USHST H-SE Status Update
May 1, 2018
Overview of active Helicopter Safety Enhancements (H-SE) – May 1, 2018

- Total of (21) Approved H-SEs of which, (16) have been officially started. Listed below are the active H-SEs.
- Each H-SE has a different schedule for completion.

<table>
<thead>
<tr>
<th>Group</th>
<th>H-SE No.</th>
<th>No. of Outputs</th>
<th>Months to Complete</th>
<th>Title</th>
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<tr>
<td>Outreach</td>
<td>19_A</td>
<td>3</td>
<td>22</td>
<td>Safety Culture and Professionalism</td>
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<td>Outreach</td>
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<td>Detection and Management of Risk Level Changes During Flight by Pilots and Nonflying Crew</td>
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<td>Outreach</td>
<td>28/112</td>
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<td>Helicopter Final Walk Around/Security of External Cargo</td>
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<td>Policy</td>
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<td>Develop/Publish ACS Rotorcraft-Helicopter Series</td>
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- The slides on the following pages show the status for each started Output for each active H-SE.
Implementation Status as of May 1, 2018

H-SE No.- Highlighted in red did not report status this month: 28/112, 81, 115/128, 117, 122

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<tr>
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</table>

**Status Color Key:**
- Green on target
- Yellow less than 10% behind target
- Red greater than 10% behind target
- Blue is completed

**Calendar Key:**
- The numbers under the calendar indicate the Output number.
- Most Outputs are scheduled to start at the beginning of the month.
- However there are a few that start mid-month and end mid-month. These are identified with a 0.5 in there start and end months. (Example: Output 1 of H-SE 81 started 9.15.2017 and ended 11/15/2017. And Output 2 of 81 started 11/15/2017.)
Overview of H-SE Status

- 16 Active H-SEs
  - Output 1 (16)
  - Output 2 (8)
  - Output 3 (2)

Status shown by all Outputs together

Note: Yellow is less than 10% behind schedule
Group: Outreach (5 Total H-SEs) – 3 Outreach H-SEs are Active

- H-SE 19A is on target (green) – “Safety Culture and Professionalism”
- H-SE 22A is behind target (red) – “Detection and Management of Risk Level Changes During Flight by Pilots and Nonflying Crew”
  - Output 1 is behind target (red)
  - Output 2 is ahead of target (green)
  - Output 3 is ahead of target (green) – scheduled to start May 1st, 2019
H-SE 19A – Safety Culture and Professionalism

Focal: Tony Malinaro (Tony.Molinaro@faa.gov)

- **Output 1:**
  1. 100% complete (blue)
  2. Define safety culture in terms of the individual operator or mechanic (include single pilot, single mechanic, and operation specific considerations).

- **Output 2:**
  1. 15% complete (green)
  2. Promote definition of “effective safety culture” as defined in Output 1 of this H-SE.

- **Actions:**
  1. Using a variety of media, USHST Outreach Team will promote day-to-day safety culture to the rotorcraft community, as defined by Output 1.
  2. Promotional outreach may vary in approach from publications on the USHST website and social media, to magazines/news, to public presentations at regional events such as FAAST seminars or large gathering events such as HAI’s annual Heli Expo.

- **Status:**
  1. The publicity and mentoring aspect of this Safety Enhancement will be accomplished through the “Go Local” initiative and the “safety feedback” initiative.
  2. The team has developed a structure for “Go Local” events and are obtaining permission to use names, photos and videos regarding specific fatal accidents to be dissected and discussed at the events.
**H-SE 22A – Detection and Management of Risk Level Changes During Flight by Pilots and Nonflying Crew**

Focal: Steve Earsom ([stephen_earsom@fws.gov](mailto:stephen_earsom@fws.gov))

- **Output 1:**
  1. 30% Complete (red)
  2. Gather and review existing research materials on:
     a) How people make decisions in demanding, real world situations (naturalistic decision making).
     b) Crew resource management for applicability to rotorcraft operations.

