IHST Global Safety Survey Results

Executive Summary: Participation in the International Helicopter Safety Team's (IHST) third, global safety survey in 2017 was more than double that in past years. Overall use of the IHST's key recommendations in 2017 was 59% - up from 42% in 2016. Operators in the USA provided 69% of the survey responses and their overall use of the key recommendations improved from 39% to 61%. Australia showed even better improvement, going from 36% in 2016 to 62% in 2017. Helicopter operators with nearly all types of operator certificates and operators using helicopters for nearly all purposes showed significantly more use of the key safety recommendations. Personal/private operators still report the lowest use of the IHST's key safety recommendations, and they remain the focus of the IHST's ongoing safety promotion efforts.

Survey and Report Purposes: This report describes the results and conclusions that may be drawn from the IHST's third, global safety survey. Repeating the process done in 2015 and 2016, the IHST promoted a global helicopter safety survey throughout 2017 to judge awareness and use of its products. In addition to promoting the IHST's work, the survey is intended to measure how broadly the IHST's key recommendations are being used. The increased survey participation in 2017, together with the results from 2015 and 2016 is beginning to show a correlation between adoption of the IHST's recommendations and accident experience. The results clearly show that the IHST needs to focus its efforts on personal/private operators.

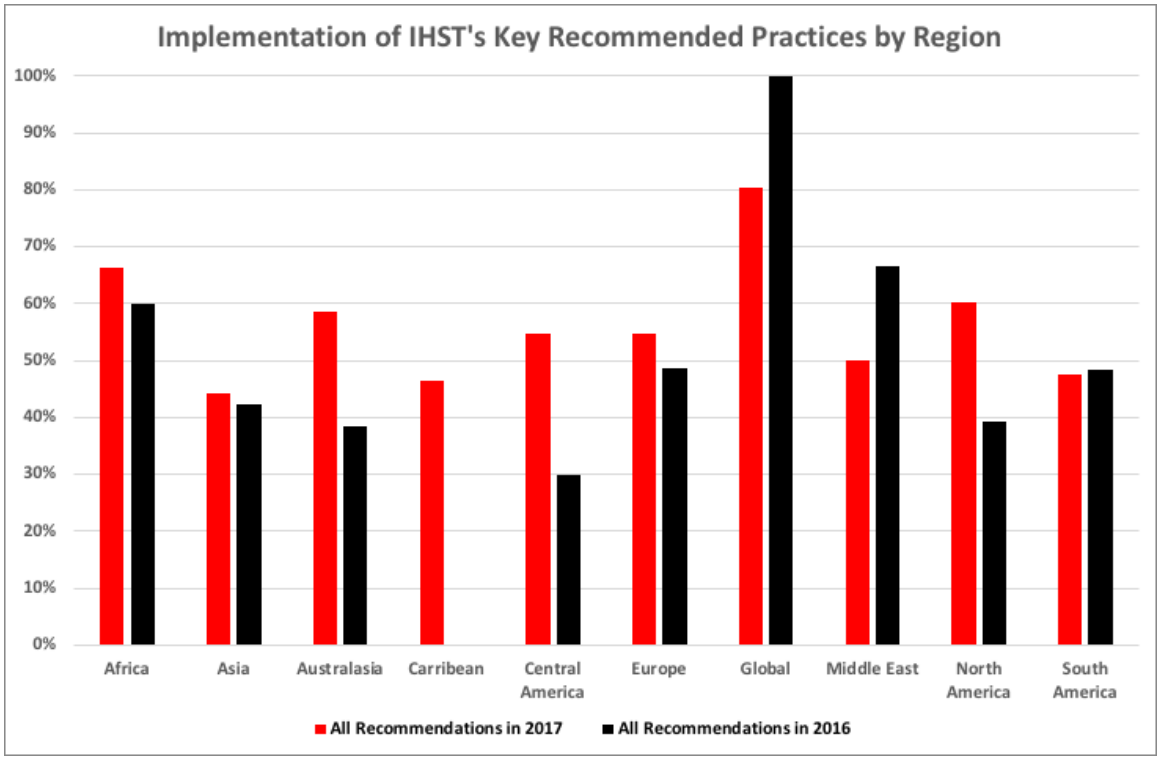
Survey Participation: Thanks to strong promotion by IHST supporters, including the US Federal Aviation Administration (FAA), the European Aviation Safety Agency (EASA), Helicopter Association International (HAI) the European Helicopter Association (EHA), and the major helicopter manufacturers, participation in the 2017 was more than double that in past years. There were 351 responses to the survey from 53 different countries in 2015 and 340 responses from 44 different countries in 2016 survey. In 2017, there were 729 responses from 60 different countries.

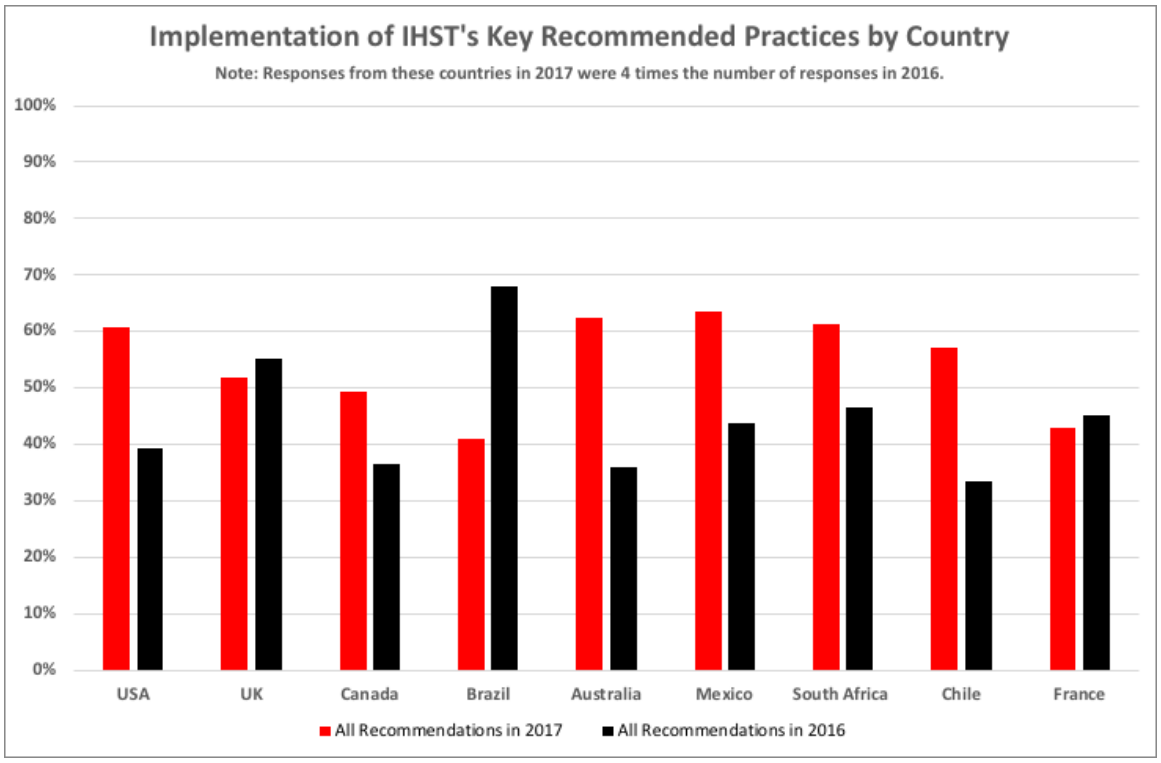
Key Safety Recommendations: The IHST's regional teams have analyzed over 1,000 helicopter accidents and concluded that the following four areas offer the best opportunities to prevent helicopter accidents:

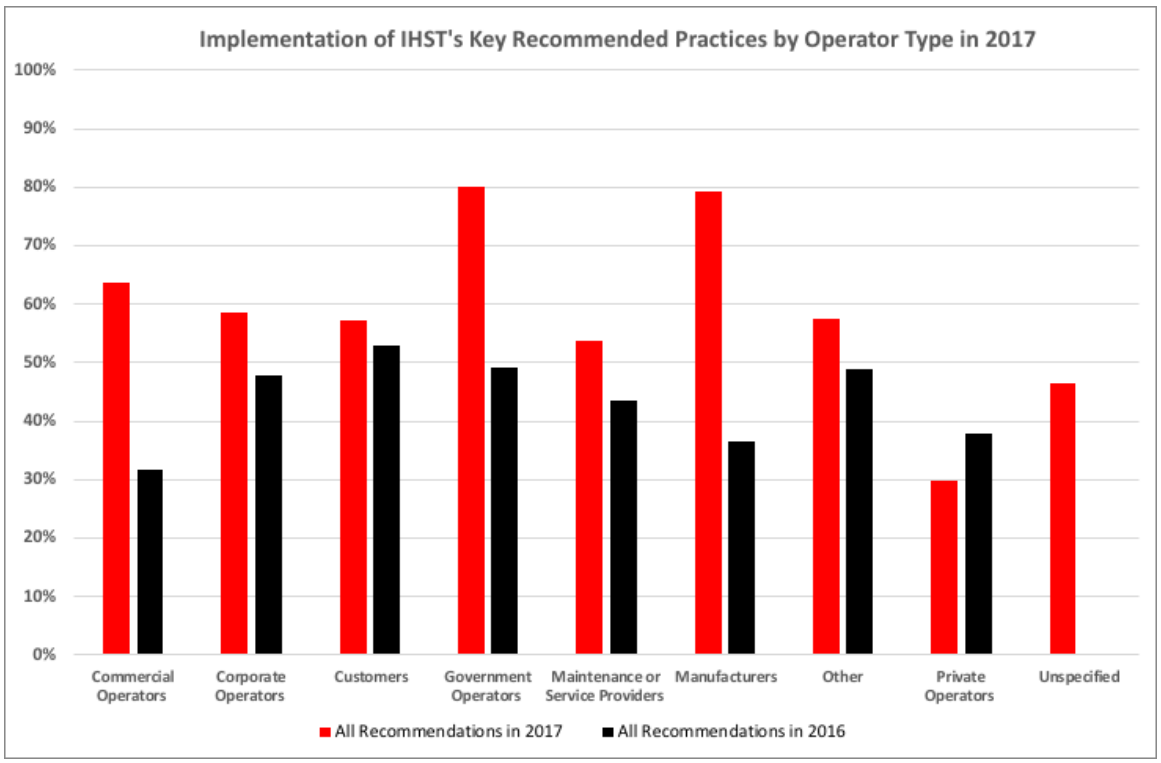
1. Safety Management Systems (SMS)
2. Structured programs for initial and recurrent training
3. Mission-specific systems and equipment, including:
    a. Health & usage monitoring systems (HUMS)
    b. Flight data monitoring (FDM) programs
    c. Night vision goggles
    d. Wire strike protection
4. Structured programs to fully comply with manufacturers' recommended maintenance practices

