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Technical Domain / Task Number 2 …………………………………

Author(s) / Submitter(s) Korea Institute of Aids to Navigation

**Proposal on Registration of Drone in IALA Dictionary**

**and Establishing WWA Model Course**

**1 SUMMARY**

**1.1 Purpose of the document**

This input paper introduces the current status of drone use and related regulations for the operation and management of Aids to Navigation. Accordingly, it is proposing the registration of the term 'Drone' in the IALA Dictionary and establishing a WWA model course.

**1.2 Related documents**

None

**2 BACKGROUND**

The Republic of Korea prepared a basis\* that can be used for related tasks such as installation and improvement, inspection and maintenance of Aids to Navigation through the establishment of regulations following the introduction of drones.

\*Guideline for Aids to Navigation facilities maintenance, Article 6 Operation of drone

Based on the above rule, a drone can be used for Aids to Navigation related tasks. And when the drone is used to inspect AtoN (Leading light, Sector light, Tidal current signal system, etc.) at a height of 20 m or more, it is considered that AtoN inspection work has been performed.

In this regard, the Republic of Korea enacted the Drone Operation Guideline\* to stipulate necessary matters for the safe and efficient management and operation of drones introduced to the MOF (Ministry of Oceans and Fisheries) and its affiliated organizations. The guideline requires certification issued for the operation of drone in accordance with qualification standards and test procedures⋅methods. In accordance with the guidelines, training is provided so that operators can acquire pilot certification for the smooth operation of drones.

Currently, the Republic of Korea is promoting the training of drone operators by providing training courses to acquire drone operator licenses for AtoN workers through KATON (Korea Institute of Aids to Navigation).

\*MOF Instruction No.559 MOF Drone Operation Guideline

Since drones are not limited by geographical characteristics, disaster sites, or obstacles, it is possible to quickly inspect and manage AtoN in all weather conditions. Accordingly, when inspecting AtoN and lighthouses installed on offshore reefs or underwater breakwaters that are difficult to access due to bad weather, it is possible to replace the inspectors, thereby ensuring the inspectors' safety. In addition, when inspecting the underwater AtoN foundation or the top of a lighthouse, which has poor accessibility, drones can easily identify whether the foundation has been scoured or if there are cracks and damage to tall facilities.

In addition, it implements a function that analyzes the transmitted images in real time through the drone to determine whether the AtoN installed are operating in good condition.

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| (Scope) Drone for AtoN can be used for related tasks such as installation and improvement of AtoN, inspection and maintenance.  (Inspection and Maintenance) If Drone for AtoN is used to inspect AtoN(Leading light, Sector light, Tidal current signal system, etc.) at a height of 20 m or more, it is deemed that the AtoN inspection and maintenance work has been performed.  (Operation Plan) The heads of departments and organizations that own and operate drones for AtoN must establish a year-round operation plan, including the following:  1.Matters concerning the designation of the head of the drone management⋅operation department  2. Matters concerning the status of drone use and maintenance⋅repair  3. Matters concerning safety and education related to drone  4. Matters concerning activation of drone operation  5. Matters concerning the management and security of information obtained by drone  6. Other matters necessary for the operation of the drone system  (Education and Training) Departments and institutions that possess and operate drones for AtoN must have device declaration (registration) and pilot certification qualifications according to the weight and type of drone according to internal guidelines. |

Guideline for Aids to Navigation facilities maintenance, Article 6 Operation of drone

**3 DISCUSSION**

**3.1 Register the term "Drone" in the IALA Dictionary**

In order to reflect the digitalized AtoN work environment, it is proposed to register “Drone” in the IALA Dictionary as follows.

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| **Drone / SUA; Small Unmanned Aircraft**  “Drone” is unmanned aerial vehicles,  1. Unmanned Aerial Vehicle: Unmanned aerial vehicle, unmanned helicopter or unmanned multicopter whose own weight, excluding fuel, is 150 kg or less  2. Unmanned Plane: An unmanned aerial vehicle having a weight of not more than 180 kilograms, excluding the weight of fuel, and a length of not more than 20 meters. |

**3.2 Establishment of WWA Model Course**

Currently, AtoN service crafts and buoy tenders are being used to inspect AtoN, and the training\* is provided in the WWA Level2 AtoN Technician Course to improve the safety and inspection ability of inspectors.

\*C2006-1 ATON SERVICE CRAFT AND BUOY TENDERS(2016.6.)

Just as AtoN Service Craft is used as an essential tool for checking AtoN, as aircrafts are introduced and activated, it is necessary to establish a WWA model course for drones in order for AtoN to strengthen the capabilities of the AtoN inspectors. Through this, drones can be used for related tasks such as installation⋅improvement, inspection⋅maintenance, and the safety of inspectors can be secured.

For the purpose of understanding AtoN operation, AtoN inspection and maintenance methods and equipment through the use of drones for AtoN, this paper introduces the proposed WWA Model Course as follows:

Module 1: Drone for AtoN Theoretical Knowledge

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| **Course** | **Details** |
| Aviation laws | Aviation laws necessary for the relevant business |
| Aeronautical Meteorology | Basic knowledge of aviation  Understanding of general weather activities in aviation, etc. |
| Flight theory and operation | The basic principle of flight of drone  Knowledge of the structure and function of drone, etc.  Ground run (ground activity) of drone, etc.  Take-off and landing of drone  Emergency procedures for drone  Knowledge of the safety management of drone, etc. |

Module 2: Operation of drones for Aids to Navigation

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| **Course** | **Details** |
| Basic Operation | Aircraft and pilot matters  Matters related to weather, airspace and airfield  General knowledge and emergency procedures, etc.  Pre-flight check  Ground run (or take-off and climb or take-off motion)  Air Manipulation (or Flight Movement)  Landing Manipulation  Post-flight inspection, etc.  Abnormal procedures and emergency procedures, etc. |

Module 3: AtoN Inspection Practice

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| **Course** | **Details** |
| Inspection of AtoN  Using Drones | Drone operator  Purchase and registration of drone  Operation of drone  Management of drone acquisition information  Drone equipment management  Safety accident management |

**4 REFERENCES**

* G1092 Safety management for AtoN activities(2017. 12.)
* G1151 Maintenance of AtoN structure(2019. 12.)
* C2006-1 AtoN Service craft and buoy tenders

**5 ACTION REQUESTED OF THE COMMITTEE**

The Committee is requested to:

* Discuss the feasibility of enlisting in the IALA Dictionary regarding drone for AtoN and establishing the WWA model course
* Consider to register as a new work program in the next session(Work Plan 2023-2027)
* Consider to enact related guidelines

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)