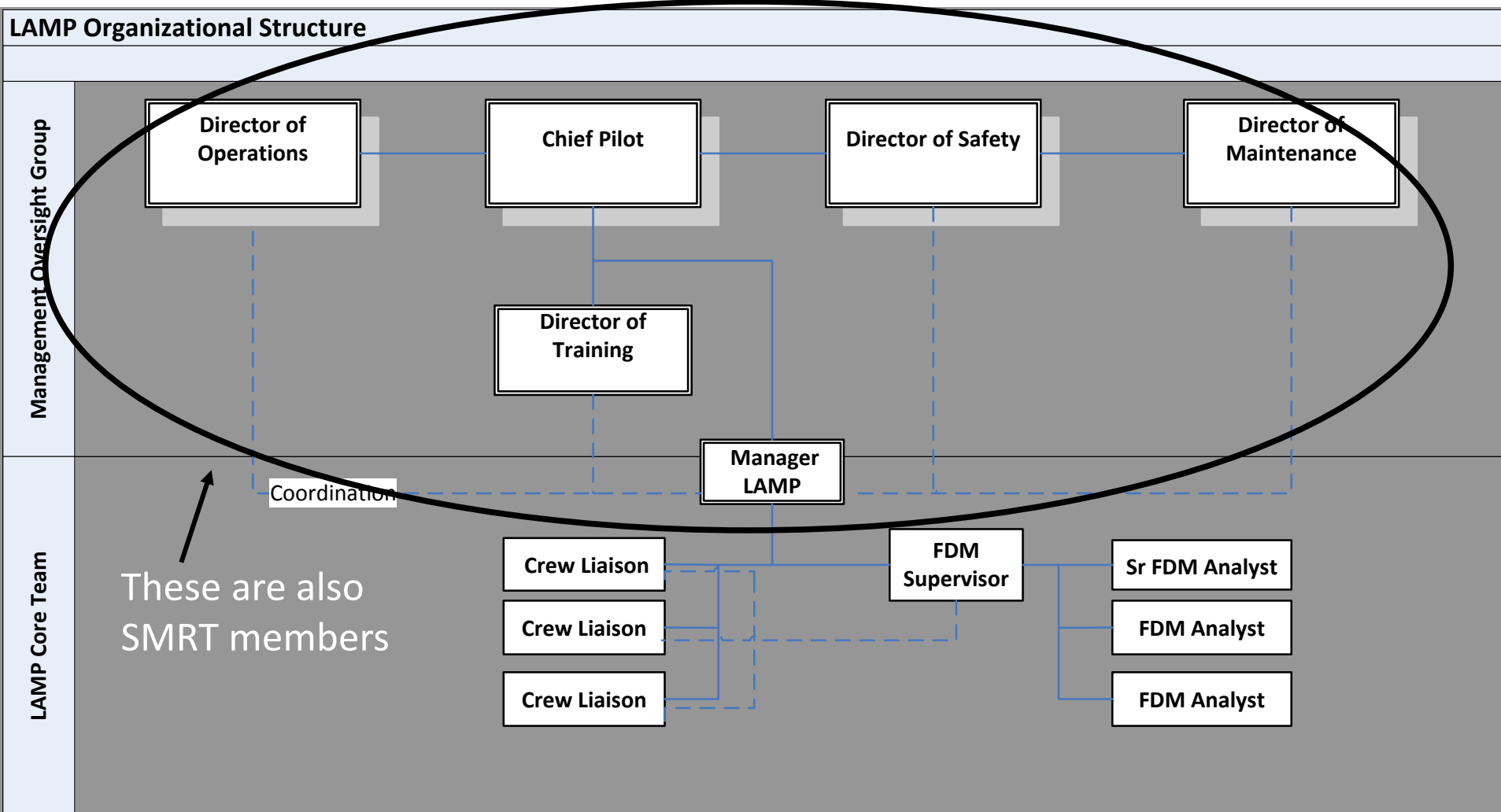
Vol. III  
HSE Specific Programs

Vol. IV  
Bow-Tie Assessments

Vol. V  
Base Specific Risk Mgmt