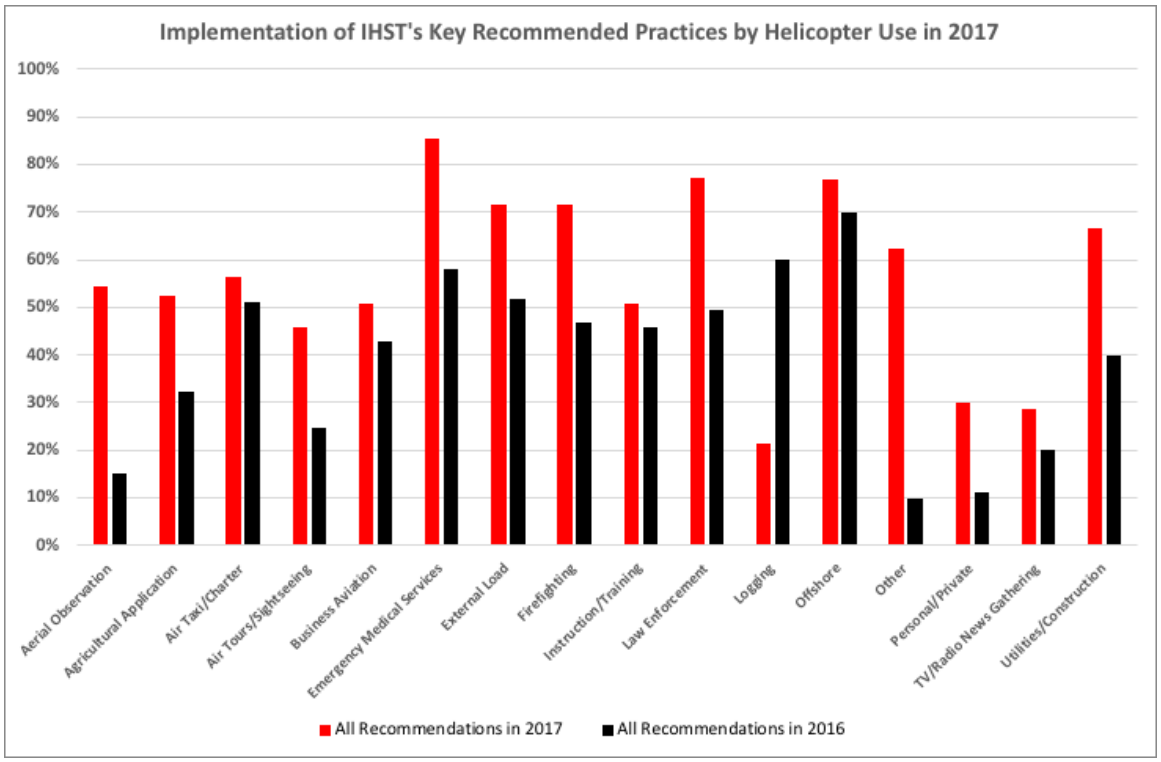
The IHST and many other industry stakeholder groups are actively urging operators of all types to adopt these practices. The IHST's global safety survey is intended to assess the progress toward full implementation of these practices within each industry sector in every region. While some of the recommended systems and equipment have mission specific application, the recommendations for SMS, training and maintenance practices are universally applicable.

Results: The following figures show the overall survey results by region, by country, by operator type and use. The survey questionnaire and supporting text is at Appendix 1. A complete set of charts showing various breakdowns of the survey results in provided in Appendix 2. In all surveys conducted so far, the responses by country generally fall in line with the number of helicopters in those countries.




Implementation of IHST's Key Recommended Practices by Country
Note: Responses from these countries in 2017 were 4 times the number of responses in 2016.
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
USA
UK
Canada
Brazil
Australia
Mexico
South Africa
Chile
France
All Recommendations in 2017
All Recommendations in 2016

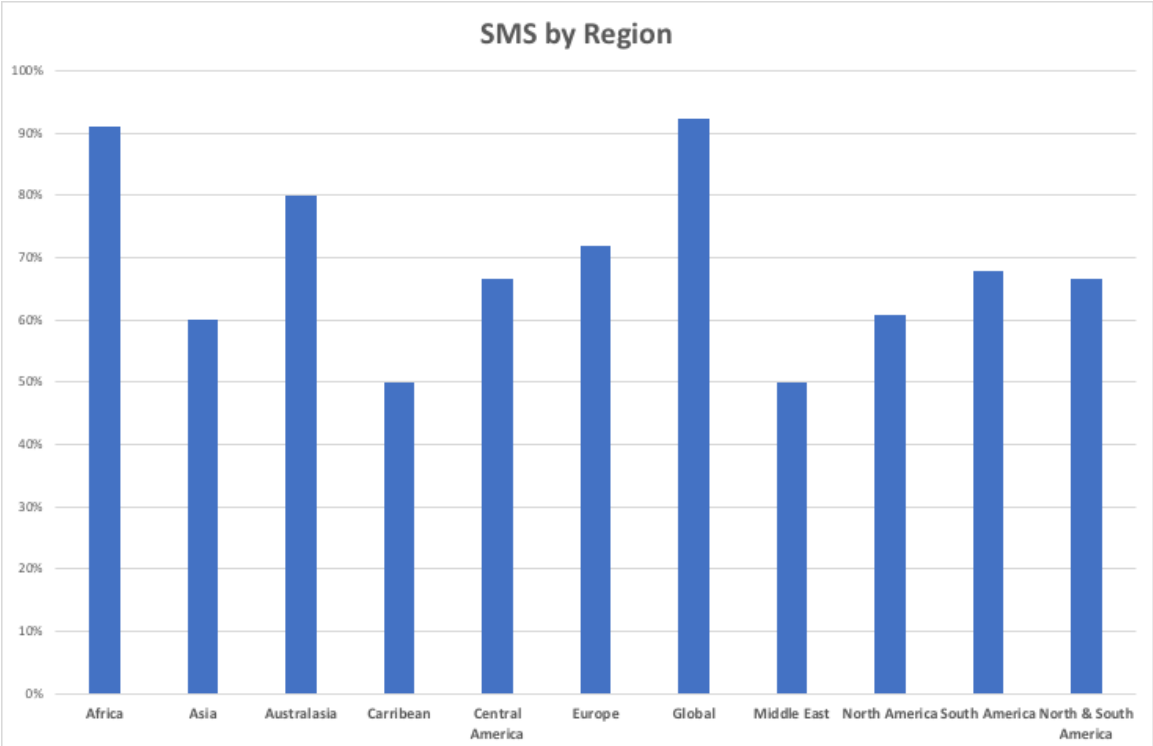

Implementation of IHST's Key Recommended Practices by Operator Type in 2017
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Commercial Operators
Corporate Operators
Customers
Government Operators
Maintenance or Service Providers
Manufacturers
Other
Private Operators
Unspecified
All Recommendations in 2017
All Recommendations in 2016

