



## ***IFR/EMS Committee Agenda***

### ***Helicopter Association of Canada Annual Trade Show & Conference 2010***

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#### **IFR COMMITTEE HAC CONFERENCE 2010 MINUTES**

1. Review of previous minutes - moved and seconded by Walter Heneghan
2. Old business
3. **Review of IFR Committee Terms of Reference** - Bob Toews
4. **Introduction of HAC Committees Web site** - Bob Toews
5. **NVIS Workshop Preparation** - Stephane Demers & Bob Toews
  - a. *NRC NVG Research Presentation* - Dr. Greg Craig
    - i. *Flight research lab* - 5 primary members - work with various agencies including other regulators and military - tested various imaging systems over the years using a dark room and basic testing equipment - B206 main aircraft for doing NVG testing - includes external light meter - most recent project has been testing different image intensifier testing - Photonis vs ITT tubes - contrast, acuity, gain - Dr Craig may be able to provide official report on request once it is completed
    - ii. *Other projects* have included: comparison of panoramic vs regular NVG - also Thales TopOwl hyperstereo NVG - improves depth resolution but distorts normal stereo perception depth - RCMP: target detecting and tracking, interpretation of specs and performance - Adventure lights: IR & visible remote controlled LZ lighting determined to be visible from 7 km - OMNR: developed NVG SOPs & fire perimeter mapping, hotspot detection - Transport Canada: compatible and incompatible exterior lighting tests including what are effects of incompatible lighting in operations away from cultural lights, e.g. red light on the left side will

create strong light/shadow contrasts which may make it more difficult to see obstacles in the shadows

- iii. *Minimum performance spec* - TC asked for objective data for evaluating NVG performance that may still meet current spec but perform differently under different environmental conditions - very little difference between NVG performance in high contrast conditions- significant differences at low contrast
- iv. *Confined area and visibility trials* - NVG confined area: is 1.5 R large enough? - more drift under NVG - various exercises to test pilot precision - tail turns, bobups, and close hover all returned worse results under NVG - NVG Unlit Landings: very few instances where pilots cannot land safely at unlighted LZs with NVG under test conditions - NVG Visibility Perception: increases likelihood of flying into lower visibility - aided visibility different in precipitation, fog, and cloud - A/C mounted test visibility sensors to provide cross check for pilots - also trials of external photometer to measure ambient light levels - ratings of visual textures and contrast - Obstruction lighting: increased use of LEDs decrease NVG visibility - red LEDs have narrow bandwidth - white LED in red housing is more visible - red LED are not visible enough
- v. *Maintenance*: working with Gladestone Aerospace - lack of manufacturer recommendations - RTCA DO-275 includes maintenance recommendations but TC does not specify a maintenance interval and checking standard - defined by calendar inspections currently - hours of use might be more appropriate - periodic re-inspection of aircraft lighting - filters may become damaged - LED lights output deteriorates over time
- vi. *Other information*: Australians are about to release NVG SOPs

b. NVG Workshop agenda and expectations

- i. *Industry/TC session planned for Wednesday* - discuss reasons for use of NVG, benefits, limitations - TC wants to hear concept of operations from operators - take a look at other jurisdictions and what they are doing - where do we fit in Canadian ops - conclude with next steps and outcomes
- ii. *Anticipated Workshop Outcome* - consensus to adopt current NVG CBAC - applicability to 600 ops as well as 700 - incorpo-

rate utility operations - national exemption - aerodrome standards

iii. Canadian Helicopters (CHL) - wants to make sure NVG standards are not overly restrictive - esp pilot qualifications and currency requirements - wish to offer Nvg training at Canadian's school - no immediate plans to introduce NVG into operations - unique opportunity to collaborate and work with partners to create a new standard or practice

iv. Helijet - no immediate plans to introduce NVG into Ops

**ACTION:** Hold NVG Regulatory Workshop on April 14 in Quebed City. Create follow-up action plan.

6. **Heliports & Helicopter Performance Classification** - Prep for Monday round table & Monday discussion - Rob Freeman

- a. TC Briefing Rob Freeman - ICAO mandate to improve public safety through application of performance criteria to helicopter operations (see Rob's presentation) - PC1 no loss of control or obstacle clearance during entire flight - PC2 includes a period of exposure to 625 m of FATO - twins not capable of maintaining flight under all conditions - performance class refers to how the aircraft is operated - PC1 requires Cat A performance capability - accountability for clearing obstacles in the departure and arrival area - safety of air traffic activities must be assured by air and aerodrome operators - heliport survey and classification determines the operating classification type required
- b. Interpretation (RF & BT) - TC Aerodromes have correctly interpreted performance classification criteria and applied them to Canadian operations according to Rob - as an Association the HAC does not believe full consultation occurred - discretionary application of emergency landing area definition by field inspectors has changed - we may also be affected by other changes to ICAO or JAROPs definitions - e.g. congested and hostile areas - lack of definition for terms such as built up area causes problems - CBA will want to comply with ICAO Annex 6 criteria - TC differences will be supported by industry negotiated alleviations
- c. Application of criteria - interim guidance can be issued in lieu of full regulatory action

