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HELICOPTER HOIST OPERATION PILOT TRAINING GUIDE - V 1.0



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Preamble:

Helicopter Hoist Operations are considered as a full crew mission concept where responsibilities and leadership change within the crew throughout the completion of the mission.

During the flight, Pilots, Hoist Operators, Rescuers, Medical Personnel and other human external cargo (HEC) are identified as a group of interdependent individuals working together to complete a specific task. The Crew, considered as a team, must depend on each other's knowledge, skills, and competence to achieve the same goal.

This document, which is focused for Helicopter Hoist Operation Pilot(s), aims to highlight on the different training phases of the Pilot. Considering the interactions with other crewmembers and specificities of the mission, it must cover essential aspects of Helicopter Hoist Operation including, but not limited to, normal and emergency procedures, Crew Resources Management, Airmanship etc....

This training guide does not contradict the AIR OPS regulation (EU) 965/2012, which remains the reference document for this kind of operation. The present document is a recommended guideline to create a competence-based training scenario for pilots, not adding requirements, but rather helping the operators to comply with existing regulations.

This training guide is not legally binding; it was developed by a group of experienced hoist pilots and hoist operators and therefore it should be regarded as a role model.

Helicopter Hoist Operations are very challenging and bear certain risks. In order to enhance safety and efficiency, a proper pilot training dedicated to hoist operations pilot shall be promoted and stimulated within the industry.

“The European Plan for Aviation Safety (EPAS), includes since 2019 a Safety Promotion Task (SPT) covering Helicopter Hoist Safety Promotion. This present Helicopter Hoist Operation Pilot Training Guide is the second training guide delivered by the ESPN-R Hoist Safety Promotion Working Group, following the issuance of the Hoist Operator Training Guide in 2021. Both training guides are deliverables to the EPAS SPT.0099.”

SPO.SPEC.HEC activities are not considered in this document, as SPO.SPEC.HEC regulations are different from SPA.HHO and adaptations would be necessary.

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ANNEX 01 SYLLABUS

1 INTRODUCTION

The ESPN-R Hoist Safety Promotion working group would like to support the growing Helicopter Hoist Operations market (HEMS, offshore wind energy, etc.) and address a potentially operational safety risks and an increasing number of occurrences, by creating a pilot training guide in order to increase safety in hoist operations of all types.

National authorities, OEM (*Original Equipment Manufacturers*) and ATO (*Approved Training Organization*) have been associated with this initiative to define clearly training and checking requirements.

In addition, to avoid confusion with other ESPN-R working groups and activities, this document will only cover pilot prerequisites, training, checking and assignment into duties and will not cover the peculiarities of HEMS and NVIS. However, the Hoist Safety Promotion working group recommend making the exchange of information between the different working groups easier.

In conclusion, by promoting advanced, improved and accurate sets of skills for pilots, it will necessarily improve safety and efficiency of Helicopter Hoist Operations.

The ESPN-R hoist working group recommends that trainee hoist pilot and trainee hoist operator to be trained separately to ensure the most efficient training.

Due to the complexity of both tasks, simultaneous training can quickly turn into negative training for both if not properly coordinated by the instructors.

Therefore, the instructor pilot and the hoist operator instructor must be experienced, trained and collaborate effectively.

The aim is to ensure a high level of proficiency to the trainee hoist pilot without compromising safety.

Regardless of whether separate or combined training is used for the trainee hoist pilot and the trainee hoist operator, an appropriate risk assessment should always be conducted prior to training.

A risk assessment for a HHO should systematically identify, evaluate and mitigate potential risks.

To carry out such, the tool established in the organization of the relevant AOC holder performing the training should be used, provided it has been adapted to the needs of helicopter hoist operations.

This training guide does not include or replace a risk assessment. Nevertheless, if no suitable tool is available in this organization, the ESPN-R hoist working group recommends the use of the following aids and information:

EHEST Pre-departure Risk Assessment Checklist | EASA (europa.eu)

<https://www.easa.europa.eu/en/downloads/23352/en>

Airbus Helicopters has developed a Flight Risk Assessment App (Before Your Flight) available free of charge to anyone, customers and non-customers. Sustaining and update services are also provided free of charge through the Apple and Android stores. (Contact: contact.aviationsafety.ah@airbus.com).

Leonardo Helicopters has developed a mobile solution called SkyFlight, which is available for free on the Apple App Store, which is ideal for use on iPads. A SkyFlight App compatible with Android is also available, but is limited to Risk Assessment (only). (Contact: Skyflight.support@leonardocompany.com).

Proposal for a mitigation measure based on the experience of the pilot to be trained and the HHO-Technical Crewmember experience:

The following evaluation tables can be used to develop a mitigation measure based on the experience of the HHO pilot and the HHO-TC being trained.

Table 1 – Determination of experience level. The trainees' experience values are converted into an index. The more experience, the larger the index. The aim is to obtain comparable referencing.

Table 2 - Indicator Matrix. Determination of the percentage of joint training (pilot trainee and HHO-TC trainee with their respective trainers).

Table 3 – Example with 50 Cycles is used to show how many cycles can be trained together in a training scope of 50 cycles. This means pilot trainee and HHO-TC trainee with their respective trainers.

Evaluation matrix of joint training pilot & HEMS-TCM

The ESPN-R hoist working group recommends that trainee hoist operators and trainee hoist pilots be trained separately to ensure the most efficient training for each job. Nevertheless, it may be possible with an adequate risk assessment to perform a joint training with pilot and HEMS-TCM by means of applying the risk methodology below.

| Pilot Experience flight hours TOTAL* | Indicator | HHO-TC Experience flight hours TOTAL** | Indicator |
|--|-----------|--|-----------|
| <250 hrs. | 1 | <25 hrs. | 1 |
| 251 – 500 hrs. | 2 | 26 – 50 hrs. | 2 |
| 501 – 750 hrs. | 3 | 51 – 75 hrs. | 3 |
| 751 – 1000 hrs. | 4 | 76 – 100 hrs. | 4 |
| > 1001 hrs. | 5 | > 101 hrs. | 5 |