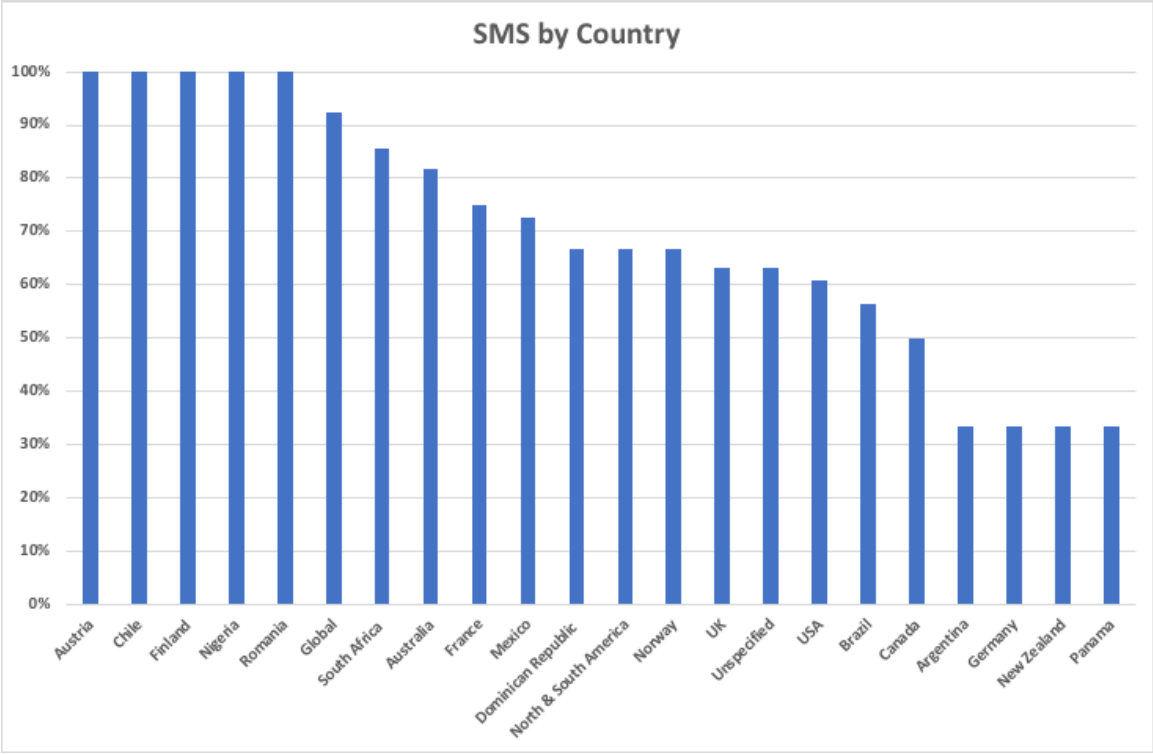


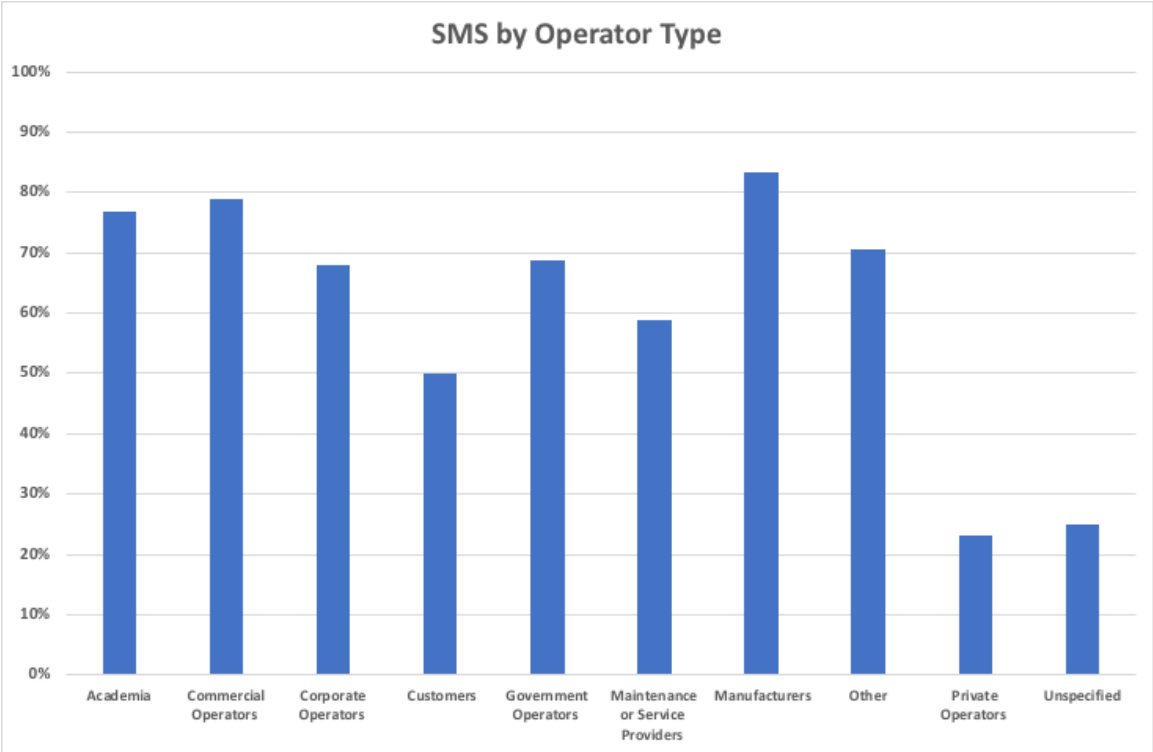
Even though survey participation was much higher in 2017, the 729 responses are still a small sample for the more than 35,000 civil helicopters in the world. We do not propose that these results are a representative sample. These results may in fact represent some of the best operators in the civil helicopter industry who were willing to state their positions with regard to the IHST's work. Nevertheless, these results do give indications of which of the IHST's top safety recommendations are gaining the broadest acceptance. As stated last year, we must acknowledge that the IHST's top safety recommendations may be getting implemented for reasons other than the IHST itself.

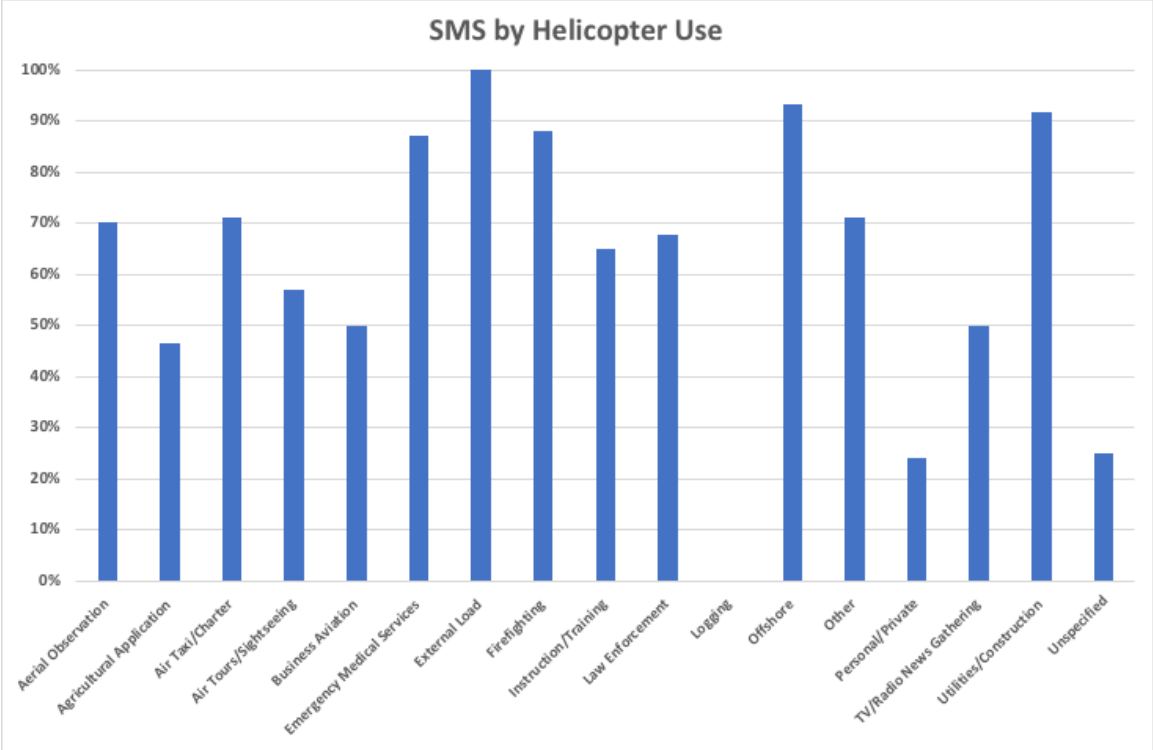
The most fundamental of the IHST's recommendations, which supports the other recommendations is for safety management systems (SMS). Sadly, many personal/private operators believe that SMS is only for big companies with lots of helicopters. The truth is that SMSs can and should be developed for any size operation, including individual owner/operators. An SMS is simply a structured and systematic way of assuring that all significant risks have been identified and are being managed to a level as low as reasonably practicable. For the individual owner/operator, the SMS should, among other things, assure that the helicopter's maintenance is being carried out in accord with manufacturer's recommendations, that the pilot is getting the appropriate check rides and training to assure ongoing competency, and that a pre-flight risk assessment is done before every flight. Several versions of SMS toolkits and other safety management materials are available for free download at http://www.ihst.org/Default.aspx?tabid=3053&language=en-US.

Here are the 2017 results for SMS use:



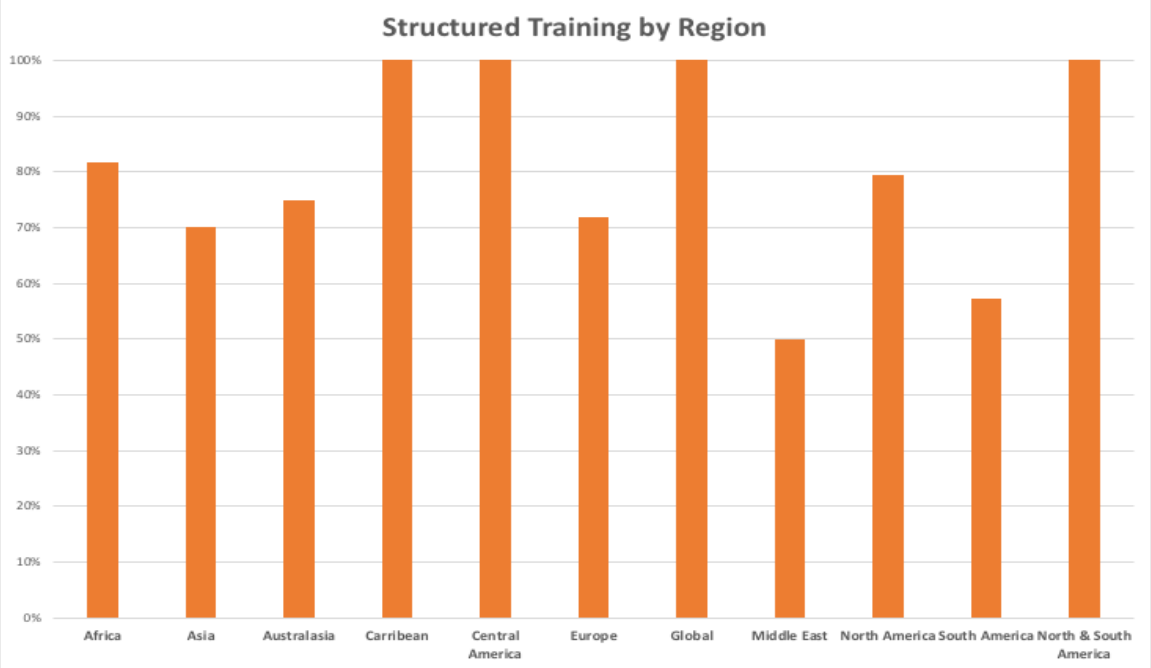


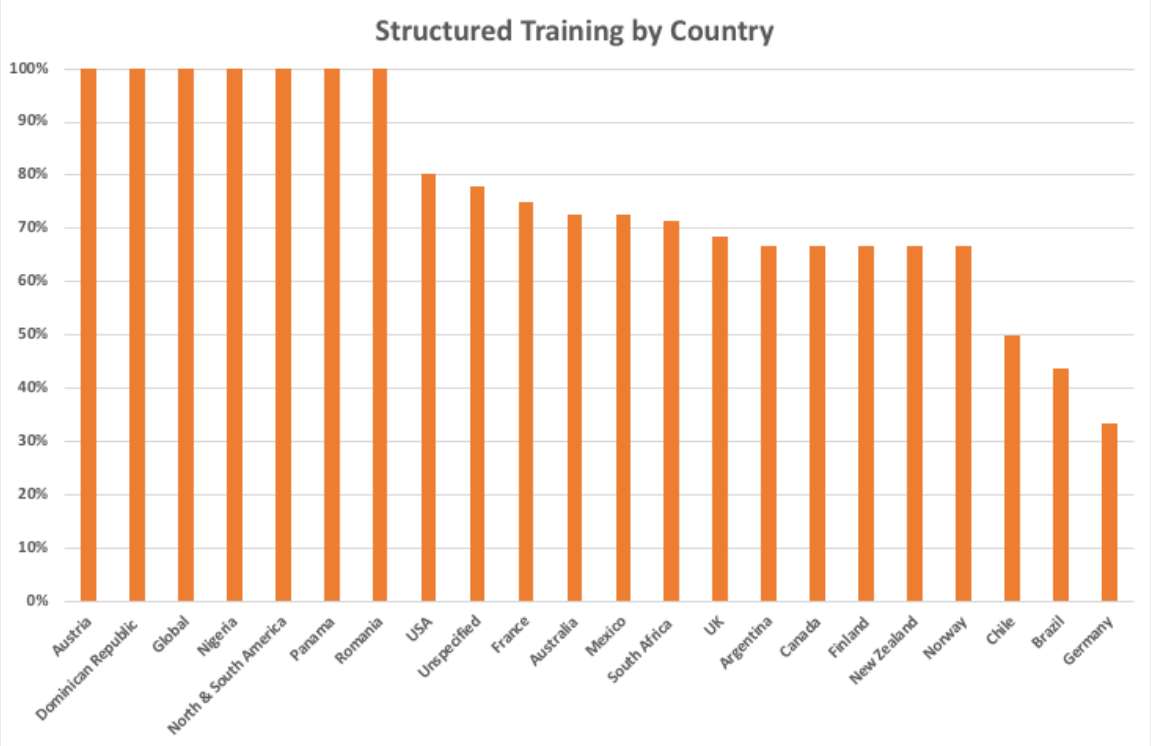


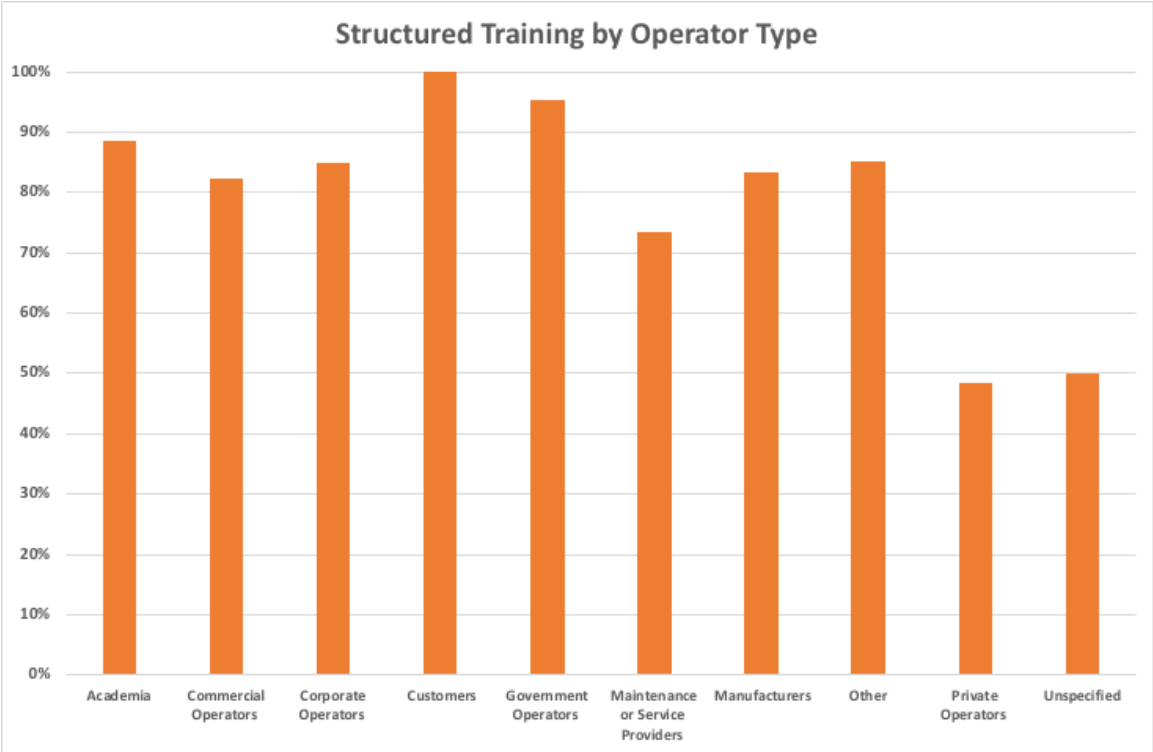


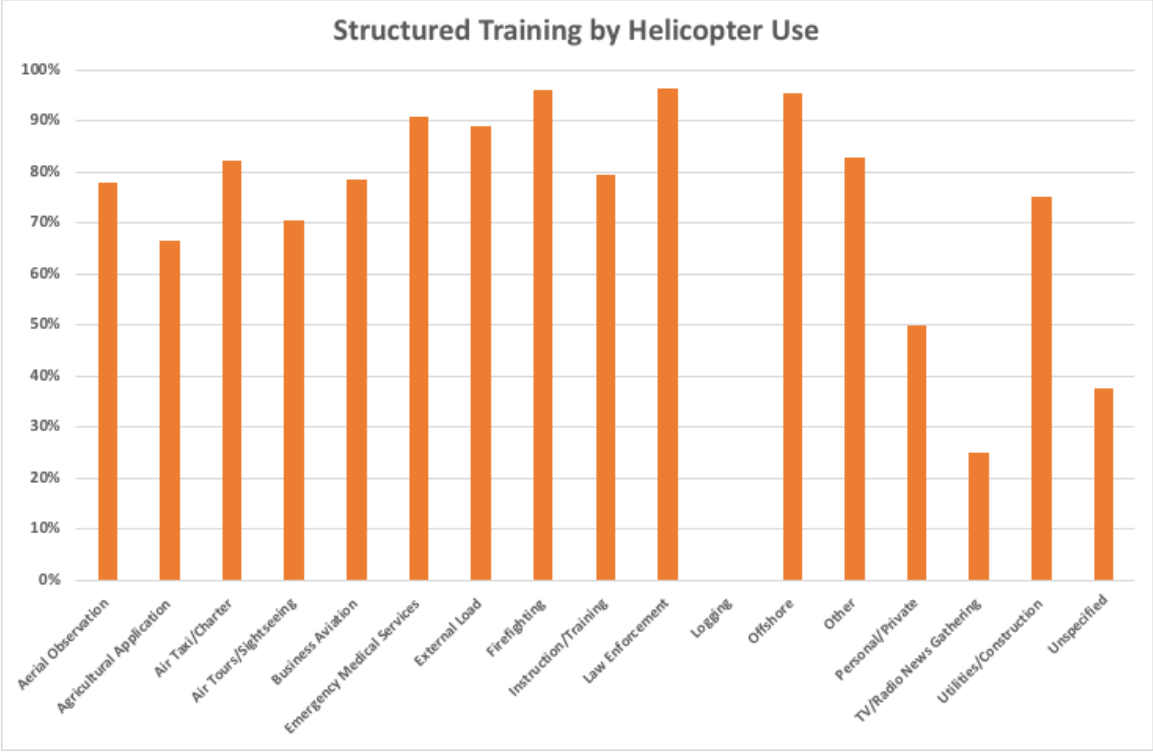
In fairness to the many helicopter operators in the logging business, the poor survey result shown on this chart comes from only two responses.

After SMS, the next recommendation that can do the most good is training. The IHST's free training toolkit, based on lessons learned from accident analyses, offers guidance for all helicopter operators to develop and maintain effective training programs. You can find the training toolkit and other training materials at http://www.ihst.org/Default.aspx?tabid=3048&language=en-US. Here are the 2017 survey results for training.



