Forest Aviation Headquarters

Aviation Safety
Briefing

Safety First ! 산림항공본부
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안전한
산림항공!

Status of the Agency

Achieved Accident-Free Aerial Application of Chestnut Pesticides for 14 Consecutive Years

▶ **Aerial application of the chestnut pesticides was performed on 24 Si·Gun nationwide during July 13th ~ 31st successfully without any safety accidents.**

< Image on the Encouragement for Accident-Free Flight >

- Even though the fatigue of the team members performing the mission was very high under the intense heat exceeding the highest level every day, aerial application of the chestnut pesticides was completed safely through preliminary safety inspection and systematic flight control.
- In this aerial application, 14 helicopters of Forest Aviation Headquarters (FAH) (6 large-scale & 8 small-scale) were dispatched to a total of 17,539.8ha of chestnut plantation areas.
- Aerial application area for each region is in the order of ▲Gyeongnam - 8,038.8ha ▲Chungnam - 6,108.2ha ▲Jeonnam - 2,561.2ha ▲Chungbuk - 634.9ha and ▲Sejong – 196.7ha.

Forest Aviation Headquarters (FAH) Staff Selected for Compliment on Safety Culture

▶ **'FAH Staff for Compliment on Safety Culture' selected from July, 2021 to enhance the interest on aviation safety and to boost the atmosphere for safety culture**

- (July) Forest Aviation Division, Lee Eun-hak / Performed mountain life-saving missions actively to rescue the injured safely
- (August) Yangsan Forest Aviation Office, Choi Won-sang / Contributed to establishing the safety culture by producing the video on accident cases related to aviation safety
- (September) Hamyang Forest Aviation Office, Jeon Hyung-kyu / Prevented safety accidents in villages near the aerial application sites through announcements by utilizing drones

< Staff for Compliment in July >   < Staff for Compliment in August >   < Staff for Compliment in September >

Presentation of Awards on the Staff Contributing to Accident-Free Forest Aviation in 2021

▶ **Forest Aviation Headquarters (FAH) held the ceremony on '2021 Accident-Free Forest Aviation Awards' for the pilots and maintenance technicians that contributed to achieving the goal of accident-free forest aviation.**

- A total of 49 staff (11 staff in the headquarters & 38 staff in the offices) received the awards, and they served for 10 ~ 20 years without accidents or incidents in the flight and aviation maintenance field.

< Ceremony on 2021 Accident-Free Forest Aviation Awards held in the Headquarters >

< Award Winners >

김명중	주경훈	조효상	김현철	최연성
박병석	박만희	정귀천	최근홍	김용호
이경수	노재용	최진훈	이춘환	홍영희
박동기	박정욱	김종칠	조경일	박인성
김창호	조병우	장재영	김창섭	장성규
김주훈	이병춘	김영구	이래권	전헌수
유재봉	하용욱	임현택	최혁선	황영용
홍현기	김창우	송근식	송득용	최 철
이현식	이창진	이범환	이용훈	장종오
박동성	권혁진	이상우	신재우	

Distribution of PR Materials on the Cases of Risk Factors in Forest Aviation Maintenance

▶ **From 2021, Forest Aviation Headquarters (FAH) produced and distributed the 'PR Materials on Cases of Risk Factors in Forest Aviation Maintenance' to improve the aviation maintenance quality.**

- (No. 4) A case on damage of the electrical system on the hydraulic supply system of the large-scale helicopter (KA-32)
- (No. 5) Propagation on the cases of accidents of the private helicopters (Crash landing due to fire during the flight)
- (No. 6) A case of corrosion on the main tire wheel of the large-scale helicopter (KA-32)

< No. 4 (2021.6.9.) >   < No. 5 (2021.7.14.) >   < No. 6 (2021.8.17.) >

Korea Forest Service Is Promoting International Cooperation with International Organizations Related to Forest Fire.

▶ **Is promoting international cooperation on forest fire with international organizations such as Asian Forest Cooperation Organization (AFOCO) and Food & Agriculture Organization (FAO)**

- Global forest fire management mechanism is being established with **Food & Agriculture Organization (FAO)**, and '**Forest Fire Forum**' will be convened as a special session in the '**World Forestry Congress (WFC)**' that will be held in Seoul on May, 2022 (prospected to exchange various policies and technologies on preventing and extinguishing forest fire, and also derive the joint response method on forest fire).

  * **Forest Aviation Headquarters (FAH)** will have an independent booth during the WFC period to discuss with the countries and agencies participating in the congress on the safe management method of the helicopters in response to forest fire.