*incl. 20 hrs. on type


**incl. 5 hrs. on type

Table 1 – Determination of experience level

Indicators are specified by the matrix, but should also be verified by the training organization and, if necessary, adapted to the evident experiences.

| Indicator | | HHO-TC trainee | | | | |
|---------------|---|----------------|------|------|------|-------|
| | | 1 | 2 | 3 | 4 | 5 |
| Pilot trainee | 1 | 0 % | 5 % | 10 % | 15 % | 20 % |
| | 2 | 20 % | 25 % | 30 % | 35 % | 40 % |
| | 3 | 40 % | 45 % | 50 % | 55 % | 60 % |
| | 4 | 60 % | 65 % | 70 % | 75 % | 80 % |
| | 5 | 80 % | 85 % | 90 % | 95 % | 100 % |


Table 2 - Indicator Matrix

Example 1 

Pilot 530 hrs. flight experience → indicator: 3

HHO-TCM 52 hrs. flight experience → indicator: 3

Result: 50% of the training can be completed jointly

Example 2 


Pilot 780 hrs. flight experience → indicator: 4

HHO-TC 5 hrs. flight experience → indicator: 1

Result: 60% of the training can be completed jointly

Note: Sufficient / relevant experience, beforehand assessment flight to be performed

Table 3, Example with 50 cycles

| | |  HHO-TC trainee | | | | |
|---------------|----|--|----|----|----|----|
| Cycles: | 50 | 1 | 2 | 3 | 4 | 5 |
| Pilot trainee | 1 | 0 | 2 | 5 | 7 | 10 |
| | 2 | 10 | 12 | 15 | 17 | 20 |
| | 3 | 20 | 22 | 25 | 27 | 30 |
| | 4 | 30 | 32 | 35 | 37 | 40 |
| | 5 | 40 | 42 | 45 | 47 | 50 |

Note: ESPN-R Hoist Safety Promotion led a similar action for Hoist Operator and the Hoist Operation Pilot Training Guide shall be attached to the “Hoist Operator Training Guide” already issued to create an enhanced document for HHO.

The ESPN-R hoist working group recommends, if available, simulation devices like FSTD’s. It may increase safety and efficiency and reduce the environmental impact.

The training program shall be completed within a reasonable time for training efficiency.

If organizations have no experience on hoisting operations, ESPN-R recommends to utilize external support by experienced and skilled trainers. A risk assessment has to be conducted prior starting the training.

NOTE: It is recommended, to perform the pilot training in environments and at heights and locations, that are realistic of actual / foreseen scenarios and tasks to be operated.

NOTE: The ESPN-R hoist working group is developing a training guideline for simulation on hoist operation, which may be considered to be consulted for future reference.

2 LIST OF ABBREVIATIONS

| | | | |
|--------|--|-------|--|
| AEO | All Engines Operative | OEM | Original Equipment Manufacturers |
| AMC | Acceptable Means of Compliance | OM | Operational Manual |
| ARS | Air Rescue Specialist | ORO | Organization Requirements for Air Operations |
| ATO | Approved Training Organization | PCDS | Personnel-Carrying Device System |
| CAT | Commercial Air Transport | PF | Pilot Flying |
| CCC | Crew Coordination Concept | PIC | Pilot in Command |
| CRM | Crew Resource Management | PICUS | Pilot in Command under Supervision |
| EASA | European Aviation Safety Agency | PM | Pilot Monitoring |
| EPAS | European Plan for Aviation Safety European Safety Promotion | PPE | Personnel Protective Equipment |
| ESPN-R | Network - Rotorcraft | RFM | Rotorcraft Flight Manual |
| EU | European Union | SERA | Standardized European Rules of the Air |
| FC | Flight Crew | SOP | Standard Operating Procedure |
| FRAT | Flight Risk Assessment Tool | SP | Single Pilot |
| FSTD | Flight Simulation Training Device | SPA | Specific Approvals |
| GM | Guidance Material | SPEC | Specification |
| HEC | Human External Cargo | SPO | Specialized Operations |
| HEMS | Helicopter Emergency Medical Service | T/O | Takeoff |
| HHO | Helicopter Hoist Operation | TBC | to be confirmed |
| LDG | Landing | TBD | to be determined/defined |
| MCC | Multi Crew Concept | TC | Technical Crew |
| MP | Multi Pilot | TCM | Technical Crew Member |
| NHEC | Non-Human External Cargo | TEM | Threat and Error Management |
| NVG | Night Vision Goggles | TRI | Type Rating Instructor |
| NVIS | Night Vision Imaging System | VFR | Visual Flight Rules |
| OEI | One Engine Inoperative | | |