- **Actions:**
  USHSTs Outreach Team and SEA Training Team to coordinate with academic institutions on gathering and reviewing existing research regarding decision making and crew resource management that may be useful in developing recommended practices.

- **Status:**
  Team members are reviewing literature compiled to date. ERAU will be beginning a complementary literature search/review over the summer.
H-SE 28/112 – Helicopter Final Walk Around
/Security of External Cargo

Focal: Keith Cianfrani (kcianfrani@safety4pilots.com)

- **Output 1:**
  1. 75% complete (red)
  2. Review data regarding inadequate aircraft inspection.

- **Actions:**
  1. USHST SAT to compile briefing on fatal accidents raising aircraft inspection concerns.
  2. USHST SAT to review briefing with the HAI SC.

- **Status:**
  1. We conducted a review of accidents regarding this SE and discussed it at our recent HAI safety committee meeting. We are continuing the information gathering and have identified best practices from the industry and audits that I conduct on various operators. Our team will be looking to finish the accident review in the next few weeks to support our findings and recommendations.
  2. **Output 2:** (40% complete) We are in the process of developing recommendations and guidelines for pre-flight inspections.
  3. **Output 3:** (30% complete) We are currently developing an outreach program with the help of the various organizations that myself and others are involved with. We intend to use PPT and Webinars to promote our recommendations. I also intend to publicize our results with Rotor and Wing Magazine, Rotor Magazine, and Vertical Magazine.
Group: Policy (2 Total H-SEs) – 1 H-SEs is Active

- H-SE 30 is slightly behind Target (yellow) – “Develop/Publish ACS Rotorcraft-Helicopter Series”
- H-SE 37 is Not Active – “Add Progressive Approach to Training Autorotations to Helicopter Flying Handbook”
H-SE 30 – **Develop/Publish ACS**  
**Rotorcraft-Helicopter Series**

**Focal: Jim Ciccone** ([James.Ciccone@faa.gov](mailto:James.Ciccone@faa.gov))

**Output 1:**
1. 10% complete *(yellow)*
2. Develop new ACS for Rotorcraft-Helicopter series to replace the current PTS.

**Actions:**
1. If not already completed, add agenda item for the ARAC - ACS WG quarterly meeting, to introduce new helicopter industry participants and discuss efforts and roles within the WG for the new ACS.
2. Establish timelines and address progression of each ACS.
3. Conduct review of each helicopter ACS and address comments and required changes before release to industry.

**Status:**
1. The Rotorcraft Airman Certification Standards (ACS) Working Group (WG) continues to meet weekly via Telcon and Adobe Connect.
2. All Area of Operations, Tasks and Elements have been developed for the Private Rotorcraft ACS and the WG has moved onto reviewing and editing its Appendices.
3. The Rotorcraft WG has decided make the Private Rotorcraft-Helicopter ACS a stand-alone document from the Private Rotorcraft-Gyroplane ACS. The WG believes that this will make using the new Rotorcraft ACS document easier to use for Airman, Flight Instructors and Evaluators during training and testing.
4. AFS-810 is currently in the process of separating the two Draft Rotorcraft ACS documents.
Group: Tech & Equip (7 Total H-SEs) – 4 H-SEs are Active

- H-SE 70 is behind target (red) – “Stability Augmentation System (SAS) / Autopilot”
- H-SE 81 is behind target (red) – “Improve Simulator Modeling for Outside-the-Envelope Flight Condition
- H-SE 82 is on target (green) – “Helicopter Flight Data Monitoring”
- H-SE 91 is on target (green) – “Enhanced Helicopter Vision System”
H-SE 70 – *Stability Augmentation System (SAS) / Autopilot*

Focal: Ray Debs (rayd@helitrak.com)

- **Output 1:**
  100% complete - USHST to coordinate formation of H-SE 70 team

- **Output 2:**
  1. 50% complete *(Red)*
  2. Meet with FAA regarding certification pathways for SAS/autopilot technology for light helicopters.