- d. Possible TC & industry response - Arthur Allan (TC) will take this to the regional directors to ensure consistency in application of existing standards - national meeting of directors will address prioritization of performance classification project - possible striking of working group - HAC may present a request for alleviation or performance compliance to operate to H1 heliports and request the creation of a performance classification working group - define short and long term request - consider impact on other industry segments
- e. Heliport airspace protection - Rob F suggests HAC provide heliport planning guidance to air and heliport operators - Dave Brown with Stantec believes responsibility lies with the heliport operator to protect airspace and zoning - municipalities cannot zone for airspace protection but they can impose height and coverage limitations based on other community priorities - designers like Stantec can provide education and guidance to operators and municipalities - airport zoning regulation can be applied but is difficult and costly to implement - must be applied when initial heliport certification is submitted - may have unintended consequences if municipalities don't want the airport zoning restriction

**ACTION:** IFR Committee operator member consensus to proceed with a request for action to help meet H1 heliport operational requirements using reasonable risk management methodologies.

- 7. **GPS Instrument Approach Criteria WAAS & LPV** - Presentation by John Ainsworth, Air Navigation Data
  - a. Cooperative IAP Design Process - Air Navigation Data has developed digital design tools to create helicopter GPS instrument approaches - cooperative design and QA partnership with STARS - AND digitally designs approach - Trains and qualifies STARS designers who review design, flight check, and manage QA process - work together to provide ongoing maintenance - AND maintains obstacle database - software evaluates obstacle impacts on a regular basis
  - b. On-the-fly IAP Design Trial - has worked with NRC to test on-the-fly GPS instrument approach procedures - requirement to generate a digital approach to an emergency landing site onboard within 2 minutes - test completed successfully
  - c. WAAS LPV precision approach procedure - vertical and horizontal guidance - very stable - only available for FW currently - will allow

aircraft to fly down to as low as 200' HAT - contained in FAA TERPS and will be harmonized by TC in the near future - no helicopter criteria for LPV - some criteria has been developed in the US for special operations - no plan in Canada for LPV approaches - much narrower obstacle clearance areas than current Copter criteria - in LPV the obstacle clearance surface is sloped like and ILS - minimum clearance is 200' at DH - provides for a stabilized approach - LPV has a larger missed approach area to assess - require lighting standards and heliport IFR certification standards to support the straight-in minima.

- d. PINSA - permitted for RW only currently - problem is there is very little guidance after leaving the MAP or point in space - no approach lighting required - TC wants to tighten up the application of standards with respect to obstacle assessment in transition and departure areas (BT)

**ACTION:** Support for a best practices working group to develop new criteria to support transition and departure assessment for PINSAs and/or heliport design criteria in support of straight-in TERPS 42a GPS criteria.

## 8. **ICAO HEMSSG best practice project report** - Bob Toews

- a. Tabled - Bob will arrange a conference call or web meeting following the ICAO HEMSSG meeting in Cologne to brief committee members and receive feedback (Cologne meeting was subsequently re-scheduled due to volcano eruption and disruption of air travel in Europe).

## 9. **NVIS Operational & Training Standards Workshop** (Wednesday)

Background - TC CBA request to develop a national standard or regulatory environment for use of NVIS in Canada - initial project assigned to Stephane Demers - no regulatory standards currently - all information is advisory - TC needs to partner with operators to develop guidance and standards - what restrictions are required? - concern over unsupervised use of grey market NVG by a variety of different operators and private users - what are other jurisdictions doing - what licensing requirements, aircraft equipment - need to regulate goggle maintenance - focus needs to be on a supportive framework that works within the SMS process

- a. Regulatory Tools

- i. *Regulatory development in Canada* is backlogged - we need to create a process which will provide guidance and support before regulations and standards are promulgated
- ii. *Ops Spec vs exemption* - ops spec need to refer back to a regulation - NPA can be developed and submitted and then enabled by exemption - we should reference other precedents - CAR 607 NPA has been submitted enabling use of NVG - need to create uniform interpretation across regions
- iii. *Australian Trial example* - research
- iv. *Exemption* - must fairly be available for those that qualify - there will still be a requirement for POC for 604 and 607 - application for private operators still to be determined - exemption must refer to a regulation -
- v. *Prohibition* - all segments must have an opportunity to use NVG safely within the context of their normal operating environment - recommend a national prohibition for RW on the use of NVG to be ratified by the committee after the regulatory and best practice framework is defined
- vi. *This NVIS Subcommittee* - will be a consensus based standing committee which will continue to work in partnership with TC on oversight and supervision of NVIS use in Canada until such time as a complete regulation and standard is implemented - the committee will invite all aviation segments affected by the prohibition to participate and receive guidance in the development of compliance procedures and practices.