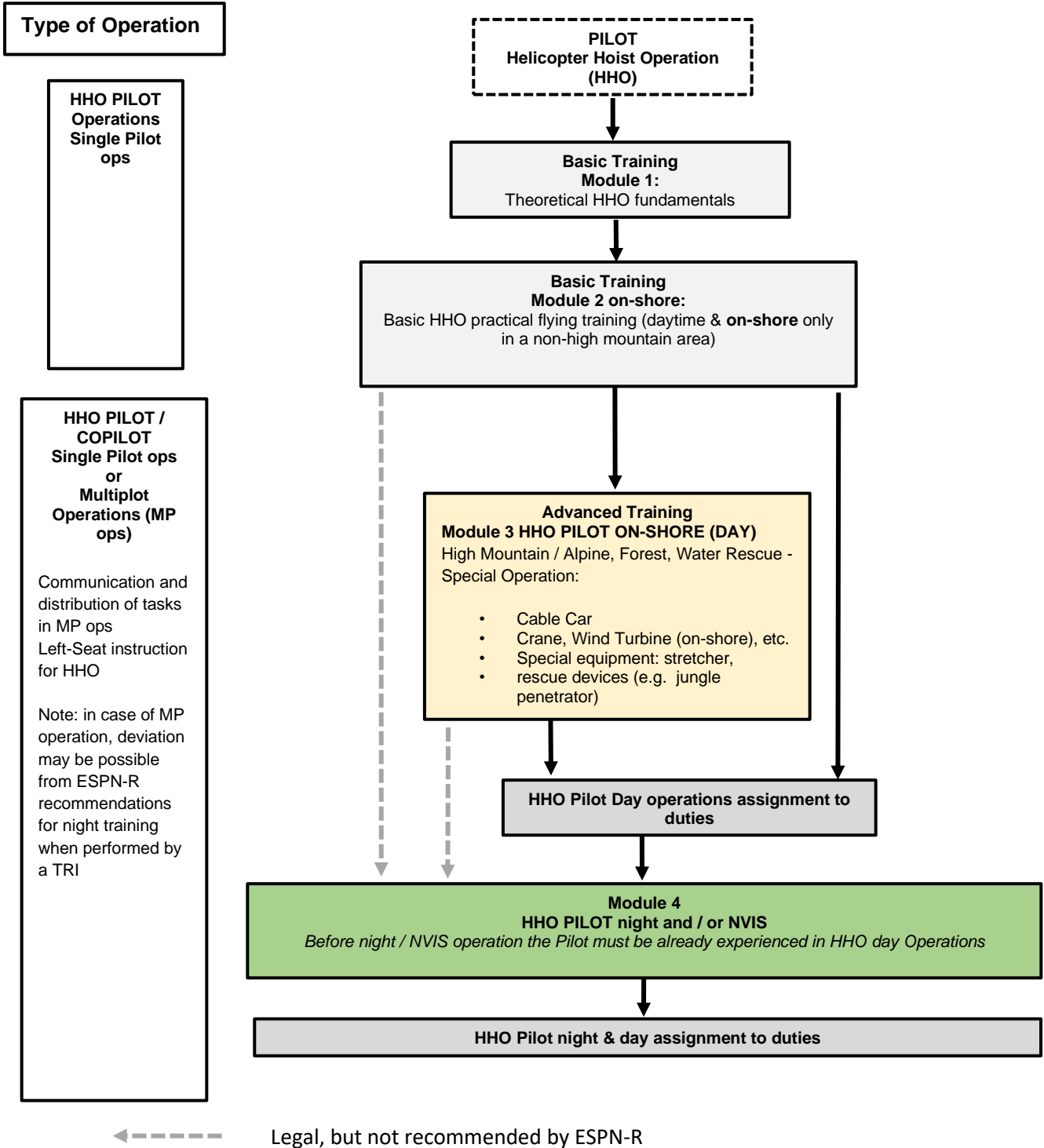
3 SOURCES

- *Regulation EU 1139/2018 including annex V (essential requirements for air operations)*
- *(EU) 965/2012 on Air Operations*
- *Standardized European Rules of the Air (SERA) regulation (EU) No 923/2012.*
- *EASA Concept Paper Making the Case for Helicopters in Evidence Based Training*
RMT.0599 – Update of ORO.FC
- *Other recommendation for example*
 - *“Meaningful and effective training of a pilot for HHO mission (Klaus Hopf)*

4 HELICOPTER HOIST OPERATION PILOT

HELICOPTER HOIST OPERATION PILOT (on-shore)

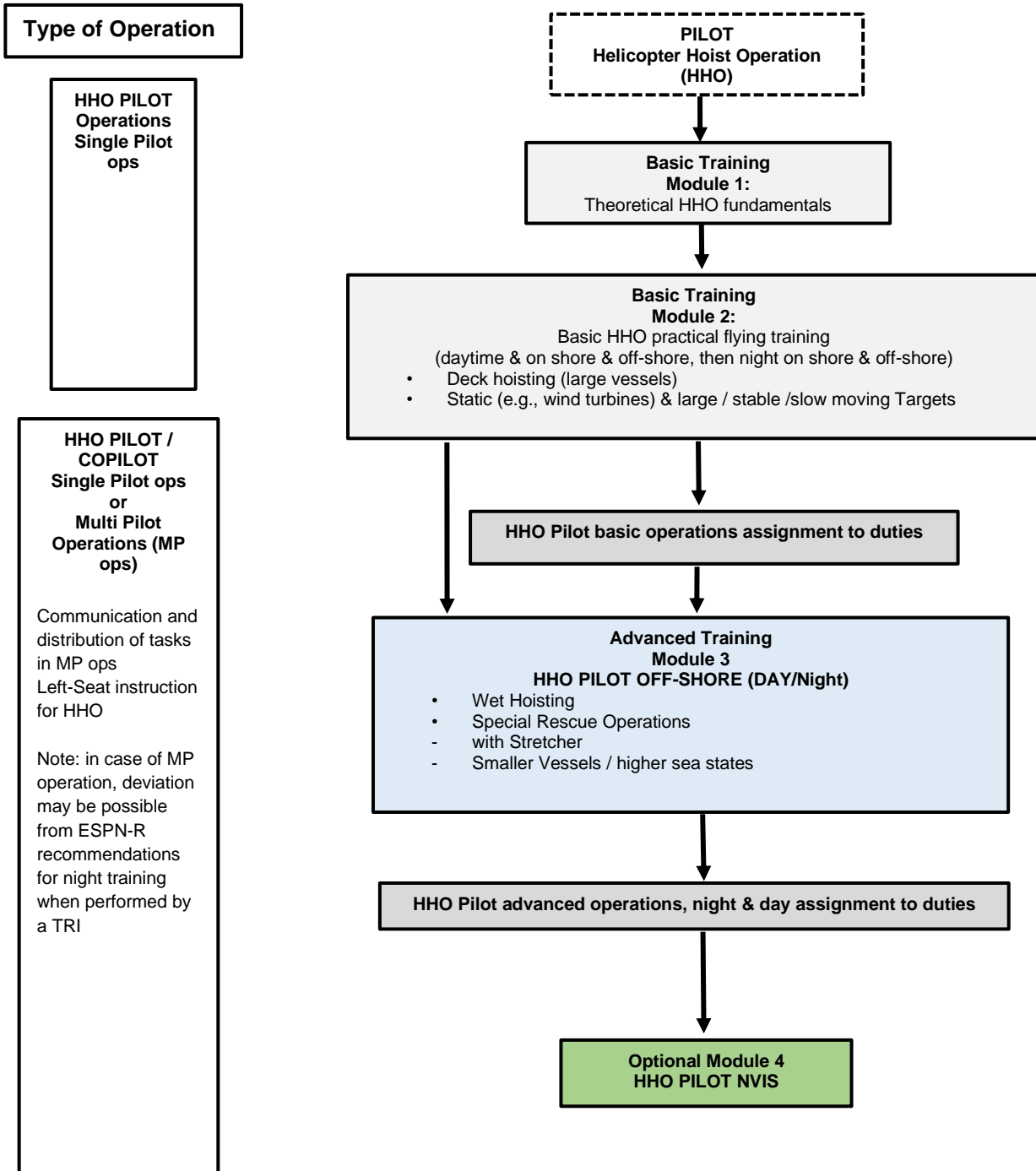
Considering the already existing EASA set of regulations and the ESPN-R Hoist Operation Safety recommendations



NOTE: an experienced off-shore hoist pilot, becoming an on-shore hoist pilot has to undergo the same steps of the training (flow chart), but each step may require less effort to complete.