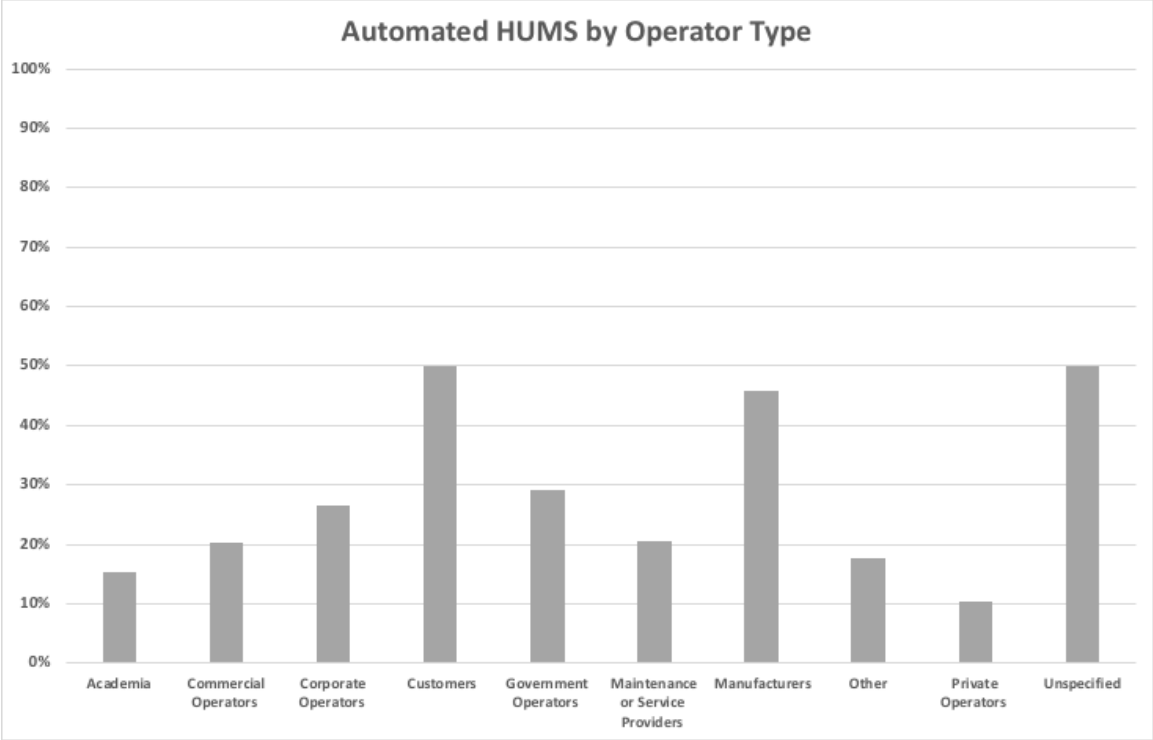


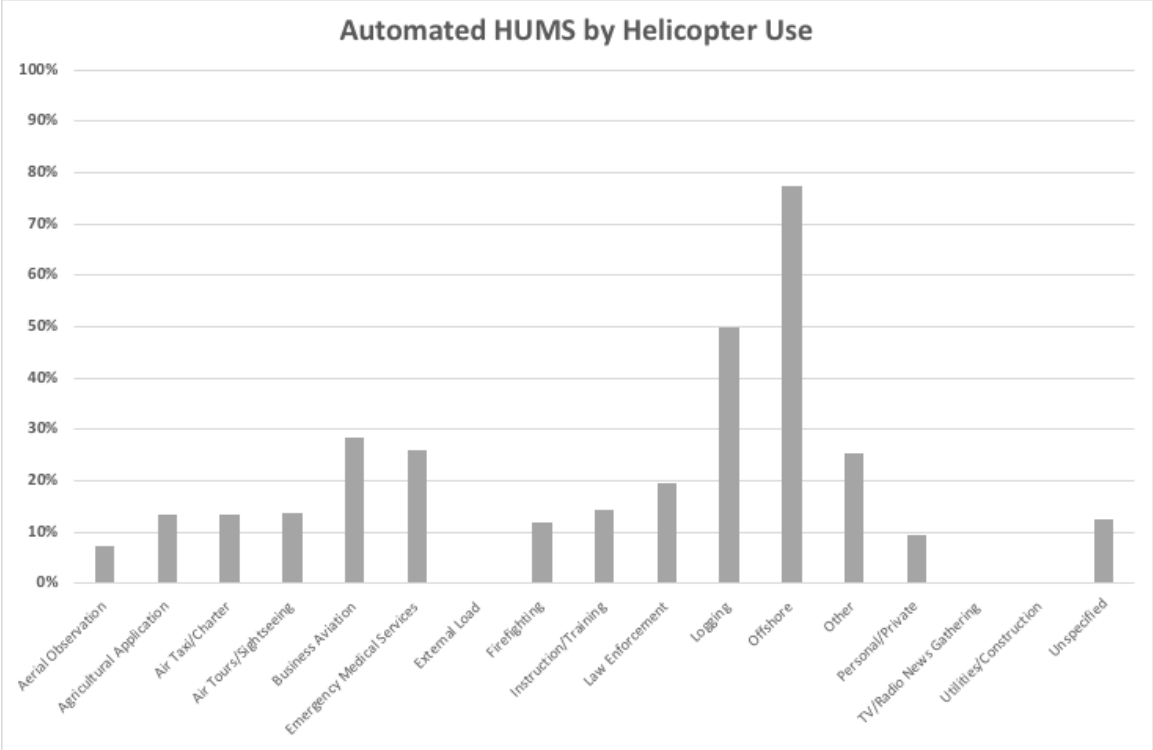




Again, please note that there were only two survey responses from operators using helicopters for logging.

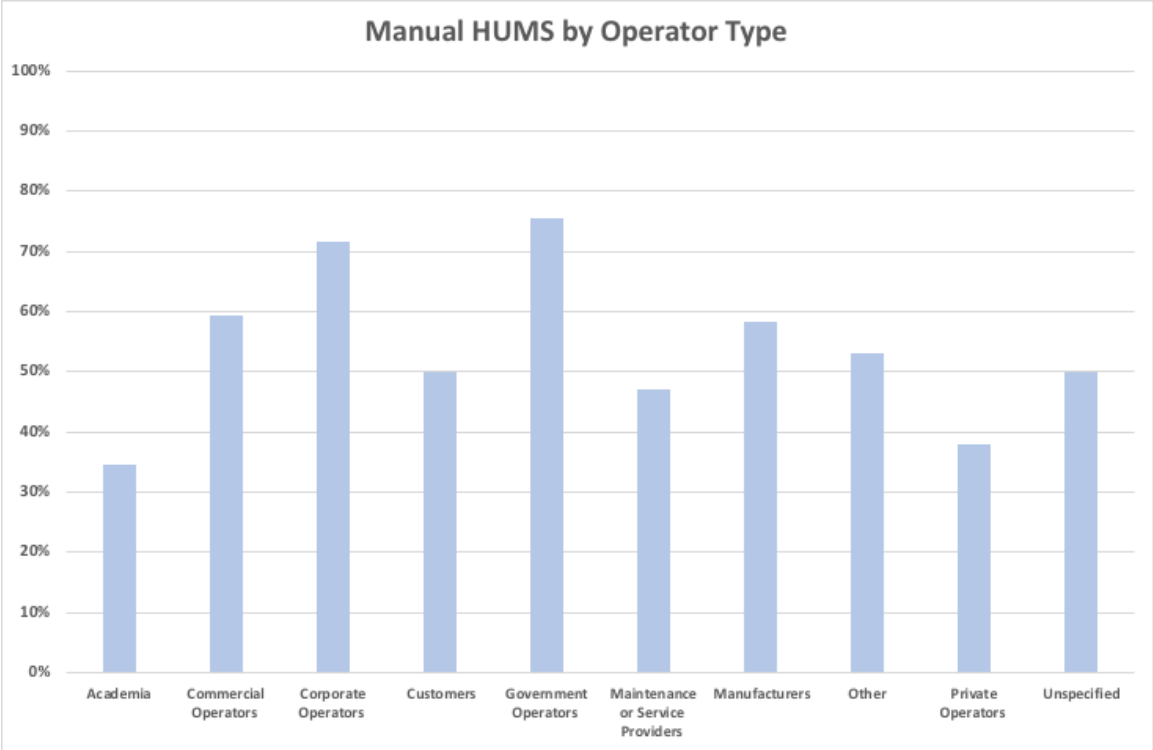
As seen in 2015, the use of fully automated health & usage monitoring systems (HUMS) is still relatively low everywhere.

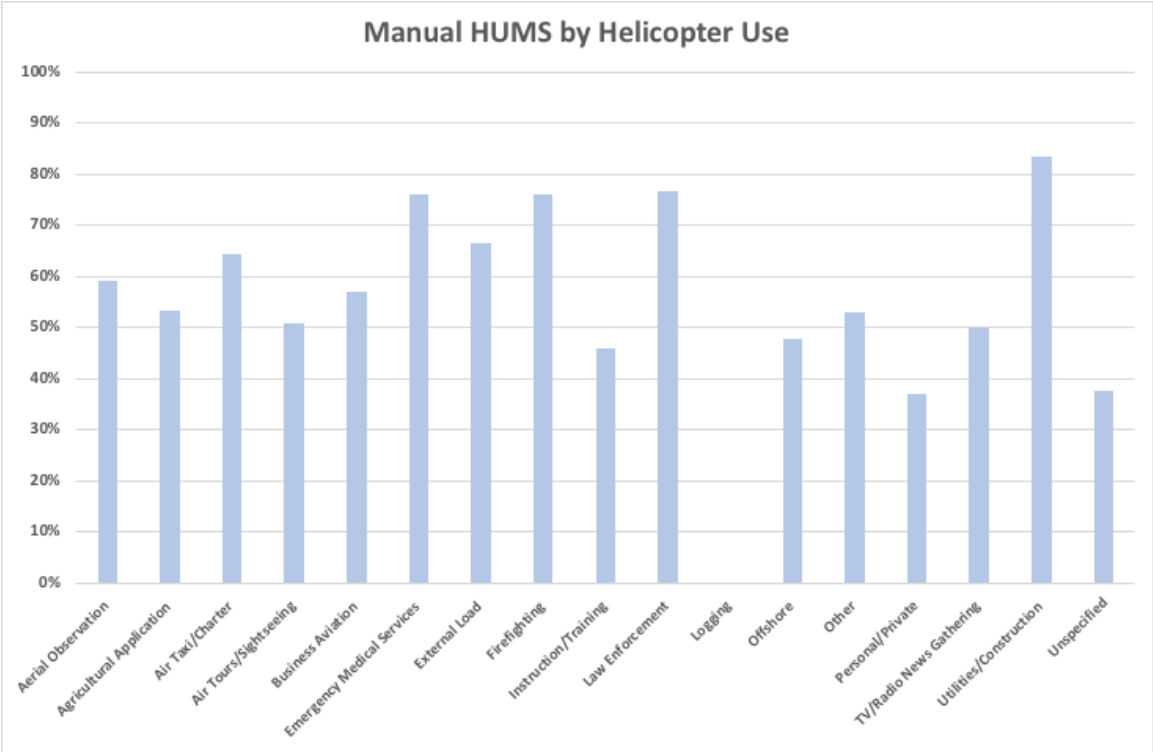




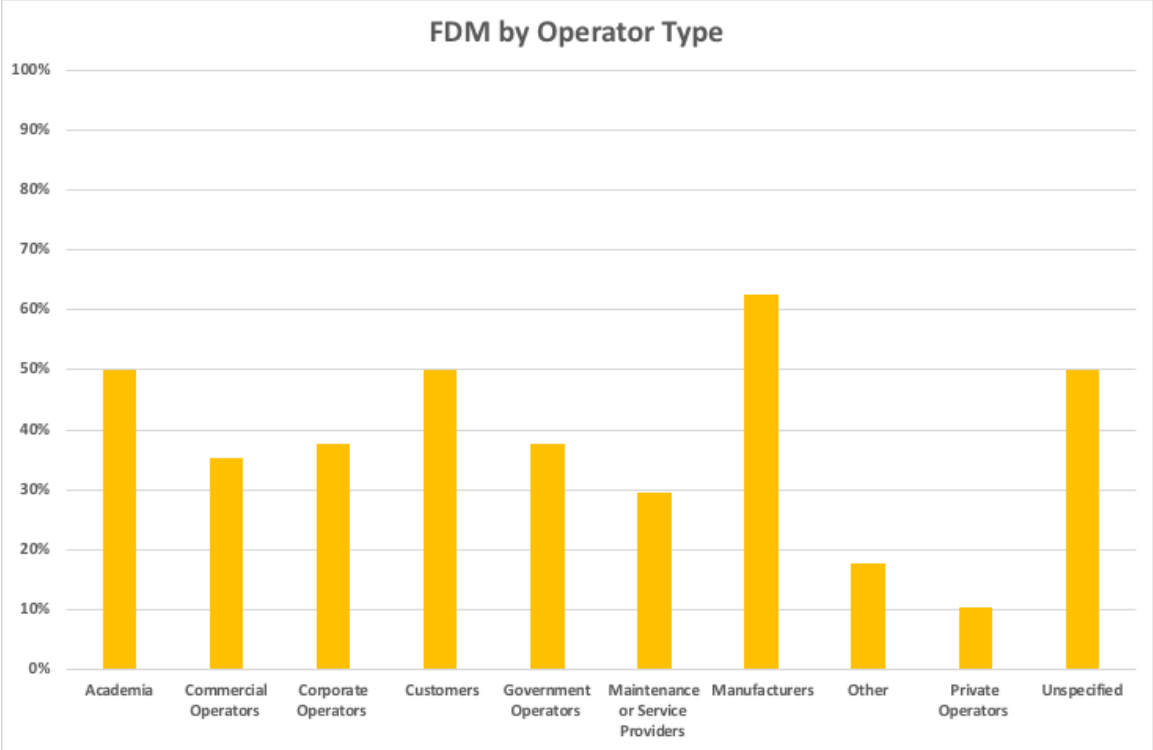
Once again, we find the highest levels of HUMS implementation in offshore where the oil & gas industry sponsored HUMS development in the late 90s and many oil & gas companies have required it for many years. To learn more about how to implement HUMS, see the IHST maintenance toolkit and the HUMS toolkit available for free download at http://www.ihst.org/Default.aspx?tabid=3050&language=en-US.