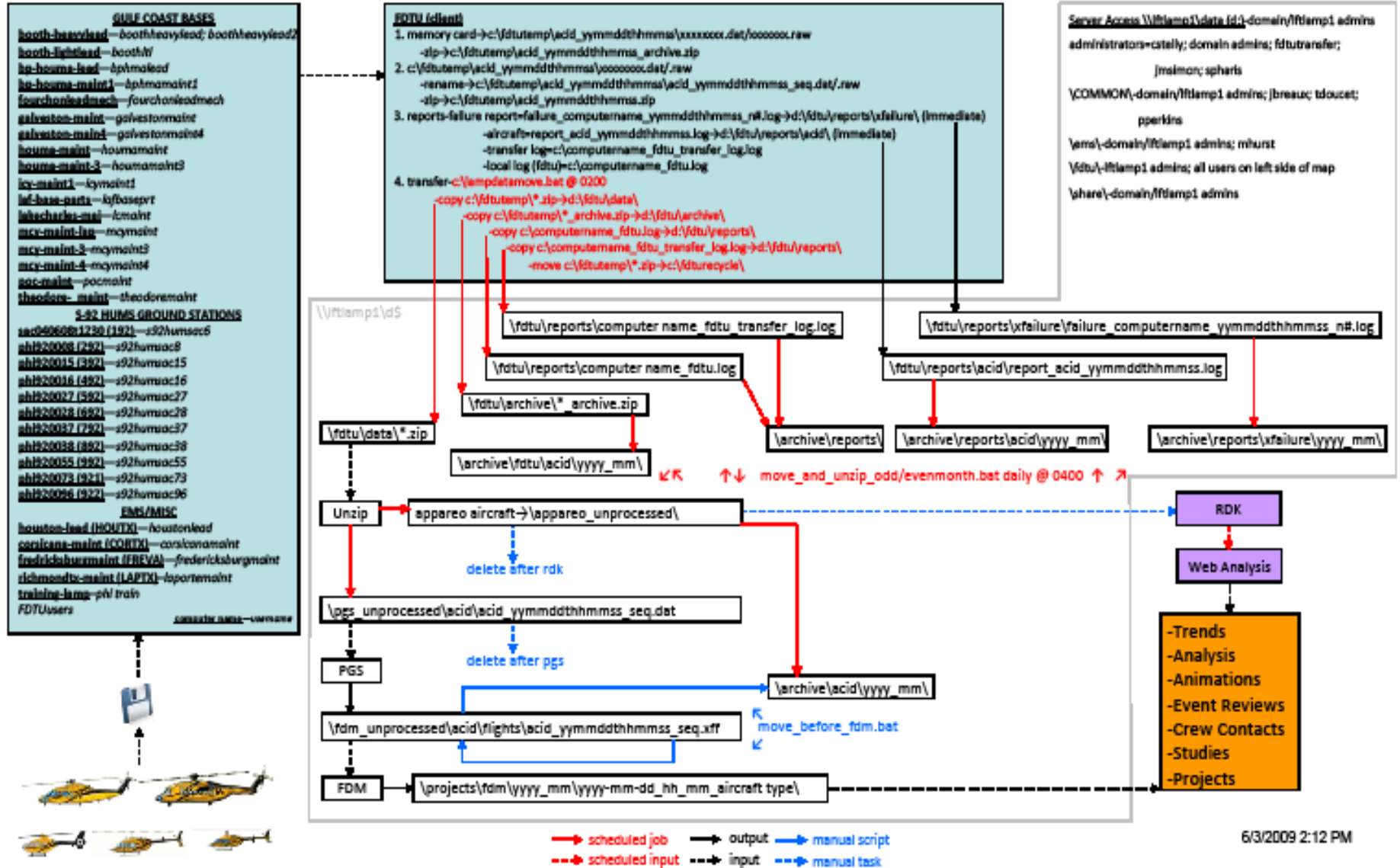


# LAMP Organization



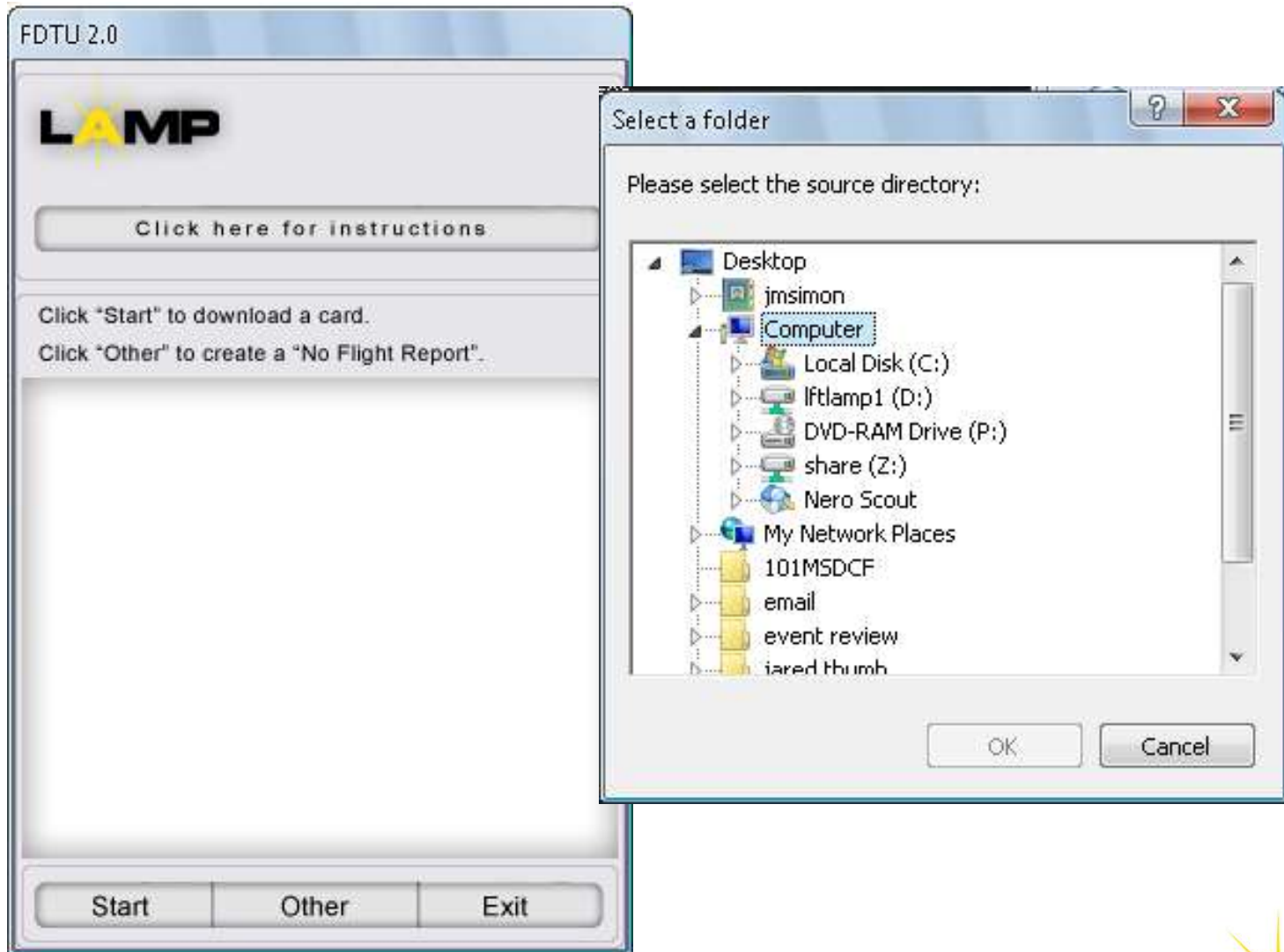