- The equipment for extinguishing forest fire is being supplied to the member countries through **Asian Forest Cooperation Organization (AFOCO)** (10 vehicles for extinguishing forest fire were delivered to ASEAN member countries from 2019, and equipment operation know-how was informed to support the capability of responding to forest fire).

Korea Forest Service (KFS) Minister Choi Byeong-am Visited Forest Aviation Headquarters (FAH) for the First Time.

▶ **KFS Minister Choi Byeong-am visited FAH on August 4th to encourage the staff working in the site.**

- KFS Minister Choi Byeong-am emphasized that "in honor of this 50th year of establishing the Forest Aviation Headquarters, we shall continue the efforts on R&D of aviation maintenance, flight and safety engineering for the future vision of next 50 years, and prepare for securing the world-class technology."

Forest Aviation Headquarters held the Forest Drone Competition in the 50th Anniversary of Establishment.

▶ '1st FAH Forest Drone Competition' held on September 3rd in the 50th anniversary of establishment

- In this event held on competing the drone piloting abilities such as pilotage and dropping the fire extinguishing agent, 20 forest drone pilots participated in the competition from the headquarters and 11 offices.

- Along with the competition on pilotage, the event was organized with various entertainments such as drone racing and swarming by PABLO Air, and the winners of the competitors will be representing the Forest Aviation Headquarters for the 'KFS Forest Drone Competition' that will be held in October.

 * Competition Results : (Grand Prize) Cheongyang Forest Aviation Office, (Excellence Award) Gangneung Forest Aviation Office, (Participation Award) Yangsan Forest Aviation Office

Business Agreement Between Forest Aviation Headquarters (FAH) and Korea Institute of Aviation Safety Technology (KIAST) for Development of Unmanned Aerial Vehicle

▶ Business agreement signed with KIAST (President Kim Yeon-myung) on August 25th for seeking various development methods for the unmanned aerial vehicles and aviation safety field

- The goal of the mutual partnership is to expand and develop the utilization of unmanned aerial vehicles in the forest sector through mutual support and cooperation such as introduction and operation of drones specialized for the mission, technical support and information exchange.

Forest Aviation Headquarters (FAH) Visited the Transmission Line Site for Safety Management.

▶ FAH visited the transmission line sites in Samcheok-si, Gangwon-do with KEPCO to check the safety management status, and discussed on the cooperation required for the management of the transmission lines such as improving the aviation obstacle marking for the safe flight of forest helicopters.

※ Among a total of 37 accidents occurred in Forest Aviation Headquarters, 4 accidents were from the crash with the high-tension power lines, and especially in the accident that occurred in 2017, Aviation & Railway Accident Investigation Board (ARAIB) suggested the safety recommendation, "systematizing the transmission line information for providing the training periodically."

Seoul Forest Aviation Office performed an investigation on salinity of the sea water inflow area to secure the safety of the helicopters.

▶ An investigation was performed on the salinity focused on the catchment in the sea water inflow area on the West Coast of the Metropolitan Area during June ~ August to secure the safety of the forest firefighting helicopters

- Even when there was a catchment near the site of the forest fire, it was difficult to identify the salinity and thus used to use the safe catchment that is far away to delay the quick response to forest fire, but through this investigation on salinity, we expect to perform efficient response to forest fire more quickly.

  * When a helicopter collects water from the catchment with high salinity, the salt could corrode the body and engine of the helicopter to result in defect or failure.

Large-scale Helicopters Are Used to Rescue the Mountain Climbers on Emergencies.

▶ **Forest Aviation Headquarters and Jincheon Forest Aviation Office safely rescued the mountain climbers in emergency situation on June 9th (Dowon0ri, Mureungdowon-myeon, Yeongwol) and June 12th (Jakseongsan Mountain, Jejcheon).**

※ In December, 2006, Forest Aviation Headquarters established the Forest Aviation Rescue Team (equipped with large-scale helicopters with emergency rescue equipment and have emergency medical technician) to rescue the mountain climbers on emergencies.

Domestic Status

'NARAE (National ATM Reformation & Enhancement) (Draft)' Confirmed for Improving the National Safety·Convenience

Source : MOLIT Website

▶ **The Ministry of Land, Infrastructure & Transport (MOLIT) announced the confirmation of the 'NARAE (National ATM Reformation & Enhancement) (Draft)' for responding to the changing aviation environment such as AI·Big Data·Urban Air Mobility (UAM), etc., and to guarantee the optimum flight path through scientific traffic control.**

- **(Main Contents)** ① Support optimum and seamless flight of airlines by constructing diversified support system such as flexible civil·military airspace operation and air control·airport·air space ② Provide traffic control method on new flight vehicles to support the goal of activating UAM ③ Promote the reinforcement of controller training and the improvement of working environment for continuous control operation during COVID-19 and in preparation for sudden increase in air traffic after COVID-19