- **Actions:**
  1. H-SE 70 team to coordinate meeting with FAA – Rotorcraft Standards Staff to:
     a) Describe the need for a SAS/autopilot system for light helicopters to FAA
     b) Describe SAS/autopilot system safety benefits to FAA
     c) Discuss potential paths for certification. Key points should include any potential NORSEE path, how to ensure maximum relief from DO178/254, and best path for reduced certification burdens from FAA.

- **Status:**
  1. Working on preliminary white paper for upper level USHST.

- **Issues:**
  1. Only 3 people active in group now. Need more people to contribute.
H-SE 81 – Improve Simulator Modeling for Outside-the-Envelope Flight Conditions

Focal: Ryan Mason (ryan@heliweb.com)

• **Output 1:**
  1. 80% complete (red)
  2. Form H-SE 81 team.

• **Actions / Status (No description of work complete):**
  1. USHST to convene team of subject matter experts to support H-SE 81.

• **Output 2:**
  1. 0% complete (red)
  2. Coordinate with the FAA, industry, and academia to review existing helicopter simulator/physics-based models and conduct research/testing to develop recommendations for improved helicopter mathematical/physics-based models.

• **Actions / Status (No description of work completed):**
  1. H-SE 81 to lead review of current simulator/flight training device models for fidelity and gaps in model data for outside-of-the-envelope flight regimes (e.g., Hover, Quick Stop, LTE, VRS, Autorotations).
  2. Collect simulation data from various simulator/training devices, helicopter types, and operators (e.g., Flight Safety, CAE, ELITE, FRASCA, X-Plane, Microsoft Flight Simulator, etc.) and flight test data from operators performing candidate maneuvers across various mission segments.
  3. Use data to develop recommendations for improved mathematical/physics-based flight dynamics simulator models. Test improved mathematical/physics-based flight dynamics simulator models as applicable and feasible.
**Focal:** Jeff Byrd (jbyrd@eit.com) (Cliff Johnson alternate)

**Output 1:**
1. 30% complete (green)
2. Develop an educational outreach campaign that address the following:
   a) Fundamentals of why the use of data recording devices is valuable to an owner/operator (What is HFDM? How can it be used? How is it part of an effective SMS?).
   b) Specific examples of the benefits to using HFDM as described by success stories of those who were early adopters.
   c) How data recording can work side by side with participation in voluntary safety programs such as Aviation Safety Information Analysis and Sharing (ASIAS) and provide information back to the owner/operator on trends and higher risk areas.

**Actions:**
1. USHST Outreach Team review current industry materials describing HFDM (i.e., Fact Sheets, Toolkits, etc.) from USHST/IHST, Global HFDM Steering Group, Rotorcraft ASIAS HFDM research, etc. and develop modifications for new materials and media types (i.e., audiovisual, mobile app, etc.) for the educational outreach campaign.
2. USHST Outreach team work with the FAA, ANG-E2 to conduct HFDM Knowledge Sessions and safety seminars and outreach sessions at targeted events.
3. USHST Outreach Team and the FAA, ANG-E2 develop and implement a pilot program (i.e., similar to the General Aviation Demo Project) for expanding recorder usage among targeted helicopter mission segments.
4. The FAA and ANG-E2 collect helicopter flight test data from multiple helicopter types and mission segments for incorporation into ASIAS to demonstrate practical ASIAS capabilities to audiences during outreach.

**Status:**
1. Cliff has been busy doing outreach with the existing materials, plus posting a HFDM video to the USHST website.
2. Review of existing outreach materials is underway.
H-SE 91 – Enhanced Helicopter Vision System
Focal: Cliff Johnson (Charles.C.Johnson@faa.gov)

• Output 1:
  1. 45% complete (green)
  2. Research and evaluate helicopter vision-enhancing technologies and operational concepts for advanced vision systems.