# Data Flow Processes





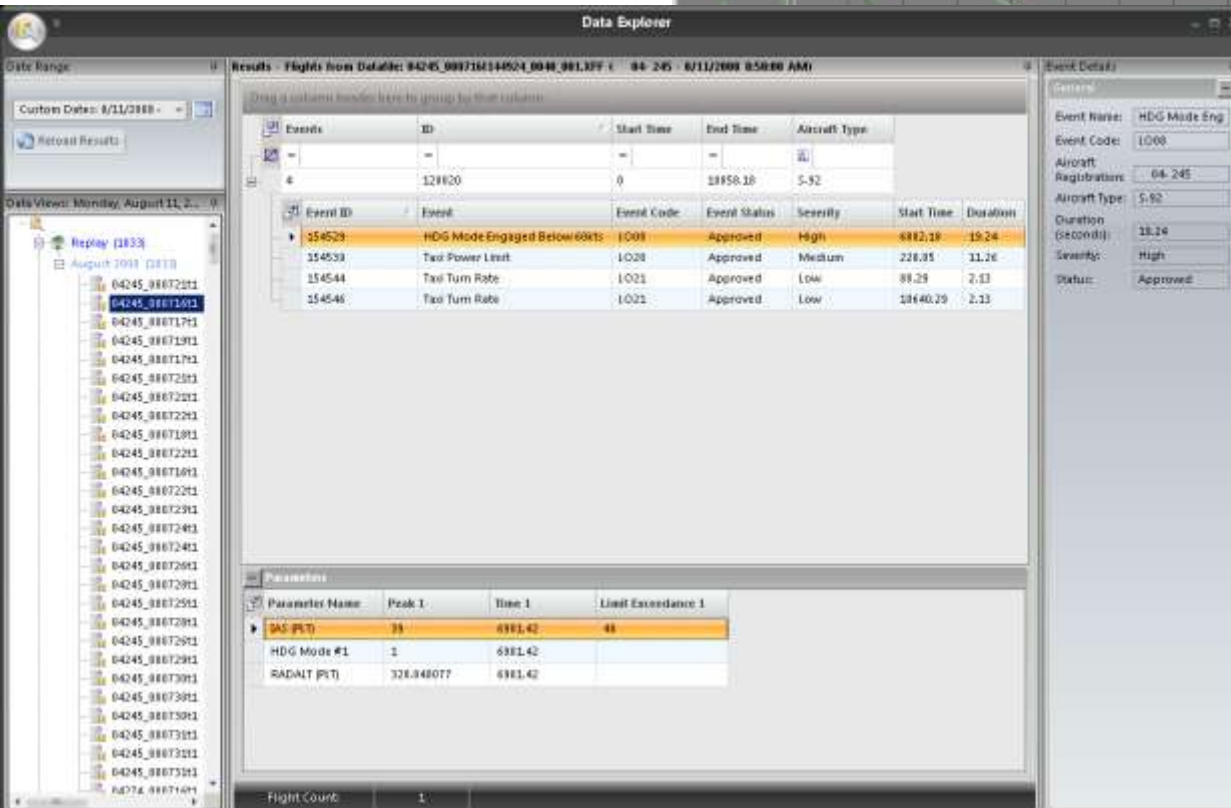
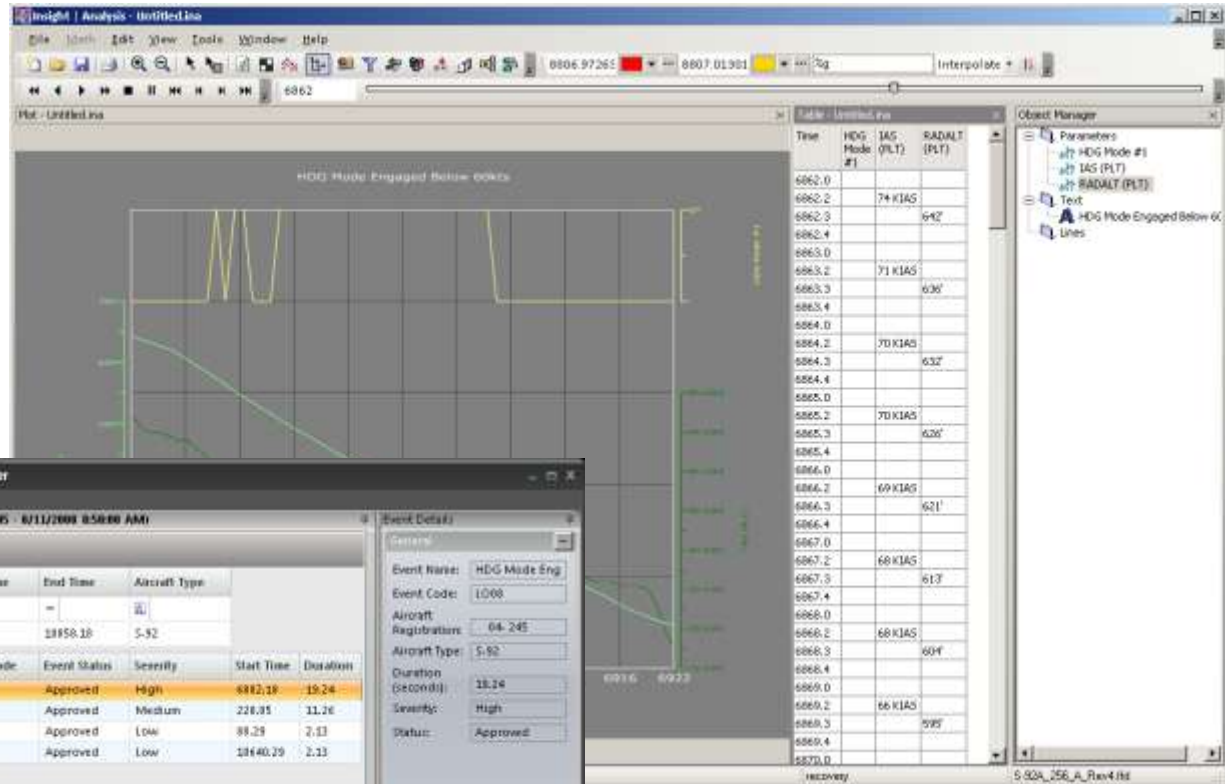
# *Flight Data Transfer Utility*