b. *Required National Exemptions*

- i. *Authorization* - for use of NVG referencing the new prohibition (above) either with or without additional enabling exemptions listed below.
- ii. *CAR 602.115 Airspace* - ability to fly on NVG at night using day VFR minima - aided visibility to identify unlighted objects - goggle failure emergency procedures need to be considered.
- iii. *700 operator night MOCA* - alleviation which defines a reference altitude and pre-planning for NVG flight - goggle failure emergency procedures



- iv. *Landing LZ lighting* CAR 602.40 and CAR 722.18 (5) and CAR301.07 (9)
- v. *Heliport Design Criteria* - night vs day obstacle clearance and identification criteria - permission to operate to day-only certified heliports with appropriate restrictions.

c. *Advisory Circular*

- i. Sets the minimum training, operational, and equipments standards - *to be met to qualify for the basic (without additional operational exemptions) authorization*
- ii. *Reviewed* - (will be circulated to NVIS workshop attendees only and on request)

d. *Best Practice*

- i. *SMS* - can be used as a way of developing and supporting NVIS certification
- ii. *Industry Best Practices* - may developed to support NVIS exemption application and approval

e. *Standard , Certification & Maintenance*

- i. A sub-sub committee will make recommendations for equipment standards, certification, and maintenance
- ii. Volunteer members: Keith Gladstone, Dr. Greg Craig, Kim Harris, and Adam Aldous (Please confirm)

**ACTION:**

- distribution of marked up circular
- distribution of NVIS Workshop minutes
- formal request from HAC for prohibitions and exemptions based on above
- Go to Meeting or teleconference followup by end of May (or more realistically, June, 2010)

**10. ICAO HEMSSG Cologne Meeting Report**

The Cologne meetings scheduled for April 26 to 29 were cancelled at the last minute due to the eruption of the Iceland volcano. Bob T had departed early for a short vacation prior to meetings and was unable to return or cancel his travel arrangements for Cologne. Despite the meeting cancellation he was able to arrange for a tour of the ADAC HEMS Academy in Bonn and an interview with the Operations Manager for the Netherlands HEMS.

a. *Tour of the ADAC HEMS Academy, Sankt Augustin, Germany*

Werner Gelhausen, Director of Operations

Stephan Brade, Technical Director

- i. *Introduction* - ADAC operates 33 HEMS bases throughout Germany as a public service of the German Automobile Association. 17 m members support the HEMS service in addition to other normal association services (towing, battery boosts, etc) through an annual subscription fee. I did not ask about other sources of revenue (e.g. Insurance, direct government subsidies, etc). The HEMS Academy has been in operation for 1 year and has been in development for over 5. The first of the EC135 Type A full motion flight simulators has just come on-line and the second EC135/145 EFIS Type A simulator should be completed this year. A full-scale EC135 wooden wind-tunnel model serves as a ground ACRM training device and supports full crew (pilot, AMC, and Physician) interaction and LOFT. The medical training level consists of a CDT (computer training device) classroom and a realistic hospital ER hallway and fully equipped trauma room with one adult patient simulator. A pediatric simulator is planned but has not been purchased. The flight training floor consists of a CTD classroom, a lounge, operational flight planning room and access to the flight simulators.
- ii. *Flight simulators* - are full motion Level A simulators developed under contract by cueSim in the UK ([www.cuesim.com](http://www.cuesim.com)) - ADAC flew about 40 hours to collect EC135 & 145 flight data using an auto-pilot test computer which recorded data points including acceleration - the EC135 cockpit simulates the instruments using background LCD computer screens and cutout mask - all switches and knobs were aircraft realistic and worked as in the actual aircraft - wide-angle off-the-shelf projection displays are used for the visual simulation - included confined area, local airport, and hospital helipad scenarios - photo realism was good -

simulator flew well with a bit of mild control surging or feedback when making larger inputs - generally compared to much more expensive CAE type simulators