• Actions:
  1. FAA – ANG-E2 should engage with industry to review the current vision systems enhancing technologies available and how compatible they may be with rotorcraft. A survey of industry vision systems manufacturers may be necessary as part of this effort. FAA – ANG-E2 should compile the results of this review in support of the FAA internal discussion described in Step 2.
  2. FAA – ANG-E2, AFS-400, AFS-800, and AIR-Rotorcraft Standards Staff should meet to discuss any existing operational and certification barriers (regulation, policy, guidance) that may have either discouraged or prohibited use of already available advanced vision technologies. These will be issues the FAA should resolve in Output 2.
  3. Following the FAA discussion from Step 2, if there are currently available vision systems enhancing technologies that could be accepted and installed by the rotorcraft community without significant action necessary by the FAA, this type of technology should be promoted immediately and not delayed by further study (skip to Output 3, “promotion”). However, if options are limited and further study is required, FAA – ANG-E2 should do the following:
     a) Conduct a study on pilot performance and human factors aspects of vision-enhancing system displays via flight testing.
     b) Conduct a study on vision systems’ sensor technologies and performance via flight and ground testing.
     c) Examine obstacle-detection capabilities with vision systems technologies (i.e., wire detection with FLIR, LIDAR, MMWIR, etc.).
  4. At the conclusion of this output, FAA- ANG-E2 should develop a report on operational concepts for utilization of helicopter vision-enhancing systems in low-visibility operations (i.e., night, IMC, etc.) and enhanced VFR.

• Status:
  1. FAA members of the Vision Systems H-SE Team continued to test a new EVS IR sensor that we tested in low-visibility conditions and terrain during the week of Apr. 16, 2018.
  2. The team completed an update for a flight test plan to focus on human factors aspects and continued compiling a sensor/display product technology review of various vision enhancing technologies on the market today.
  3. The team continued planning for additional EHVS flight tests with Search-and-Rescue (SAR) and Helicopter Air Ambulance (HAA) operators to evaluate the technologies that are out there currently.
**Group: Training (8 Total H-SEs) – All H-SEs are Active**

  - Output 1 is slightly behind target (yellow)
  - Output 2 is ahead of target (green)
- H-SE 116 is on target (green) – “Improve Make/Model Transition Training”
- H-SE 117 is on target (green) – “Competency-based Training and Assessments in Initial Pilot Training”
- H-SE 122 is behind target (red) – “Recommended Practices for Standardization of Autorotation and Emergency Aircraft Handling Training”
Group: Training (8 Total H-SEs) – All H-SEs are Active – cont.

- H-SE 123 is on target (green) – “Increased Simulation/Education to Develop Safe Decision Making”
- H-SE 124 – “Improve Understanding of Basic Helicopter Aerodynamics”
  - Output 1 is slightly behind target (yellow)
  - Output 2 is ahead of target (green)
- H-SE 125 is behind target (red) – “Pre-flight risk assessment for student flights”
- H-SE 127A is behind target (red) – “Training for Recognition/Recovery of Spatial Disorientation”
H-SE 115/128 – Threat and Error Management for Initial and Recurrent Pilot Training

Focal: Ed Stockhausen (estockhausen@metroaviation.com)

- **Output 1:**
  1. 30% complete (green)
  2. Develop recommended practices for incorporating TEM into initial and recurrent helicopter training.

- **Actions:**
  1. FAA, USHST SEA Training Team, and HAI TC to review existing materials on teaching TEM.
  2. FAA, USHST SEA Training Team, and HAI TC to develop recommendations for implementing TEM in initial and recurrent helicopter pilot training. In completing this work, the group should examine TEM within the context of the LOC-I, UIMC, and LALT fatal accidents analyzed by the USHST working group to guide their recommendations.
  3. FAA, USHST SEA Training Team, and HAI TC to issue recommendations.

- **Status:**
  1. Distributed CASA TEM training materials for review and discussion. Conference call planned for week of April 9th.

- **Output 2:**
  1. 25% complete (green)
  2. Revise Advisory Circular (AC) 60-22, Aeronautical Decision Making (or issue new AC, as appropriate) to incorporate TEM recommendations.

- **Actions:**
  1. FAA to incorporate TEM recommendations in AC 60-22, as appropriate, or issue a new AC.
**Output 1:**
1. 65% complete (green)
2. Review best practices and recommendations related to transition training developed and published by other organizations (e.g., AOPA, EAA, GAJSC) and use these materials to create updated and unified recommendations regarding transition training in helicopters.