# Automatic Event Detection & Manual Analysis

Powered by:







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**Has LAMP *really* made a difference?  
You be the judge...**



# Closing the Loop

## PETROLEUM HELICOPTERS, INC.

### Post-Incident Review

Date of Meeting: 7-30-08

Date of Occurrence: 7-29-08

Aircraft: SK-92 A

N Number:

Employee:

Employee Number:  
Employee Number:

Location of Event: MC-822

#### Core Members:

Director of Operations	Carlin Craig
Chief Pilot	Mike Hurst
Director of Maintenance	Glen Cornett
Pilot Peer	Capt. Michael Edlebeck

#### Supporting members:

Director of Safety	Robert Bouillion
Flight Safety Manager	Terry Kaufman
HR Representative	Ed Gatza
Manager, Oil & Gas	Mickey Burton
Manager, BP	Pat Attaway

Report By: Robert Bouillion

Reason: Unstabilized Approach

### FACTUAL DATA CONCERNING SITUATION

#### PILOTS

The pilots involved were current and qualified for the operation being performed and were within flight and duty time limits.

#### AIRCRAFT

The aircraft was an SK-92A, certified for the operation under CFR 14, Part 135. At the time of the incident, there were no known aircraft discrepancies.

#### ENVIRONMENT

At time of departure from Houma, PHI EOC conditions for the route of flight were:

Houma – Amber for Air Mass Thunderstorms

Fourchon – Red for Thunderstorms Imminent Threat

Offshore lease areas for their route of flight, including Mississippi Canyon, were Amber due to Air Mass Thunderstorms. Pilot informed the PHI Comm. Center that they had circumnavigated some weather between Houma and Fourchon. Crew reports weather at destination as light rain, ceiling 450' with 3 miles visibility.

*PHI, Inc.*

## *Flight Operations Notice*

**Notice Number:** 08-17 **Page:** 1 of 2

**Subject:** Autopilot and Flight Director Policy, and Operations During Reduced Visibility

**Effective Date:** October 2, 2008

### FLIGHT DIRECTOR/AUTOPILOT COUPLING POLICY

**Applicability:** Flight Director equipped SK92, SK76C+/+, BH412 and BH230 aircraft with the Flight Director operational. This policy also includes Autopilot upper modes functions, as applicable, for the EC-135 aircraft.