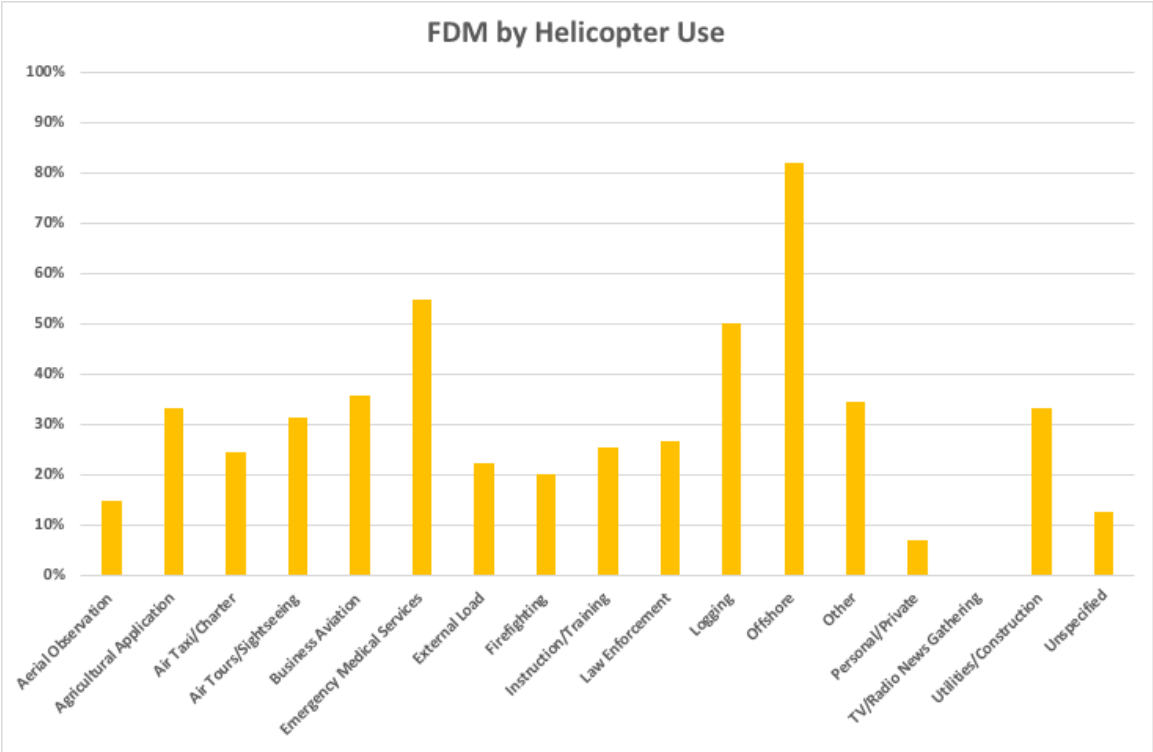
Recognizing that many older designs and small helicopter types do not have certified HUMS available, the 2017 survey asked if operators who said they didn't use automated HUMS used manual health and usage monitoring techniques to identify equipment problems before that equipment fails by manually monitoring certain parameters, recording data and noticing trends. Examples include engine start data, especially hot starts, power check data, and oil sampling. It is very reassuring that the sum of automated and manual HUMS is close to 100%.





Turning to the use of flight data monitoring programs, we also find relatively low implementation.

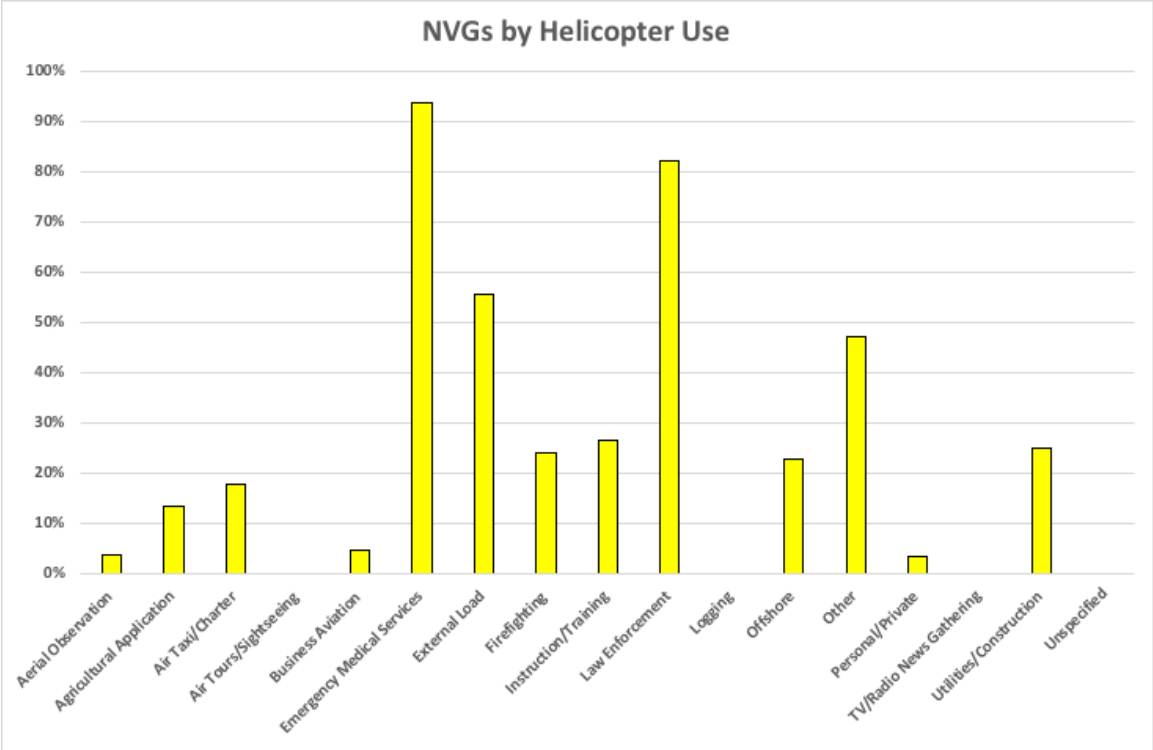


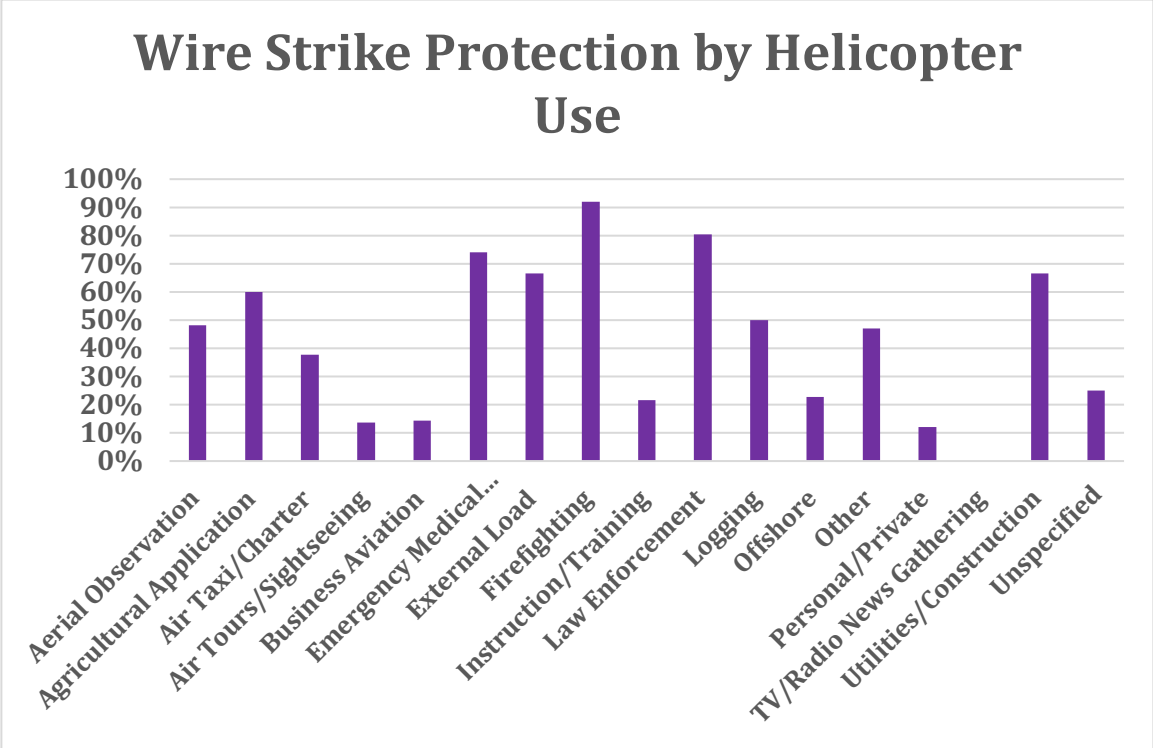


As seen in prior surveys, the offshore industry has the highest level of FDM use. The 2017 responses from operators using helicopters for emergency medical services (EMS) shows a promising increase in the use of FDM systems. Globally, 56% of the 105 EMS operators responded to the survey said they now use FDM. In 2016, that percentage was only 33%. In the USA, use of FDM by EMS operators increased from 40% to 62%.