HELICOPTER HOIST OPERATION PILOT (off-shore)

Considering the already existing EASA set of regulations and the ESPN-R Hoist Operation Safety recommendations



NOTE: an experienced on-shore hoist pilot, becoming an off-shore hoist pilot has to undergo the same steps of the training (flow chart), but each step may require less effort to complete.

The ESPN-R Hoist Promotion Group suggest and recommend an effective “modular” way to train pilots for Helicopter Hoist Operation (HHO).

Note:

- SPA.HHO.130 (a): The operator shall establish criteria for the selection of flight crew members for the HHO task, taking previous experience into account.
- The Crew training programs shall improve knowledge of the HHO working environment and equipment; improve crew coordination; and include (not limited to) measures to minimize the risk associated with HHO normal and emergency procedures (*EASA Air Ops (EU) 965/2012*).

Note:

Existing regulation (EU) 965/2012 on Air Operations (SPA-HHO.130 (d)) specifies that a hoist cycle shall include a transition to and from the hover. Ideally, one hoisting down and up of the hook with either delivering or picking up NHEC or HEC to or from a surface (land, sea, deck, raft etc....)

4.1 Prerequisites for HHO Pilot

The minimum requirements as written in (EU) 965/2012 SPA.HHO.130 shall be respected by all European operators.

4.2 Module, 1 Basic Pilot HHO Training, Theoretical Fundamentals

Training objectives:

The trainee pilot will be provided with the information and instructions necessary to safely perform basic hoist operations in accordance with the requirements of the appropriate flight manual and hoist manufacturer’s operator manual.

The trainee pilot will be familiar with the theoretical hoist operation procedures under normal, abnormal and emergency conditions.

The definition of module 1 is developed considering ab-initio hoist pilot.

Prior to beginning the Basic Hoist Pilot (or HEMS, NVIS or multi crew) training, the pilot must be trained on the following topics:

Theoretical Fundamentals:

Training should include (not limited to) Human Factors subjects such as mission preparation, using flight risk assessment tools (e.g. FRAT) and mitigation (TEM – Threat and Error Management) , briefings / debriefings, procedures and check lists, verifications (checks, double checks and cross-checks), attitudes: How to avoid risk taking, normalization of violations, team pressure (clannish structure), and basic physiological and psychological factors (e.g. involved in being afraid of heights, spinning effects, if the trainee pilot - where possible/planned to be a hoist passenger for awareness purposes), occurrence reporting, etc.;

The requirements for the PIC in a hoist mission has to go far beyond the technical understanding of the hoist system, the operational process and the knowledge of standardized communication.

In addition to the above-mentioned requirements, the organizational and psychological skills of the commander are particularly challenged, especially during hoist operations.

This must be taken into account and integrated in training as far as possible.

In particular, hoist operations are generally characterized by information deficits, cooperation between different organizations, assessment of hazards, time- and psychological pressure, different evaluations of the situation and of the procedures to be used, etc.

After assessing all relevant factors and information within the crew, the commander must ultimately take a decision. He has to decide if and how the mission will be carried out and has to communicate this decision to the crew in a short and clear manner.

In order to be able to make the right decision under the conditions mentioned, there are various tools such as:

- Adequate Mission preparation
- Flight risk assessment tools "FRAT"
- Threat and error management "TEM"
- Using checklists
- Using verifications
- (...)

Multi flight crew may be developed as an add-on in a separate module at a later date.

NOTES: The following list is only an example of a theoretical syllabus for an initial pilot hoist-operation training and should not be considered as an exhaustive list!

All points listed are only to be taught if they contain a corresponding reference to the training objective (HHO-PIC) in each individual case, the respective operational and operative requirements/features must be considered.

The schedule below contains all, but not limited to, requirements as listed in AMC 1 SPA.HHO.130 (f)(1) "Crew requirements for HHO - Training and checking syllabus for flight crew training".

| Module 1 ¹ | Topics to be covered | Contents (not limited to) | Guideline for recommended duration of training | References |
|-----------------------|---|---|--|--|
| Theory 1.1 | <ul style="list-style-type: none"> Legislative framework | <u>EASA Specifications</u> <ul style="list-style-type: none"> Commission Regulation (EU) No. 965/2012 <ul style="list-style-type: none"> Annex III, Part ORO, Subpart FC “Flight Crew” Annex V, Part SPA, Subpart I “HHO” Annex VIII, Part SPO, Subpart E “SPEC”, Section 2 “Human External Cargo Operations” AMC’s and GM related to the mentioned Annexes National regulations (if applicable) | | Regulation (EU) 965/2012 on air operations |
| Theory 1.2 | <ul style="list-style-type: none"> Content of respective sections and supplement(s) in the Rotor Flight Manual (RFM) | <u>Hoist related content of the following FM-Sections:</u> <ul style="list-style-type: none"> “Limitations” “Performance” “Mass and Balance” Hoist System Flights with open/removed doors Flights with extended gross mass (if applicable) <u>Hoist related content of other assisting systems</u> <ul style="list-style-type: none"> Autopilot modes Stabilization Systems | | Respective RFM |
| Theory 1.3 | <ul style="list-style-type: none"> Content of respective sections and supplement(s) in the Rotor Flight Manual (RFM) | <ul style="list-style-type: none"> “Normal, Abnormal and Emergency procedures” | | Respective RFM |