**NOTE:** Except for Flight Training, coupled flight is required when operating:

1. At Night.
2. IFR in IMC conditions or when IMC conditions are anticipated.
3. During Reduced Visibility VFR. (Below 500' ceiling and/or 3 sm visibility)

**NOTE:** If coupled, 3 cue shall be used for all climbs, descents, cruise flight during Reduced Visibility VFR, VFR approaches and actual instrument approaches. 2 cue coupling may be used for cruise flight ONLY above 500' AGL. (SK92 & SK76C+/C++)

1. **TAKEOFF:** VFR and IFR - Flight Director Modes, if used, shall not be selected prior to reaching: Vy and 200' above the departure point surface.
2. **FLIGHT DIRECTOR/AUTOPILOT COUPLING SEQUENCE:**
  - Flight Director Modes, if used, shall be engaged after takeoff in the following sequence:
    - i. IAS Mode. (Between Vy and 100 KIAS.)
    - ii. Vertical Mode to include Alt-Pre as desired. (Between 500 fpm and 1000 fpm)
    - iii. NAV / HDG Mode.
3. **CLIMBING AND DESCENDING AIRSPEEDS:**
  - Climbs: Between Vy and 100 KIAS.
  - Descents: Between Vy and cruise airspeed not to exceed RFM Vns.

**NOTE:** Rate of descent limited to 500 fpm within 1000' from descent altitude.

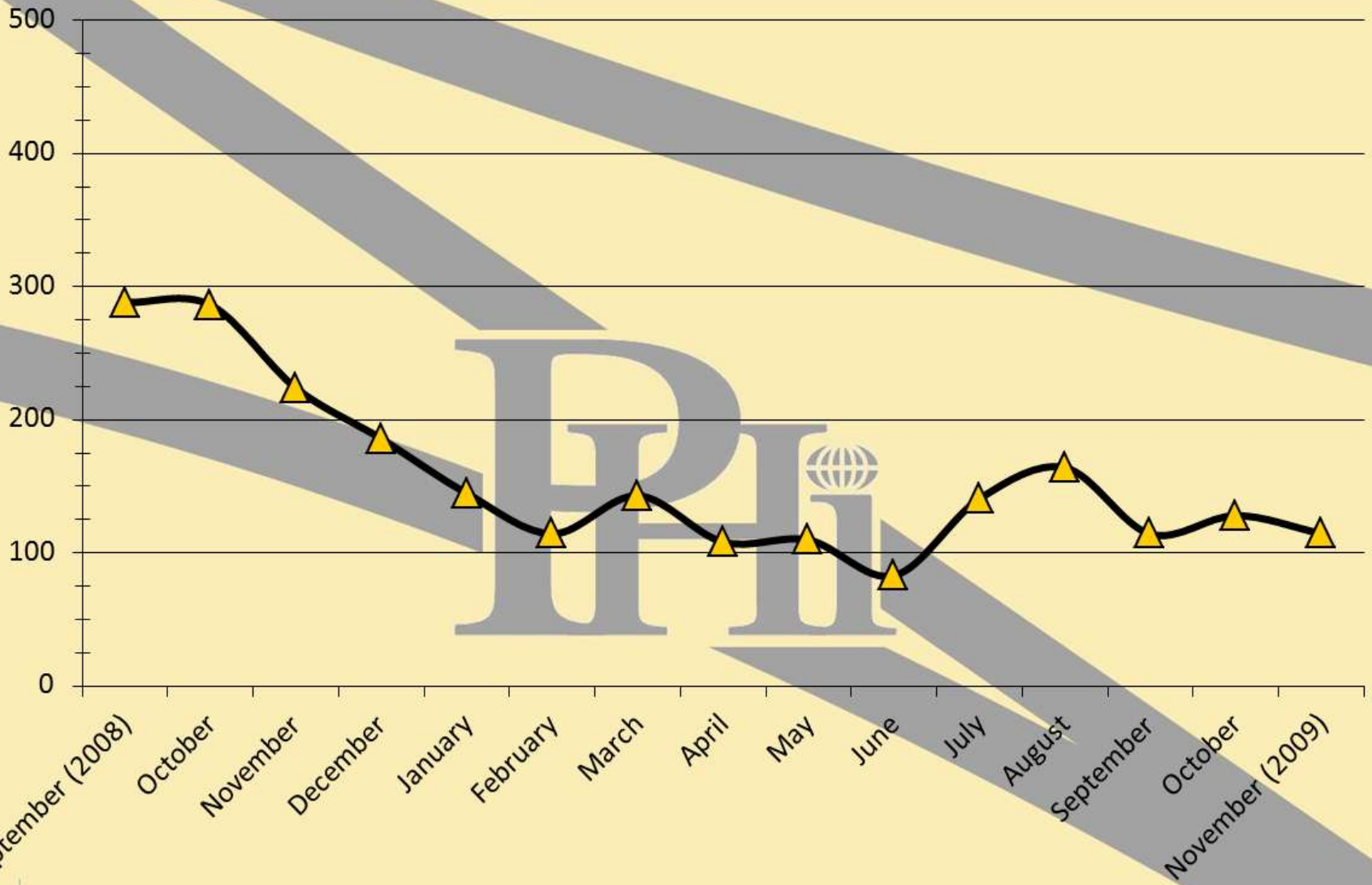
4. **LANDING:**
  - VFR: Start the Before Landing Check no later than 3sm from the landing point. The Before Landing Check must be completed, to include Flight Director Decouple, when:

**Issued By:** Chief Pilot

**Valid Period:** Until Incorporated in the GOM

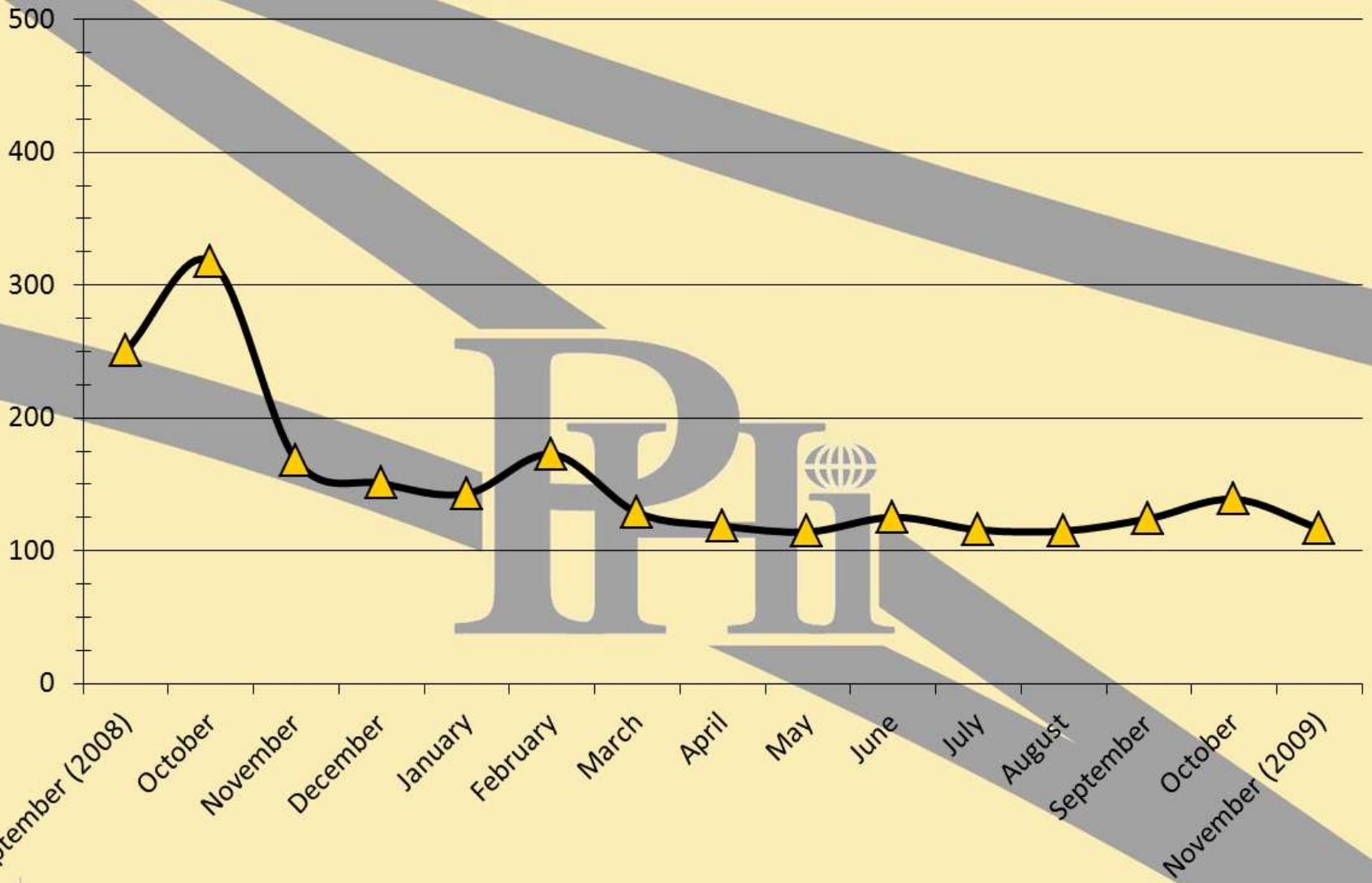
*A copy of this Operations Notice must be retained at each PHI Field Base, and be accessible for pilot reading. These notices may contain information that is mandatory in nature, but is limited in duration. Permanent changes will be issued in the form of a bulletin or revision to the appropriate manual. Pilots shall retain all notices. Flight Operations Notice's are to be kept in the General Operations Manual after the page indicated in the FON, until rescinded, superseded, or incorporated elsewhere.*