- **(Expected Effects)** Improvement of flight safety, decrease in flight delay, reduction of fuel cost·carbon emission, etc., and development of new industries such as Drone·UAM

< Vision & Goal of NARAE >

< Vision >
Guarantee Seamless, Safe & Optimum Flight through Data·System Support

Goal		Previous (2019)	~ 2024 (Short-term)	~ 2042 (Mid-Long Term)
	◆ Increase in Flight Efficiency	Domestic – 63 min., International – 97 min.	(Domestic)62.7 min., (International)96.7 min. (Flight Time 0.5%↓)	(Domestic)56.7 min., (International)87.3 min. (Flight Time 10%↓)
	◆ Increase in Traffic Volume Processing	Total Traffic of 840,000 Flights	840,000 Flights (Recovery of ATM Traffic Volume)	1.69 million Flights (ATM Traffic Volume ↑ by 2 times)
	◆ Improvement of User Convenience	Departure·Arrival 76%	Departure·Arrival 77% (On-time Performance 1%↑)	Departure·Arrival 92% (On-time Performance 20%↑)

▶ **MOLIT announced that the 'Aviation Safety Data Analysis Center' will be operated from May 27th to prevent aviation accidents through data-based scientific decision-making.**

- **(Main Contents)** The data that was previous managed separately by the government agencies and airlines, etc. will be integrated and analyzed to produce various safety information such as the Tendency of Aviation Safety* to support the concerned parties in the industry to taken safety measures preemptively

  * The tendency of failures according to each aircraft type/age and faults due to flight characteristics such as cargo transport/aircraft use business, etc., and the trend of occurrence in safety accidents according to the operating condition and environment including the airport, air space/course, aviation weather and manpower.

- **(Expected Effects)** Data-based scientific and prevention-oriented safety management is possible, and the accumulated data can also be used in various fields such as aircraft manufacturing and noise·carbon reduction.

▶ **MOLIT announced that the service provider for the demonstration project on the 'K-Drone System' was selected for increasing the safety of the drones and to support the expansion of the business area.**

- **(Main Contents)** K-Drone System is a drone traffic control system that enables drone flight plan approval, position information monitoring and the function of preventing the collision with nearly flight vehicles, and the service provider* will seek the method of applying and utilizing the communication equipment for identification of drone location and the web-based drone flight approval system in our everyday lives.

  * A total of 7 organizations are selected focused on the airport, urban area, long distance, ocean, etc.

- **(Expected Effects)** It is expected to solve the social issues caused by the illegal flight of drones near the airport and in the urban area, and to overcome the technical limitations such as concerns of collision with the obstacles or other flight vehicles during long-distance drone operation in the beyond visual line-of-sight flight.

< Utilization of Drones & Concept of Drone Traffic Control >
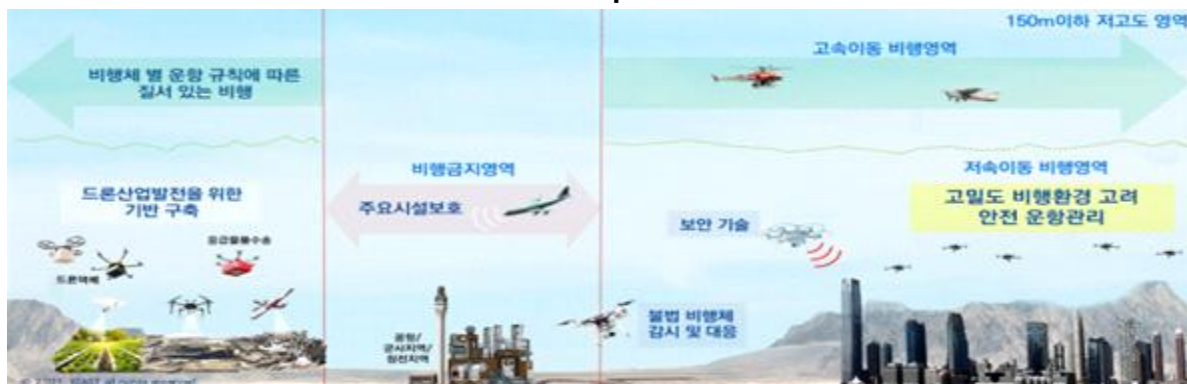
▶ **According to the '2020 Aviation Safety White Paper' published by the Ministry of Land, Infrastructure & Transport (MOLIT), a total of 493 insufficient matters were pointed out in 2020 as a result of performing regular inspection on domestic & international air transport service providers and foreign airlines.**

- In the case of domestic airlines, △Lack of standardization of the procedure by the airlines, △Insufficiency in compliance of safety regulation in the site, and △Insufficient airport manpower operation and GHA (ground handling agent) management state, etc. were pointed out.