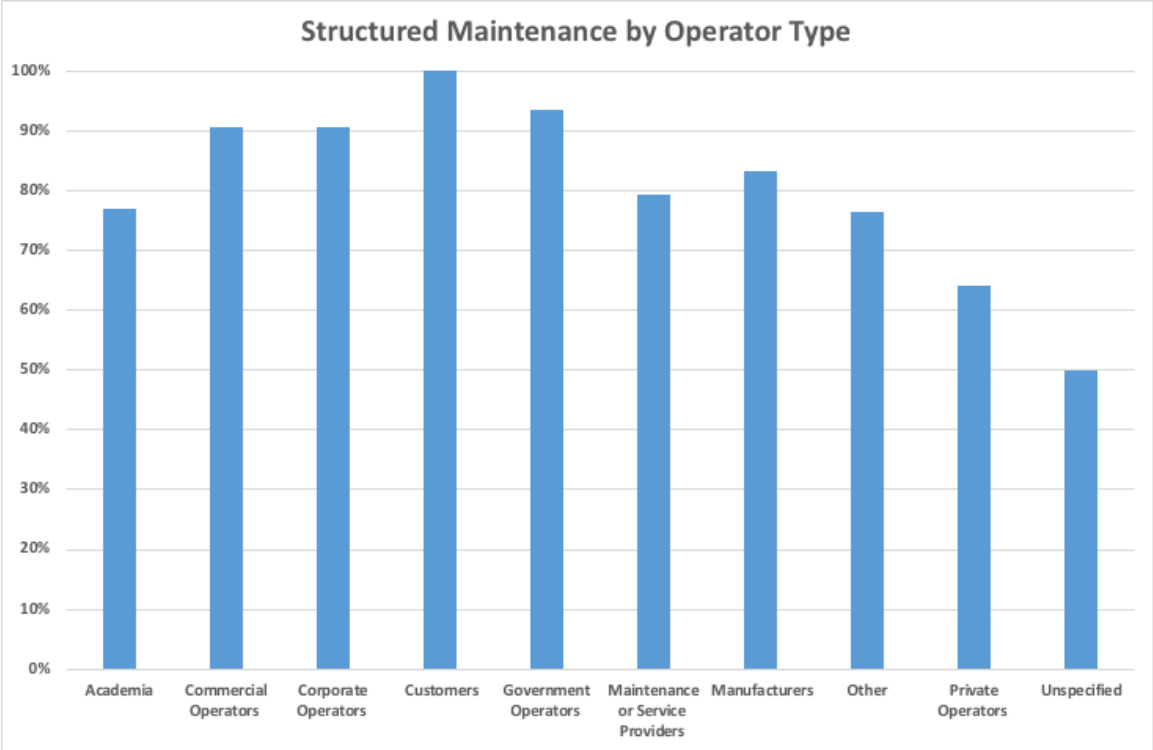
It is particularly disappointing to see that of the 83 operators using helicopters for instruction and training, only 24% are using FDM. FDM can be particularly valuable in the training environment by enabling students to review their flights. Perhaps many operators are unaware of the low-cost technologies available for FDM. A list of such resources is given in Appendix B of the IHST's FDM toolkit, available for free download at http://www.ihst.org/portals/54/2011HFDM.pdf.

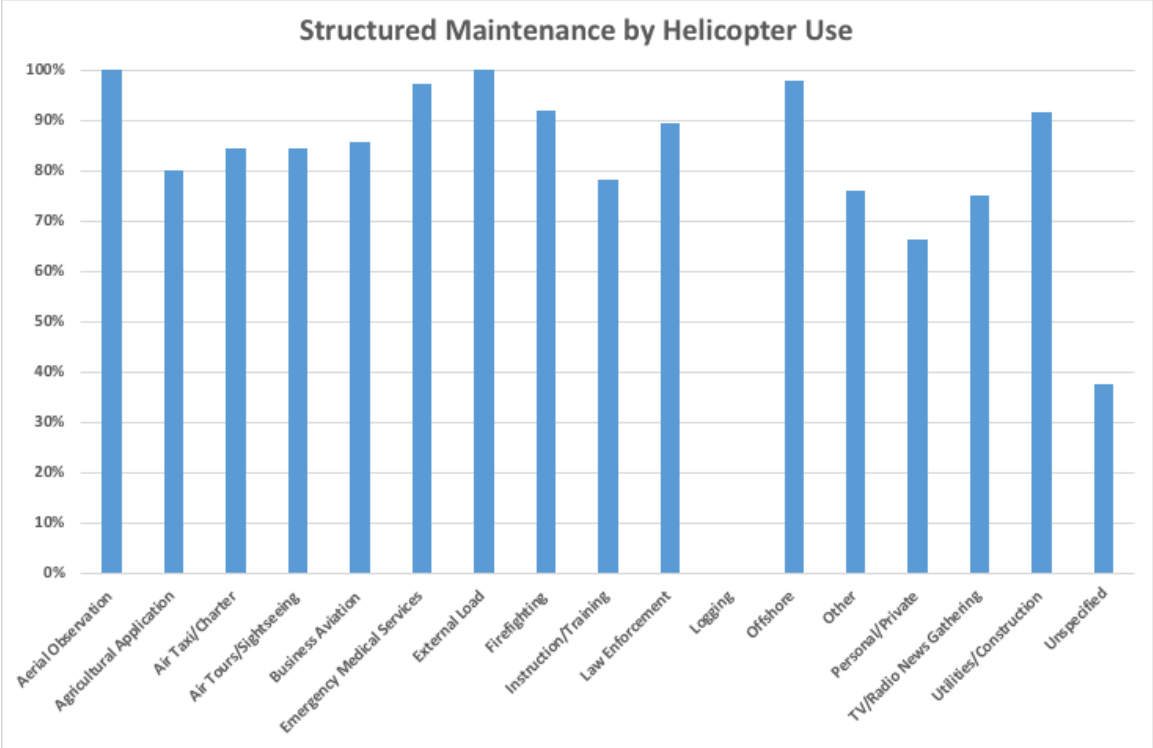
The 2017 included questions about the use of night vision goggles (NVGs)and wire strike protection. EMS operators lead the way in the use of NVGs. 100% of US EMS operators responding to the survey use NVGs.





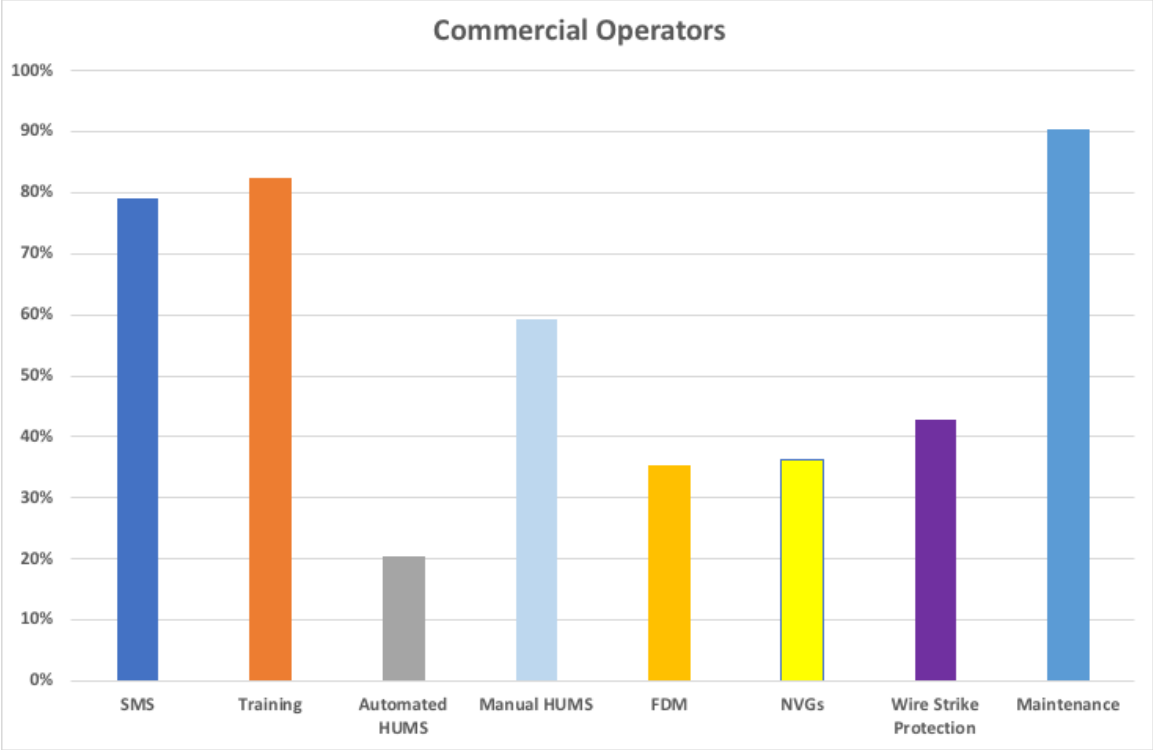
The use of structured programs to fully comply with manufacturers' recommended maintenance practices is more widespread than the use of HUMS or FDM, but not as universal as it should be.