# FD Coupled Below Vy on Takeoff (S-92A)



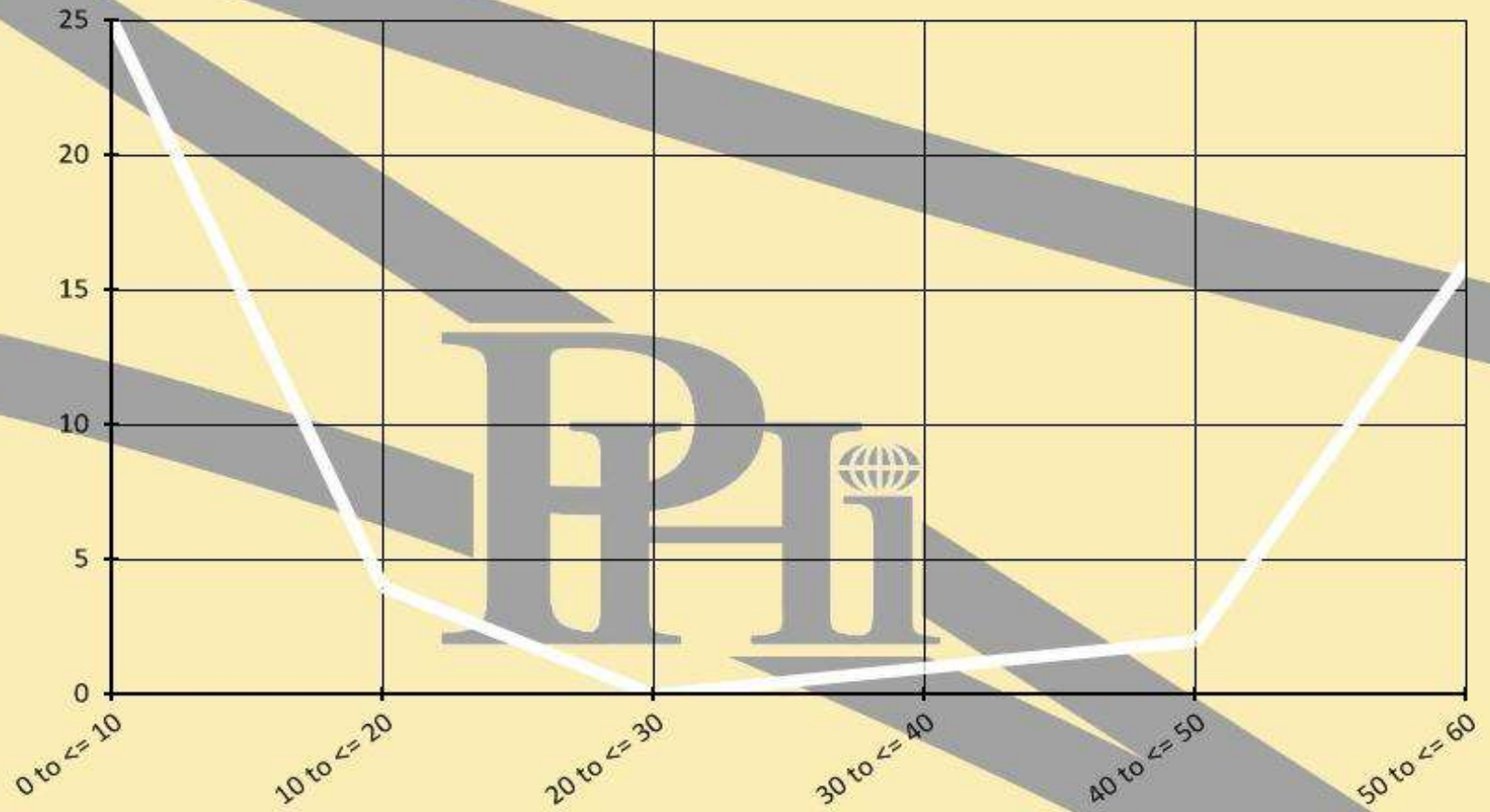
▲ Events per 1000 Flights

# FD 2 Cue During Climb/Descent (S-92A)



▲ Events per 1000 Flights

# 2008 FD Coupled Below RFM Limit (S-76)

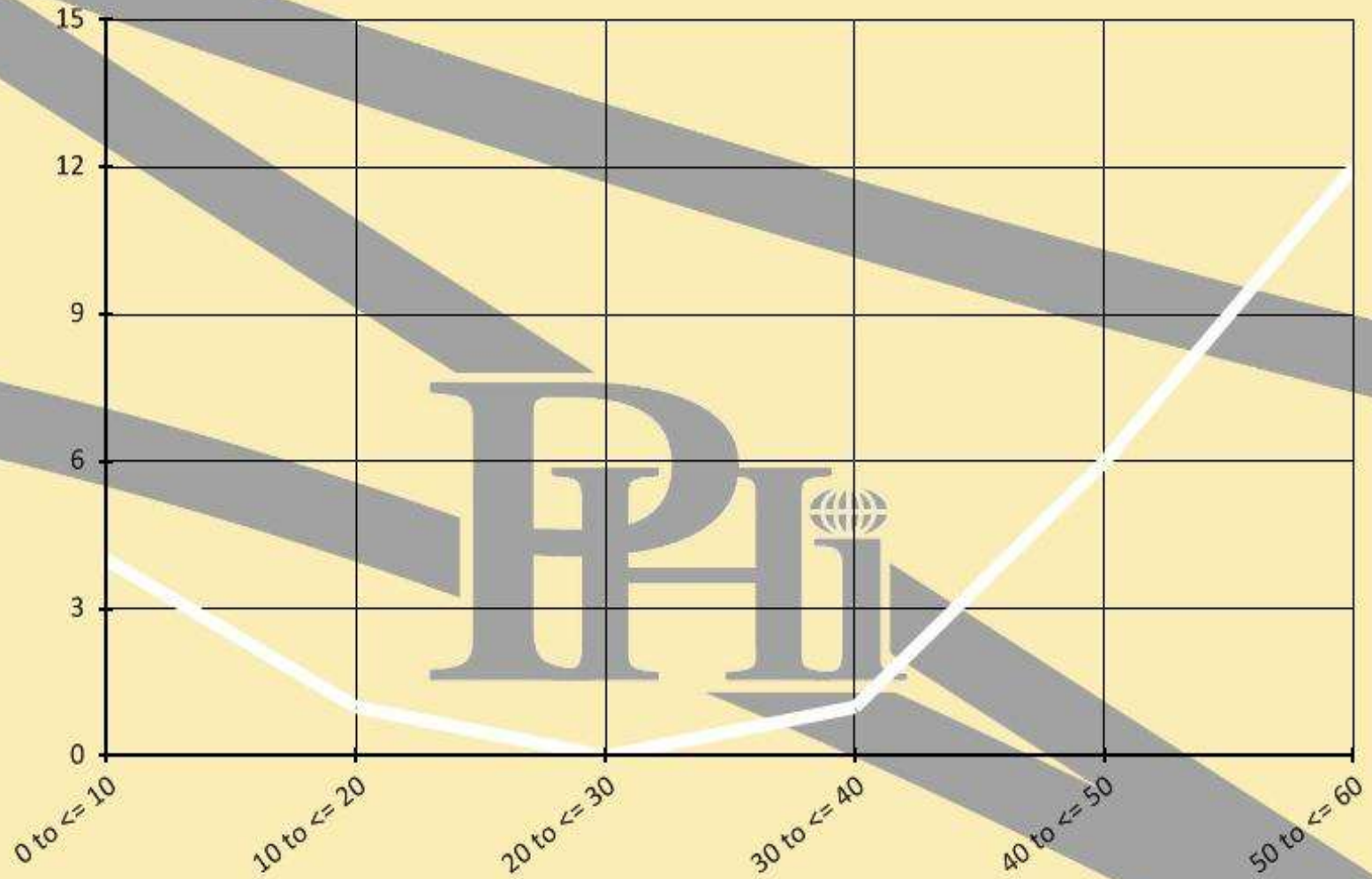


Number of Observations

Mean = 24.7917  
Std Dev = 23.1381



# 2009 FD Coupled Below RFM Limit (S-76)



Number of Observations

Mean = 41.6667  
Std Dev = 18.6339





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# What is LAMP doing?





# *OuterLink Flight Data System*

- Voice, Video, Data
  - Internal basic flight parameters
  - External data bus, digital and analog inputs
  - 6 audio channels
- QAR (16GB voice and video and 16GB data)
- Crash resistant, redundant memory
- DO-160 (Rotorcraft) compliant
- Lightweight and low-cost
- Embedded SMART application
  - Real time monitoring and alerts via SATCOM
- Final stages of EC-135 FAA STC with subsequent planned





# *Simulator Integration*

- Will allow us to evaluate emergency responses
  - Low rotor recovery response times
  - Power Management
- Will allow us to dial in scenarios for studies
  - Workload, weather, etc...
- Future capability for reverse playback
- Unconventional FDM
  - Scenario based v.s. Event based
- ????
- Working with FlightSafety to make data available



# *Advanced Data Mining*

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- Intend to partner with NASA if the opportunity becomes available
  - Preliminary discussions regarding helicopter specific data mining tools
  - Possible development site for helicopter adaptation of advanced tools
- More to come.....





# *Flightscape v3*

- Numerous enhancements
  - Full integration across the suite
  - Animation/analysis sync
  - Drag and drop capability
  - Standard parameter names across fleets
  - Increased accuracy in flight splitting
  - Google Earth export
  - Many more coming...







# *Community Involvement*

- Active in CHC's Global HFDM Committee
- Active in IHST HFDM Initiative
  - Contributed to HFDM Toolkit
- Active in NASA's GA-FDM Initiative
- Active in CHC Annual Safety & Quality Summit
- Participated in Eurocae WG-77 (ED-55)
- Interested in starting GOM "Infoshare" eventually
- Stay in contact with numerous vendors and "competitors"





# *Last Thoughts*

- Program Considerations
  - Personnel dimensions and capability
  - Company/crew support
  - Resources—time and money
  - Stovepipe operations
  - Lack of standardization
  - Lack of equipment (quickly changing)
  - **DATA, DATA, DATA**
    - GARBAGE IN=GARBAGE OUT
    - No such thing as plug and play





# Thank You Questions?

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