**Actions:**
1. USHST SEA Training Team will review existing best practices and recommendations related to transition training. They should request assistance as needed from HAI TC, AOPA, EAA, GAJSC, or any other industry organizations that may have experience developing transition training.
2. USHST SEA Training Team will draft standardized guidelines for transition training to include a gap analysis template for CFIs. The gap analysis template will allow CFIs to identify highest risk areas for pilots of various experience levels transitioning to a different helicopter type.
3. USHST SEA Training Team will review their draft proposal with insurance underwriters for final edits (consider using NBAA to establish connection, if needed).
4. USHST SEA Training Team will publish the transition training toolkit.

**Status:**
1. Reviewing training what training programs are being offered on specific airframes for improving pilot familiarity and proficiency.
2. Plans moving forwards are to highlight the benefits of attending specific make & model training on a semi-annual / annual basis.

**Issues:**
1. As we hate to see Steve leave, we wish him the best in his new endeavors.
2. New focal not yet identified.
H-SE 117 – Competency-based Training and Assessments in Initial Pilot Training

Focal: Nicky Armour (narmour@mitre.org)

- **Output 1:**
  1. 50% complete (green)
  2. Convene H-SE 117 Subject Matter Expert (SME) team to define pilot competence for the list of subject areas noted in this H-SE.

- **Actions:**
  1. USHST SEA Training Team and the FAA to conduct outreach to convene a team of SMEs to define competency in list of subject areas noted in this H-SE.
  2. H-SE 117 SME team to establish a team lead, define roles, and establish a meeting schedule.

- **Status:**
  1. No description of work completed
H-SE 122 – Recommended Practices for Standardization of Autorotation and Emergency Aircraft Handling Training

Focal: Chris Horton (cjhorton86@gmail.com)

Output 1:
1. 0% complete (red)
2. Define an H-SE 122 SME team, composed of subject matter experts from Training Industry and led by the USHST SEA Training Team.

Actions:
1. USHST SEA Training Team to connect with HAI TC to formulate team participants.
2. Establish ownership of efforts and roles within team.
3. Establish initial meeting with participants to outline further objectives and meeting schedule.

Status:
1. No description of work completed

Output 2:
1. 0% complete (red)
2. Draft a White Paper documenting the consensus on recommended training practices for Certified Flight Instructor-Rotorcraft/Helicopter with focus on areas defined in the Statement of Work and develop an online database of resources when the draft is complete.

Actions:
1. Compile and review existing resources.
2. Define structure of White Paper:
3. Cont.....
H-SE 123 – *Increased Simulation/Education to Develop Safe Decision Making*

**Focal:** Nick Mayhew ([nick.mayhew@L3T.com](mailto:nick.mayhew@L3T.com))

- **Output 2:**
  1. 10% complete *(green)*
  2. H-SE 123 SME team will work to eliminate any barriers in existing guidance and oversight that may currently inhibit or discourage increased use of helicopter simulation devices. The specific intent is to prevent future fatal accidents by enabling a greater number of pilots to be safely educated on at risk scenarios at all levels of simulator training.

- **Actions:**
  1. The H-SE 123 SME team will conduct a full review of guidance and oversight for all helicopter simulation in the U.S. The team should provide recommendations to the FAA on the necessary revisions to guidance and oversight that would allow as much simulator training and checking credit as possible. If the recommendations are implemented, they would serve to promote increased use of simulation for at risk scenarios.
  2. If necessary, the USHST SAT can brief the H-SE 123 SME team on the LOC-I, UIMC, LALT analysis and scoring process that led to the prioritization of this particular H-SE. (Cont…..)

- **Output 3:**
  1. 10% complete *(green)*
  2. Work with industry to identify specific at risk scenarios, address the feasibility of their inclusion or further emphasis in simulator training for both ab initio and recurrency sessions, promote their inclusion, and recommend how the most recently identified at risk scenarios can continue to be routed to the simulator training providers..