- iii. *Air Crew Resource Management* - ADAC places a strong emphasis on ACRM - nurse AMC are given 3 weeks of initial training, most of which focuses on aeronautical subjects to train them to fill the role of second flight crew member - complete LOFT in the simulator with pilots - learn to operate radios, interpret weather, read checklists, etc
- iv. *Air Medical Crew as Cockpit crew members* - ADAC coverage is provided from 0700 hrs to sunset - no night flying and no NVG - normally helicopter flies a physician and single nurse AMC to scene (approx 80 to 90% of flights are scene - do not normally do inter-facility) - physician normally transports patient by ground with or without AMC - if weather is lower than normal Jarops 3 commercial air limits (but above Part 2 HEMS limits) the AMC must remain in the cockpit to assist the pilot for the flight to base, or to the hospital if the patient is flown - in the latter case the physician will have to provide care on his/her own - if weather is at or above Jarops commercial standards then the pilot may elect to fly the return flight single crew - AMC is considered to be a full air crew member with the only limitation of not being able to fly the helicopter - the physicians are given ACRM training but otherwise are not considered to be air crew members - most of the physicians supporting the ADAC program are contracted from the local hospital(s) - the hope is to be able to bring them all through the academy eventually but the first priority is to train existing AMC and pilots using the new simulators first
- v. *Weather Minima and CFIT* - ADAC uses Jarops 3 weather and crewing standards and minima - we discussed crew SOPs and the discipline required to avoid descent into the obstacle rich environment when lower weather is encountered enroute - no mention was made of specific SOPs which prevent pilots from descending however their flight operations are day only - neither Werner or Stephan saw this as being a significant safety risk at ADAC - believed their company's culture, emphasis on ACRM, use of the AMC crew member, and the lack of competitive or financial pressure help ensure their pilots maintain safe and compliant flight - no tendency to push weather - they stressed this is true in their opinion of ADAC but is not necessarily true

for all European operators - there is no common European aviation culture which makes European HEMS inherently safer than other jurisdictions

- vi. *Foundation of Safe HEMS* - Werner suggested our HEMSSG recommendations should focus on ACRM, ADM, building a strong safety culture (SMS) and ensuring the compensation system is revenue neutral - technology can support the above but will not improve safety without the fundamentals - emphasis on the role of simulation for training - esp practical, hands -on ACRM

b. *Interview with Daan Remie ANWB Medical Air Assistance*

- i. *Weather Limits* - in Europe all HEMS flight phases are considered commercial (as opposed to Part 91 positioning in US) - Jarops has a separate Part 2 exemption from normal commercial weather requirements for HEMS - Daan believes Jarops 3 Part 2 exemptions are reasonable - also in Europe each base is dedicated to an operational area - pilots are not aware of financial pressures - ANWB pilots do not descend in lowering weather except to make a precautionary landing or to descend to 800' AGL (night) for mission abort and return if normal cruise altitude cannot be maintained (1000 AGL for normal night cruise) - a similar SOP exists for day ops - limited night HEMS in Europe - low level IFR infrastructure in Norway allows them to avoid higher routes
- ii. *Formal dispatch procedures* - availability of timely and accurate weather is critical for safe dispatch decision-making - in the Netherlands the aircraft request is made by local, government run 911 - Daan believes dispatch decision should remain with pilot but more supporting resources and better information sharing required
- iii. *AMC as Flight Crew Member* - Jarops 3 Part 2 - for night ops the second pilot can be replaced with medical crew member who has received aeronautical training - if AMC is used for night it must be restricted to a local area - ANWB flies with AMC (nurses) working in a multi-crew concept - radio license, CRM, Norwegians include them in simulator training sessions (as will ADAC) - reading checklists - in Netherlands AMC is required to complete all of the private pilot license other than actual flying including performance calculations - flight training proficiency,



# HAC

LOFT and NVG completed annually in the aircraft - for night VFR the AMC must be in the cockpit - physician must take care of patient by themselves or transport by ground - by day the weather determines whether the AMC must fly as a flight crew member

- iv. Aeronautical Decision Making - Daan, like Werner at ADA, is convinced that good ADM and CRM must be the foundation for safe flight operations - is not convinced that technological solutions by themselves will solve the problem
- v. NVG - Danan believes NVG they are essential for night ops except for local areas with high levels of cultural lighting.

**ACTION:** report back to ICAO HEMSSG. Continue to prepare research and HEMS hazards analysis in preparation for next HEMSSG meeting (postponed to fall 2010)



## **IFR Committee Meetings 2010 HAC Conference Attendee Lists**

### ***General Meeting Sunday, April 11, 2010***

Greg Craig	National Research Council	<a href="mailto:greg.craig@nrc.ca">greg.craig@nrc.ca</a>
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### ***Helicopter Performance Meeting, Monday, April 12***

David Brown		
Stephane Demers		
Matt Nicholls		
Keith Walker		
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Greg Craig		
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Walter Heneghan		



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***NVIS Working Group Wednesday, April 14, 2010***

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