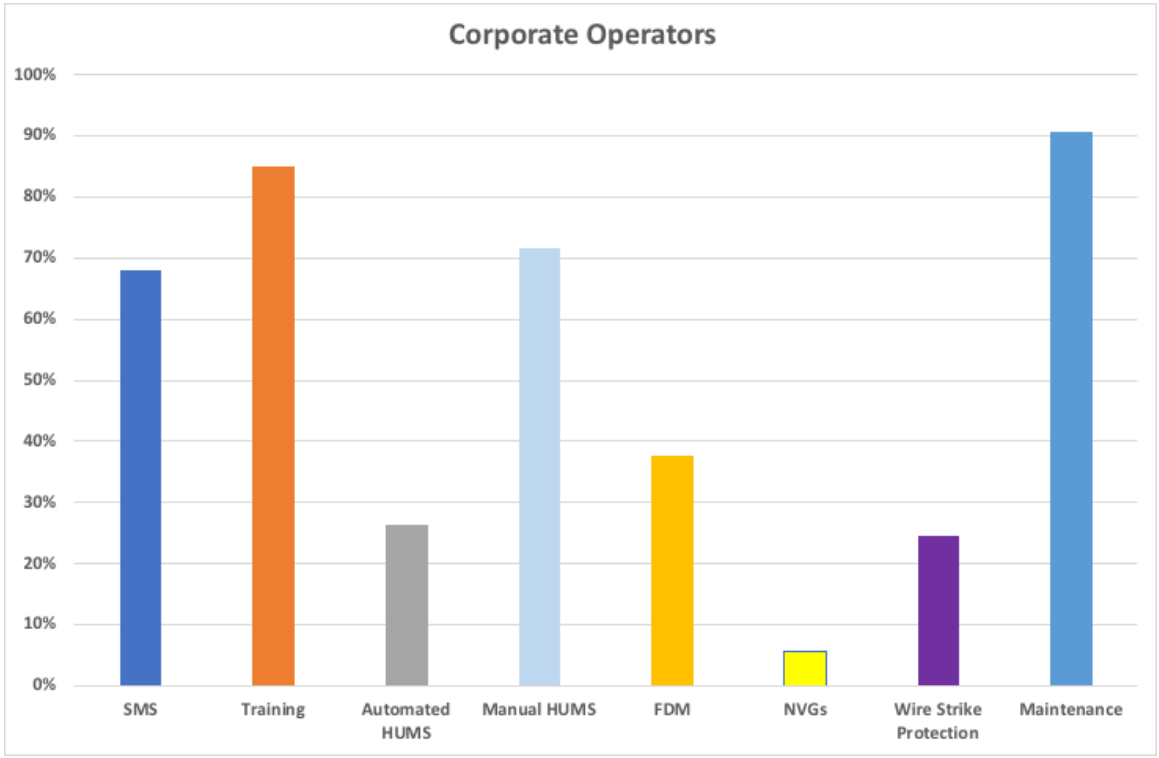


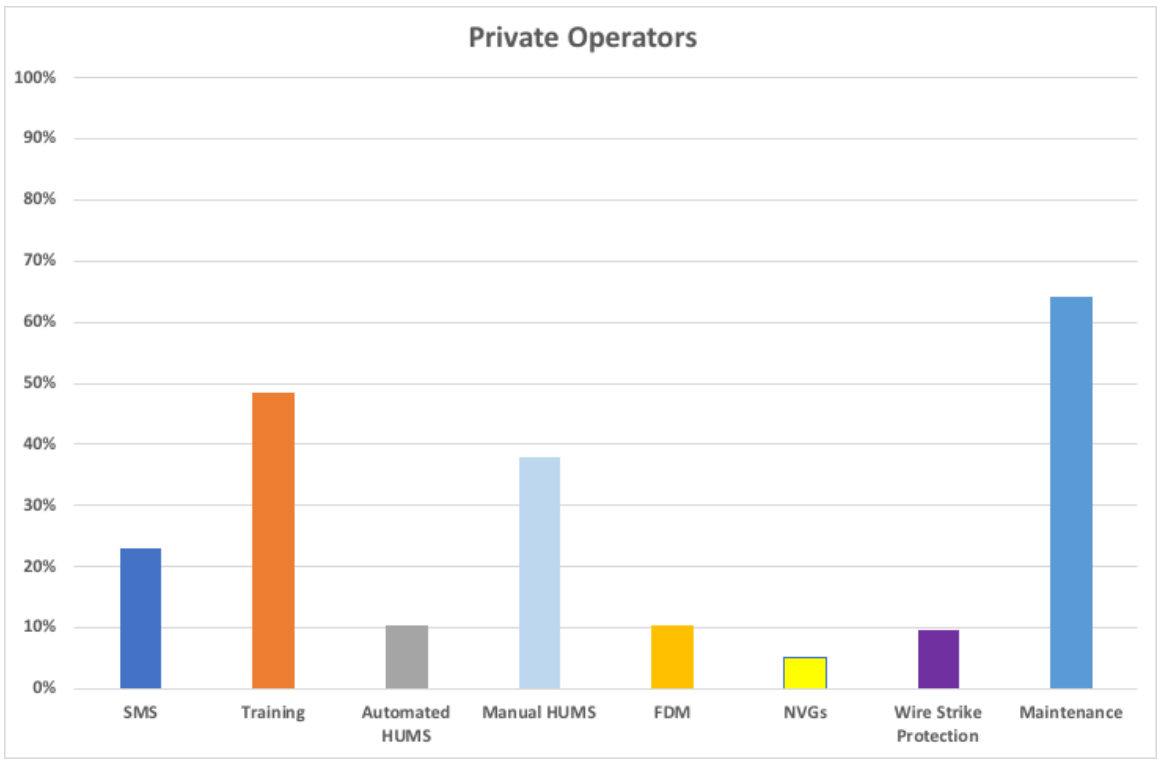


Those using helicopters for personal/private or unspecified purposes have the most to gain. The IHST's free maintenance toolkit shows how http://www.ihst.org/LinkClick.aspx?fileticket=uhdMiyXCSCE=&tabid=1507&language=en-US.

As seen in prior survey results, private operators using helicopters for personal use have adopted relatively few of the IHST's recommendations. This result correlates with the IHST's analysis showing that the personal/private operators have high accident counts. Hence, these operators have the most to gain from adopting the IHST's key recommendations. The following charts show the gap between private operators' use of the IHST's key recommendations and commercial and corporate operators.




Corporate Operators
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
SMS
Training
Automated HUMS
Manual HUMS
FDM
NVGs
Wire Strike Protection
Maintenance


Private Operators
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
SMS
Training
Automated HUMS
Manual HUMS
FDM
NVGs
Wire Strike Protection
Maintenance

Conclusions: The results show that adoption of the IHST's key recommendations is highest in the groups with the lowest accident rates, particularly the offshore helicopter operators. So, although correlation does not necessarily mean causation, it appears clear that the IHST's key recommendations are very effective in preventing helicopter accidents.

Another conclusion that may be drawn from this correlation is that customer awareness of and insistence on the use of best practices for safety can be as important as regulatory support. The challenge for those who share the IHST vision of zero accidents is to engage all those who use helicopters in reviewing the overwhelming evidence for these best practices:

1. Safety Management Systems (SMS)
2. Structured programs for initial and recurrent training
3. Mission-specific systems and equipment, including:
    a. Health & usage monitoring systems (HUMS)
    b. Flight data monitoring (FDM) programs
    c. Night vision goggles
    d. Wire strike protection
4. Structured programs to fully comply with manufacturers' recommended maintenance practices

The IHST Executive Committee has committed to repeat this survey every year. If you completed the survey in 2015, 2016 or 2017, please do so again in 2018 so that we can build a growing base of annual status reports from helicopter industry stakeholders on their use of the key best practices recommended by the IHST.

Look for a relaunch of the IHST global safety survey on www.IHST.org. Spread the word!

Appendix 1

IHST Global Helicopter Safety Survey

The IHST's regional teams have analyzed over 1,000 helicopter accidents and determined that the following four areas offer the best opportunities to prevent helicopter accidents:

1. Safety Management Systems (SMS)
2. Structured programs for initial and recurrent training
3. Mission-specific systems and equipment, including:
    a. Health & usage monitoring systems (HUMS)
    b. Flight data monitoring (FDM) programs
    c. Night vision goggles
    d. Wire strike protection
4. Structured programs to fully comply with manufacturers' recommended maintenance practices

This IHST global safety survey is intended to assess the progress toward full implementation of these practices within each industry sector in every region. While some of the recommended systems and equipment have mission specific application, the other recommendations for SMS, training and maintenance practices are universally applicable.

CONFIDENTIALITY: Your inputs will be kept confidential and will not be shared for advertising or marketing. The survey summary report will aggregate inputs by type of operation and use. Individual inputs will not be attributed to you or your company.

1. Email address:

2. Your type of organization related to helicopters (**Check only one**.)

Commercial operator	Private Operator	Manufacturer	Government regulator or safety organization
Corporate operator	Academia	Maintenance or service provider	Other
Government operator	Customer		

3. How does your company use or support helicopters (**Check only one** representing your main activity.)

Aerial observation	Emergency medical services	Logging
Agricultural application	External load	Offshore
Air taxi/charter	Firefighting	Personal/Private
Air Tours/Sightseeing	Instruction/Training	TV/Radio news gathering
Business aviation	Law enforcement	Utilities/Construction
Other		

4. Do you or your organization have a Safety Management System (SMS)?

5. Do you or your organization have a structured program for initial and recurrent training?

6. Do you or your organization use fully automated health & usage monitoring systems (HUMS)?

7. If you or your organization do **not** use fully automated systems for HUMS, do you have other systems for identifying exceedances (e.g., hot start, over-torque), monitoring engine power trends, checking oil samples, etc.?

8. Do you or your organization have a flight data monitoring (FDM) program

9. Do you or your organization use night vision goggles?

10. Do you or your organization use wire strike protection on your helicopter(s)?

11. Do you or your organization have a structured maintenance management system to fully comply with manufacturers' recommended practices?

12. Do you have any suggestions for getting more operators to adopt the IHST's key recommended practices?

Country of Operation (optional):

Your contact information (optional):

SMS: A safety management system (SMS) is a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. (ICAO). The key elements of an SMS are (1) Policy and Objectives, (2) Risk Management, (3) Assurance, and (4) Promotion. An SMS should be structured, documented and carried out in a fit-for-purpose way to assure that all risks are assessed and then continuously managed to a level as low as reasonably practicable.

Structured training program for initial and recurrent training: Initial and recurrent training should deliver specific competencies required for the missions to be flown. Training should have specific intentions and measure desired outcomes. For example, regarding instrument flight training, the recurrent training requirement should address the ability to successfully fly the approaches required for the mission (e.g., ILS) rather than a fixed amount of flying time in actual or simulated instrument flying conditions. All pilots should get recurrent training annually, including practice of emergency procedures, preferably in fit-for-purpose flight training devices or simulators.

Fully automated HUMS: With fully automated HUMS, sensors are placed at critical locations on helicopters to automatically monitor the health of mechanical components, as well as usage of the airframe and its dynamic components. HUMS record structural and transmission usage, transmission vibrations, rotor track and balance information, and engine power assurance data. HUMS monitor the health of rotating components such as gearboxes, bearings, shafts, engines, and rotors through vibration, and can also record parametric data from the aircraft's bus for usage and event analysis. HUMS can identify approaching equipment failure, enabling proactive maintenance and avoiding inflight emergencies.

"Manual HUMS": Even when helicopters are not equipped with automated systems for monitoring health & usage, operators can identify equipment problems before that equipment fails by manually monitoring certain parameters, recording data and noticing trends. Examples include engine start data, especially hot starts, power check data, and oil sampling.

FDM: Helicopter Flight Data Monitoring (HFDM) is a systematic method of accessing, analyzing, and acting upon information obtained from flight data to identify and address operational risks before they can lead to incidents and accidents. The information and insights provided by HFDM can also be used to reduce operational cost and significantly enhance training effectiveness and operational, maintenance, and engineering procedures. Information from HFDM programs is unique since it provides objective data that otherwise is not available. Low cost devices are available for all helicopter types. Support groups are available to help small operators or individual pilots manage an FDM program.

Structured maintenance management systems: All helicopter operators, including individual owner/operators need a fit-for-purpose system or framework to ensure that they can safely maintain their aircraft in airworthy readiness for operations a cost-effective manner. It is essential for all the stakeholders, including the owners, operators and their customers, to agree on how maintenance is to be done and to document that agreement to assure a shared understanding and consistent execution. The structured system for helicopter maintenance management should use the manufacturer's guidance as the baseline, assuring full compliance with the manufacturer's recommended maintenance practices and schedule.