| | | | | |
|---------------|--|---|--|--|
| Theory 1.4 | <ul style="list-style-type: none"> Content of hoist manufacturers operating manual | <ul style="list-style-type: none"> General Precautions System Description Operation procedures and hints Leading particulars (...) | | Hoist Manufacturers Operator Manual |
| Theory 1.5 | <ul style="list-style-type: none"> Content of the respective part of operator's OM / SOP's | <ul style="list-style-type: none"> Helicopter preflight preparation Required equipment / MEL Required PPE Required rescue personnel Required rescue equipment Minimum Flight crew Duties and responsibilities of Flight- and Technical Crew Members as well as the rescuers / HHO-passengers Operator specific minimum Performance for the intended mission (HEC /NHEC / Night) Minimum weather conditions Radio commands and hand signals Normal and emergency procedures | | Approved Operator Manual |
| Theory 1.6 | <ul style="list-style-type: none"> Knowledge about the hoist system (If not already done under 1.3) | <p><u>Leading particulars:</u></p> <p><u>Fixed provisions:</u></p> <ul style="list-style-type: none"> Electrical / hydraulic System Switches, Indications, circuit breakers and controls Activating and Deactivation the system Attachment points | | Hoist Manufacturers Training Manual Helicopter Manufacturers System Descriptions |

| | | | | |
|---------------|--|--|--|--|
| | | <p><u>Detachable Part:</u></p> <ul style="list-style-type: none"> • Hoist system, principal functionality • Technical functionality of the subassemblies • Possible failure modes and malfunction • Hoist cable, assessment of different cable-failure modes • Fitting and use of the hoist | | |
| Theory 1.7 | <ul style="list-style-type: none"> • Preparing the helicopter and hoist equipment for HHO | <ul style="list-style-type: none"> • Prerequisites for hoist operation (e.g., cable deflectors) • Compatibility of the hoist system with other installed optional equipment • Requirements of the MEL fulfilled? • Rescue equipment adequate stowed? • Emergency rescue equipment installed? | | <p>AMC 1 SPA.HHO.130(f)(1) Crew requirements for HHO (Point (a))</p> |
| Theory 1.8 | <ul style="list-style-type: none"> • Duties and responsibilities of Flight- and Technical Crew Members as well as the rescuers / HHO-passengers (If not already done under 1.5) | <ul style="list-style-type: none"> • Pilot’s responsibilities: • Appropriate Approach pattern • Final approach with consideration of the intended hoist procedure • Smooth transition to and from the hover position • Hover height and position with sufficient accuracy • Observing power limitations • Adapting emergency procedures in accordance to the position of the hoist load | | |
| Theory 1.9 | <ul style="list-style-type: none"> • Knowledge about standard flight procedures (If not already done under 1.5 or 1.3) | <ul style="list-style-type: none"> • Different approach patterns • Final approach • Standard pickup procedure • Special pickup procedures (“rapid rope-cutting rescue”, Pickups with limited access). • Departures | | |

| | | | | |
|----------------|---|---|--|--|
| Theory 1.10 | <ul style="list-style-type: none"> • Knowledge about standard hoist procedures (If not already done under 1.5) | <ul style="list-style-type: none"> • Single person hoist-operation • Double person hoist-operation • Hoist operation with horizontal rescue devices • Water rescue procedures (lakes and drifting water, rivers etc.) | | |
| Theory 1.11 | <ul style="list-style-type: none"> • Knowledge about radio commands and standardized phraseology | <ul style="list-style-type: none"> • Signs of professional communication • Standardized radio commands between TCM-HHO and pilot flying • Standardized hand signals (also in case of communication failure between TCM-HHO and pilot) | | |
| Theory 1.12 | <ul style="list-style-type: none"> • General description of PPE, PCDS and rescue equipment | <ul style="list-style-type: none"> • PPE of Flight Crew and Technical Crew • PCDS of Rescuer • Rescue Harness • Rescue triangle (seat) • Forest penetrator rescue seat • Rescue sling • Rescue basket • Rescue bag • Hoist emergency equipment | | |
| Theory 1.13 | <ul style="list-style-type: none"> • Knowledge about usage of the operational checklists | <ul style="list-style-type: none"> • Before take-off checklist • Before operation checklist (<i>i.e. Hoist Pre-Hoisting Checks</i>) • After operation checklist | | |

| | | | | |
|-----------------------|--|---|---------|--|
| Theory 1.14 | <ul style="list-style-type: none"> • Crew Resource Management | <ul style="list-style-type: none"> • CRM training elements, Command course | | Operation ORO.FC.115 Crew resource management (CRM) training |
| Theory 1.15 | <ul style="list-style-type: none"> • Prevention of hazards | <ul style="list-style-type: none"> • Danger of additional g-loads • Danger of shock loads • Danger of cable entanglement • Danger of cable rebound • Danger of cable chafing • Danger of swinging loads • Danger of incorrect adjusted homing load • Danger of static electricity • Danger of downdraft effects • Danger when flying with open doors • specific dangers relating to the operating environment (<i>collision avoidance, impact of local meteorological conditions</i>) <p><u>Discussing some related accident reports</u></p> | | |
| Theoretical Checks | | Theoretical written test, including an adequate number of questions covering the different topics .75% of correct answers to pass the exam. | 01 hour | Regulation (EU) 965/2012 on air operations AMC1 SPA.HHO.130 (f)(1) + AMC1 ORO.TC.110 (4) + ESPN-R PROPOSAL |

Note: Initial theoretical training for HHO pilot (Module 1) is considered valid following the completion of a theoretical written test, including an adequate number of questions covering the different topics. (*75% of correct answers to pass the exam*). Duration: approx. 1 hour

Crew Coordination in Helicopter Hoist Operation ORO.FC.115 Crew resource management (CRM) training, CRM training elements, Command course.

The team of any Hoist Operation is composed of several actors who performs a task that goes far beyond the "normal case" in the piloting of a helicopter.

Crew coordination has to be established by the operator and is the key to a successful Hoist Operation, each member must clearly know their own duties and the tasks of all the others involved.