- **Status:**
H-SE 124 – Improve Understanding of Basic Helicopter Aerodynamics

Focal: Tim Tucker (pilottucker@earthlink.net)

- **Output 1:**
  1. 20% complete *(yellow)*
  2. Review the Helicopter Flying Handbook (FAA-H-8083-21A), Helicopter Instructor’s Handbook (FAA-H-8083-4) and pertinent ACs to assess explanations of unsafe aerodynamic situations and provide recommendations for revisions.

- **Actions:**
  1. The FAA, USHST SEA Training Team, and HAI Training Committee to collaborate on recommendations for revising the content in the Helicopter Flying Handbook and Helicopter Instructor’s Handbook concerning unsafe aerodynamic situations.

- **Output 2:**
  1. 20% complete *(green)*
  2. Revise to the Helicopter Flying Handbook, Helicopter Instructor’s Handbook and pertinent ACs concerning unsafe aerodynamic situations, to include vortex ring state, low G mast bumping, and low RPM rotor stall guidance.

- **Actions:**
  1. The FAA should use the recommendations from Output 1 to initiate and complete revisions to the Helicopter Flying Handbook, Helicopter Instructor’s Handbook and pertinent ACs.

- **Status:**
  1. The ACS Working Group is just finishing the first draft of the Private Helicopter Airman Certification Standards (ACS). The guidance, namely the Helicopter Flying Handbook, will follow completion of the ACS.
H-SE 125 – Pre-Flight Risk Assessment For Student Flights

Focal: Chris Young (cbyoung.email@gmail.com)

- **Output 1:**
  1. 25% complete (red)
  2. Review existing flight training pre-flight risk assessment material, identify gaps between recommended practices and findings from USHST fatal accident analysis, and consolidate recommended practices.

- **Actions:**
  1. USHST SEA Training Team to review existing material from sources listed in the “Relation to Current Aviation Community Initiatives”, for Pre-Flight Risk Assessments.
  2. Identify gaps between reviewed material and findings from USHST fatal accident analysis.
  3. Identify inherent risks associated with the flight training environment.
  4. Consolidate findings and recommendations into a format conducive to developing guidance.

- **Status:**
  1. Continue to evaluate industry options for types of pre-flight risk assessments and identifying gaps.
  2. Connecting with USHST SEA Team for assistance and verification of action assignments.
H-SE 127A – Training for Recognition/Recovery of Spatial Disorientation

Focal: Bryan Smith (Safety@alea.org)

- **Output 1:**
  1. 20% complete (red)
  2. Review existing SD training products for inclusion in helicopter specific SD training.

- **Actions:**
  1. Research and review current SD products available (GAMA facilitate via survey).
  2. USHST SEA Training Team will review GAMA survey results to determine if current materials meet needs.
  3. If USHST Special Areas Training Team finds current materials are inadequate, they will create a requirements document to define unmet needs. This may involve outreach to simulator providers or other research entities.

- **Status:**
  1. H-SE has been stalled for the month of April. No progress made during the month of April.
  2. The team will restart over the next week and start working towards identifying the training resources that do not include important spatial disorientation information and drafting what information we recommend should be included.
  3. The team would like to start arranging for the FAA’s SD sim to appear at events like Heli Expo, etc.

- **Issues:**
  1. Focal sent an email out to team and asked who was still interested in working on the project. Only two people responded.
• **Next H-SE to start June 1, 2018**
  • H-SE 13A – “Utilities Patrol and Construction (UPAC) Recommended Practice Guide”
    • Focal: Ron Steward
  • H-SE 37 – “Add Progressive Approach to Training Autorotations to Helicopter Flying Handbook”
    • Focal: Shawn Coyle
  • H-SE 75 – “Technology to Prevent Unintended Loss of Engine Power”
    • Focal: Not assigned yet
  • H-SE 90 – “Use of UAS or OPA in High Risk Environments/Operations”
    • Focal: Mark Colborn
  • H-SE 130 – “Education and Simulation on Hazards of Over-The-Counter Medication”
    • Focal: Richard Martinez