The principles below apply to all HHO crew members, the Pilot in Command during HHO must *demonstrate* the following **non-technical skills**:

- CRM-principles
- Crew Coordination Concept-principles

GM6 ORO.FC.115 Crew resource management (CRM) training NON-TECHNICAL SKILLS ASSESSMENT (a) NOTECHS (non-technical skills) is a validated method for assessing flight crew CRM skills.

| Table 4— Categories, | Element | Behavioral marker (examples) |
|--|------------------------------------|--|
| Cooperation | Team building and maintaining | Establishes atmosphere for open communication and participation |
| | Considering others | Takes condition of other crew members into account |
| | Supporting others | Helps other crew members in demanding situations |
| | Conflict solving | Concentrates on what is right rather than who is right |
| Leadership and managerial skills | Use of authority and assertiveness | Takes initiative to ensure crew involvement and task completion |
| | | effective communication & coordination other operational personnel and ground services |
| | Maintaining standards | Intervenes if task completion deviates from standards |
| | Planning and coordination | Clearly states intentions and goals |
| | Workload management | Allocates adequate time to complete tasks |
| Situational Awareness, Decision making | Awareness of aircraft systems | Monitors and reports changes in systems' states |
| | Awareness of external environment | Collects information about environment (position, weather and traffic) |
| | Anticipation | Identifies possible future problems |
| | Problem definition and diagnosis | Reviews causal factors with other crew members |

| | | |
|--|--------------------------------------|--|
| | Option generation | States alternative courses of action |
| | | Asks other crew members for options |
| | Risk assessment and option selection | Considers and shares estimated risk of alternative courses of action |
| | Outcome review | Checks outcome against plan |
| | resilience development | |
| | surprise and startle effect | |

See also reference document: Flight Standards Directorate, Appendix 3 of Concept Paper Making the Case for Helicopters in Evidence Based Training RMT.0599 – Update of ORO.FC - link [here](#)

4.3 Module 02 -Basic practical / flying Training HHO Pilot – SPA.HHO.130(f)(1)

Training objectives:

The trainee pilot will be provided with the information and instructions necessary to safely perform basic hoist operations in accordance with the requirements of the appropriate flight manual and hoist manufacturer's operator manual.

The trainee pilot will be familiar with the hoist operation procedures and be able to use it practically under normal, abnormal and emergency conditions.

The trainee pilot will be able to perform, NHEC, single and double HEC lifts, in clear and confined areas.

Module 02 - Basic Pilot Training HHO:

Technical skills Note: Non-exhaustive list

| Module 2 | Topics to be covered (Not limited to) | Contents (not limited to) | Recommended duration of training | references |
|---|---|--|--|------------|
| Flight preparation, Briefing, Activities | Crew preparation | <ul style="list-style-type: none"> • Personal equipment (PCDS) | As applicable for the planned mission/sorties. | |
| | Pre-flight planning and briefing | <ul style="list-style-type: none"> • Hoist area (ESPN-R recommends familiar hoist area) • Weather minima • Fuel management • Mass & Balance • Performances | | |
| | Aircraft & Hoist preparation | <ul style="list-style-type: none"> • Cabin setup • Safety equipment for hoist operations | | |
| | Standard pattern (clear area / different hover height): Remark: The pattern should be conducted according the environment. During the training the cable length should vary (short and long cable) | <ul style="list-style-type: none"> • Performed pre-hoisting check-lists • Fly away • Pattern • Voice procedure • Final approach • Transition from and to a stable hover • Pick-up/lifting procedure (lifting load off the ground, by helicopter or hoist) | | |
| Abnormal Situations and Emergency procedures NOTE: Depending on the hoist system, some procedures may differ. Emergency situations to be trained are system related and their training scope has to be defined by the organization. ESPN-R recommends emergencies to be trained only with NHEC | <ul style="list-style-type: none"> • Loss of communications • Swinging load (longitudinal, lateral, cone, etc.) • Hoist failure, <ul style="list-style-type: none"> ○ Hoist motor runaway ○ Hoist motor failure ○ Servo motor failure • OEI during approach / hover / fly away • Single & Double generator failure • Insufficient power • Load rotation / spinning | | | |

| | | | | |
|--------|---|---|---|---|
| | | <ul style="list-style-type: none"> • Entanglement scenarios • Decision making for cable cutting scenarios | | |
| Flight | <p>-Day operations only for on-shore-</p> <ul style="list-style-type: none"> • Crew preparation; • Pre-flight planning & briefing • Aircraft and equipment preparation; • Standard pattern (clear area / different hover height); • Emergency procedures; • HHO operations in large confined areas and specific dropping point (shelter....) | <ul style="list-style-type: none"> • Operation of inter-communication and radio equipment; • Performed hoist checks and pre-hoisting checks; • Guidance over HHO sites; • Standard hoisting circuit; • Aircraft positioning using standard phraseology between Hoist Operator and Pilot; • Horizontal and vertical rotor and tail clearance; • Operation of hoist equipment; • Non HEC single lift (use of load) on clear area; with different cable lengths • Hoist malfunctions and emergency procedures (i.e.: mechanical, electrical, loss of communication, etc.); • Aircraft malfunctions and emergency procedures, including simulation of an engine failure; • Standard hand signals; • Control of the swing and spinning avoidance/mitigation; • Area reconnaissance, detection of specific dangers relating to the operating environments (<i>Risk assessment method</i>); • Elements of CRM like decision making, situation awareness (not limited to); • De-briefing. | <p>An estimated minimum of 4 training flights is recommended, 45' to 1 hr. each.</p> <p>The training concept is competence based and the recommended number of hoist cycles may vary on the trainee performance and skills.</p> | <p>Regulation (EU) 965/2012 on air operations + ESPN-R PROPOSAL</p> |

After completing, the “Basic Training HHO Pilot” the trainee will be released with a basic HHO Pilot qualification and will be cleared to proceed through the Operator Specific Training (on helicopter type and mission/procedure/equipment specifics).

NOTE: for off-shore operations, the first part of the initial training (module 2) should be conducted on-shore (e.g., on an airfield) but are not credited for the 50 off-shore cycles required.

4.4 Module 3 – Operator on Type Training for HHO Pilot

Training and checking must be defined by the operator in the Operations Manual (OM) and approved by the competent authority. It might include an “on type”, onshore, offshore, NVG, etc. -training according to the need / type of operation.

| Note: basic HHO training (module 1 & 2) have to completed before conducting module 3 Module 3 on-shore | Topics to be covered | Contents (not limited to) | Guideline for recommended scope of training | References |
|--|---|---|---|------------|
| Onshore Day Ops | Standard procedures according to the Operators Manual | HEC Single (one person) hoist Double (two persons) hoist Special hoisting according to the mission (Rescue bag / stretcher with dummy load accompanied by rescuer (HEC), rescue seat...) | For number of cycles, refer to regulation | |
| High Altitude, mountainous area | | Basic mountain training/ rating required mountainous area means an area of changing terrain profile where the changes of terrain elevation exceed 3000ft in a distance of 10 nautical miles | 15 cycles | |
| Special Ops | | Targets with diff. references for example: Towers, Cranes, Chimneys Special Targets for example: Cable Car, Wind turbine Non exhaustive list... | TBD by the operator | |
| Water Rescue | | Inland water operations Lakes, Rivers | TBD by the operator | |

| Module 3 off-shore | Topics to be covered | Contents (not limited to) | <i>Guideline for recommended scope of training</i> | <i>References</i> |
|--------------------|---|---|--|-------------------|
| Offshore Ops | Standard procedures according to the Operators Manual | <p style="text-align: center;">NHEC</p> <ul style="list-style-type: none"> • Material hoisting according to the mission | 5 Cyc - TBC by the operator | |
| | | <p style="text-align: center;">HEC</p> <ul style="list-style-type: none"> • Single person lift • Dual person lift • Special hoist according to the mission (stretcher, highline, basket...) | | |
| | | <p>Static Target</p> <ul style="list-style-type: none"> • Wind Turbine • Water rescue (Wet hoisting) • Static structures (e.g., light house) <p>Moving Target</p> <ul style="list-style-type: none"> • Water rescue (Wet hoisting) • Ship hoisting | <i>Additional 50 Cyc</i> | |

Note: before assignment to duties, a minimum of 50 cycles (or 50 off-shore cycles) is required per SPA.HHO.130

4.5 Module 4 – NVIS

| Module 4 | Topics to be covered | Contents (not limited to) | <i>Guideline for recommended scope of training</i> | <i>References</i> |
|--------------------|--|--|---|-------------------|
| | <ul style="list-style-type: none"> - Light systems management - Standard Hoist Procedures using NVG - A review of the voice marshalling (NVG flight specific) - Crew coordination appropriate to NVG operations - Wire and obstacle detection - Clear and confined area landing - Emergency Malfunctions and procedures for various NVIS failures and inadvertent IMC | <ul style="list-style-type: none"> • NVIS: Advanced NVIS Training required and sufficient NVIS experience (50 hrs., before assignment to duties) in the foreseen operational environment recommended. Scope TBD by the operator, with associated risk assessment and approval of the competent authority <p>Procedure training (NHEC/ HEC) according the mission specific night</p> | | |
| Offshore Night Ops | Standard procedures according to the Operators Manual, specific night | <p>Conventional:</p> <ul style="list-style-type: none"> ✓ VFR Night experience (50 hrs. recommended) ✓ Scope TBD by the operator, with associated risk assessment and approval of the competent authority <p>Procedure training (NHEC/ HEC) according the mission specific night</p> | <p><i>SPA.HHO. 130 20 out of 50 Cyc have to be conducted at night</i></p> | |



Note: SPA.NVIS.130 Crew Requirement for NVIS operations (b.) Experience: Entry level requirement, (c) Operational training i.a.w. NVIS procedures in the operations manual

Note: ESPN-R recommends NVIS operation at night on-shore and off-shore, depending the operational environment.

Note: A NVIS syllabus have to be established by the operator to cope with the actual requirements, also depending on national regulations.

Instructor:

The basic pilot HHO training fundamentals should be provided by an instructor (minimum level, TRI privilege on type used) with HHO experience relevant to the operation in the operator's environment, nominated by the operator.

5 CONDITIONS FOR ASSIGNMENT TO DUTIES

| | | | | |
|----------------------|---|--|--|--|
| <p>Check Flights</p> | <p>In-flight checking should cover all aspects of the flight training phase including Hoist malfunctions and emergency procedures;</p> <p>The assessments may be performed with HEC, except emergency procedures.</p> | <ul style="list-style-type: none"> • Pre-flight briefing; • Preparing the helicopter and specialist equipment for HHO; • Communication; crew coordination concept, CRM elements • Area reconnaissance, detection of specific dangers relating to the operating environments; • Guidance over HHO sites; • Single and/or double HEC lifts • Hoist malfunctions and emergency procedures; • Situation awareness • De-briefing | <p>The flight time should give the trainer the possibility to evaluate the skills of the trainee, 3 normal hoist procedures/Cyc in the intended operational environment, at least one hoist emergency procedure should be included</p> | <p>Regulation (EU) 965/2012 on air operations AMC1 SPA.HHO.130 (f)(1)(b) + ESPN-R PROPOSAL</p> |
|----------------------|---|--|--|--|

HHO pilot training – Checks

A proficiency check should be performed covering all aspect of the flight-training phase including hoist malfunctions and emergency procedures.

Note: a proficiency check has to be performed before assignment to duties or to new duties.

5.1 HHO Pilot

SPA-HHO.130 Crew Requirements for HHO

6 RECENCY – SPA-HHO.130 (d)

7 RECURRENT TRAINING AND CHECKING

Recurrent training, the flight crew should complete annual recurrent flight and ground training relevant to the type of aircraft operated, including training on the location and use of all emergency and safety equipment carried.

The recurrent training should also include HHO training. It is recommended that this annual training includes at least 3 cycles in normal operations, and 2 cycles with emergency procedures in the operator's environment.

Two cycles with emergency procedures are sufficient if the different emergency procedures are reviewed / retrained over a three-year period.

Recurrent checking, The ESPN-R Hoist Working group recommends annual recurrent HHO checking, including at least 3 cycles.

This number is sufficient if the different normal and emergency procedures are checked over a three-year period.

8 MISCELLENEOUS

ESPN-R hoist safety promotion working group proposes that the hoist technical crew are trained in accordance with another acceptable standards, such as ESPN-R hoist operator training guide.

ANNEX 01

Example for syllabus/ grade slip proposal for flight activities

1. Module 02- basic Pilot HHO

| | | FLIGHTS | | | | | | | | | | Final Result |
|--|---|---------|---|---|---|---|---|---|---|---|----|--------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Module 2 - AB-INITIO HOIST PILOT FLIGHT TRAINING SYLLABUS | MANOUVERS/TASKS/PROCEDURES | | | | | | | | | | | |
| | Pre-flight briefing | | | | | | | | | | | |
| | Risk assessment for HHO | | | | | | | | | | | |
| | Mass and balance management | | | | | | | | | | | |
| | Communication | | | | | | | | | | | |
| | Performed hoist checks and pre-hoisting checks | | | | | | | | | | | |
| | Area reconnaissance, detection of specific dangers relating to the operating environments | | | | | | | | | | | |
| | Standard hoisting circuit | | | | | | | | | | | |
| | Approach to HHO site | | | | | | | | | | | |
| | Guidance over HHO sites, Horizontal and vertical rotor and tail clearance | | | | | | | | | | | |
| | Aircraft positioning using standard phraseology between Hoist Operator and Pilot | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Departure from HHO site | | | | | | | | | | | | | |
| Hoist cycle (non HEC) | | | | | | | | | | | | | |
| Generator Failure, Single / double | | | | | | | | | | | | | |
| Single Engine Failure (Multi Engine Helicopter) | | | | | | | | | | | | | |
| Hoist System Failure (motor runaway, motor failure, overheat, etc. | | | | | | | | | | | | | |
| Intercom failure | | | | | | | | | | | | | |
| Cable entanglement | | | | | | | | | | | | | |
| Simulated cable cut | | | | | | | | | | | | | |
| Cable damage, miss wrap, shock load, (...) | | | | | | | | | | | | | |
| Insufficient power / performance | | | | | | | | | | | | | |
| Hoist cycle (non HEC and HEC) | | | | | | | | | | | | | |
| Elements of CRM like decision making, situation awareness (but not limited to) | | | | | | | | | | | | | |
| De-briefing | | | | | | | | | | | | | |
| Cable Conditioning | | | | | | | | | | | | | |
| Loss of stabilization system (Autopilot) | | | | | | | | | | | | | |

NOTE: non exhaustive list

NOTE: the assessment of CRM skills is made using the methodology of “Table 4 - Categories, elements and behavioral markers of NOTECHS (non-technical skills), or equivalent”.

NOTE: the use of the scoring table, is that the trainee has demonstrated sufficient performance of each skill to be ready for a check flight.

| | | FLIGHTS | | | | | | | | | | Final Result |
|---|--|---------|---|---|---|---|---|---|---|---|----|-----------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Module 3 ON-SHORE HOIST PILOT FLIGHT TRAINING SYLLABUS | MANOUVERS/TASKS/PROCEDURES | | | | | | | | | | | |
| | Preflight operation briefing (obligatory for each operation to be performed) | | | | | | | | | | | |
| | Mountain | | | | | | | | | | | |
| | Cable Car (Cabin, open seat) | | | | | | | | | | | |
| | Water Rescue (river, canyon, lake, etc.) | | | | | | | | | | | |
| | Wind Turbine | | | | | | | | | | | |
| | Crane, chimney, buildings, | | | | | | | | | | | |
| | Vessels, ship | | | | | | | | | | | |
| | Urban cities | | | | | | | | | | | |
| | Rigid structures | | | | | | | | | | | |
| | Moving targets | | | | | | | | | | | |

| | | FLIGHTS | | | | | | | | | | | |
|--|--|---------|---|---|---|---|---|---|---|---|----|-----------------|--|
| Module 3 OFF-SHORE HOIST PILOT FLIGHT TRAINING SYLLABUS | MANOUVERS/TASKS/PROCEDURES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Final Result | |
| | Preflight operation briefing (obligatory for each operation to be performed) | | | | | | | | | | | | |
| | Difficult vessels, sail boats, etc., moving targets, etc. | | | | | | | | | | | | |
| | Wind Turbine (top basket) | | | | | | | | | | | | |
| | Wind Turbine (transition piece) | | | | | | | | | | | | |
| | Water Rescue | | | | | | | | | | | | |
| | High sea state environment | | | | | | | | | | | | |
| | Low reference scenarios | | | | | | | | | | | | |
| | Stretcher | | | | | | | | | | | | |
| | Rigid structures (e.g., light houses, transformer stations, etc.) | | | | | | | | | | | | |
| | hi-line procedures | | | | | | | | | | | | |
| | Special equipment, rescue strop, basket, etc. | | | | | | | | | | | | |

NOTE: the above-mentioned topics are non-exhaustive and have to be tailored to the operation foreseen.

Scoring method: After each flight the Pilot Instructor will evaluate and give a score to the student, by the use of the scoring table. The aim is, that the trainee has demonstrated sufficient performance of each selected skill to be ready for a check flight. A check flight may be limited to the operation, on which the pilot will be assigned to duties.

The scoring method might be defined by the operator and can use numbers (find example table below), the final score must be above the limit defined by the Operator. In addition, the Operator might define a minimum level to obtain for each flight sortie, If the level is not reached the student shall perform the same sortie again.

The training concept is training to proficiency. Hoist cycles may be adapted, based on the demonstrated performance skill of the student, but not below the minimum number of hoist cycles required by the rules.

In this context a hoist cycle shall include a transition from and to the hover, one down and up cycle of the hoist hook, delivering or picking up a person or an object to or from a surface (land, sea, deck, raft, etc....).

Example scoring method:

| SCORING METHOD | |
|----------------|---|
| D | Demonstration |
| 1 | Performance above average; |
| 2 | Detects errors independently and eliminates them. Training goal achieved; |
| 3 | Makes occasional mistakes, exercise must be repeated; |
| 4 | Frequently makes mistakes, must be corrected, repeat exercise. |

ESPN-R Hoist Safety Promotion working group

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