- For the foreign airlines servicing in Korea, △Traces of oil leakage from the landing wheels, etc., △Paint being peeled off from the aircraft body, and △Erased marking on the emergency equipment storage box were pointed out.

 * (2019) Inspection performed in a total of 1554 times; 543 items pointed out (2020) Inspection performed in a total of 2,197 times; 493 items pointed out (Decreased 9.2% compared to the previous year)

< Status of Periodic Inspection & Improvements for Each Airline in 2020 >

구분	상시점검 횟수	개선실적			
		시정지시	개선권고	현장시정	계
**항공사	397	4	38	10	52
**항공사	264	1	39	10	50
**항공사	243	-	46	10	56
**항공사	239	-	48	15	63
**항공사	181	5	26	9	40
**항공사	63	1	9	7	17
**항공사	337	5	67	16	88
**항공사	137	-	16	10	26
**항공사	135	1	34	5	40
**항공사	122	2	46	6	54
**항공사	19	-	-	-	-
외항사	60	-	2	5	7
합계	2,197	19	371	103	493

Korea Aerospace Industries (KAI) Signed the Supply Contract on Surion-variant Coast Guard Helicopter (Whitesuri).

▶ **Korea Aerospace Industries (KAI) announced on signing the supply contract with Public Procurement Service (PPS) on August 9th on two Surion-variant Coast Guard Helicopters, Whitesuri (KUH-1CG) in the amount of approximately KRW 49.7 billion.**

- Whitesuri is a helicopter developed·remodeled to be appropriate for performing the coast guard missions such as maritime terrorism, maritime crime patrol and search & rescue activities, based on the Korean helicopter Surion, and the search radar for target detection on the ocean, electrooptic-infrared camera, hoist and searchlight, etc. are mounted to enable real-time site verification and daytime·nighttime search & rescue.

- Especially, new search radar (Osprey 30) is added for simultaneous detection up to 1,000 targets, which is expected to reinforce the maintenance of public order and the capabilities on the mission to prevent accidents.

International Status

Suffering from 'Hellfire' Around the World

▶ **The US and the Mediterranean countries are suffering great damage from the big forest fires that are uncontrollable due to the high temperature, dry weather and strong wind.**

- In the **USA**, the Dixie Fire in California that was the second largest fire in history and burned the area that is 4 times larger than Seoul was finally extinguished after 2 months (Damage of approximately 380,000ha).

- In **Greece**, the second largest island of Evia Island was covered in fire, and over 500 forest fires occurred in just few days. Sicilia and Sardegna on the southern region of Italy also suffered great damage from the forest fire.

- In **Turkey**, fire spread across the southern coast to burn the vast pine forest and farmlands into ashes, and the forest fire in Tizi Ouzou of Algeria on the northern region of Africa resulted in 7 deaths.

The US Acquired the First FAA Certification on the HUD System for General Aviation.

▶ **According to the Aerial Firefighting Magazine, the US MYGOFLIGHT's SKYDISPLAY™ announced that they acquired the FAA Certification on the SKYDISPLAY HUD (Head Up Display) System.**

- SKYDISPLAY HUD aligns the important flight information with the external view of the pilot, and provides the head-up guide signal based on the basic flight instrument information of the aircraft.

- HUD can be applied to even the small installation space in the cockpit through the next-generation display technology, and the weight, size and cost were reduced greatly.

- It is expected to reduce the workload of the pilot and improve the situational awareness greatly to enhance the proficiency of the pilot in all conditions and flight stage for improving the safety of the flight.

- The new function of the HUD system, EVS (Enhanced Vision System), can help the pilot to control the flight more easily even under bad weather conditions (very effective on flying at low altitude such as insect pest control, search and rescue).

▶ **The driven announced that the German aircraft manufacturer Volocopter completed the first test flight on the air taxi with the crew on board.**

 - The manned test flight lasted for 4 minutes, and the air taxi reached the height of 164 feet and a maximum speed of 29km/h

 - The initial prototype of VoloCity will make its debut in few years, and it is currently under the certification process by EASA (European Union Aviation Safety Agency) for commercial launching.

 - The official commercial debut of Volocopter will be in Singapore, and the plan is to provide the air taxi service in Singapore within 3 years.


UAV (Unmanned Aerial Vehicle)-IoT Network Can Help Quick Forest Fire Detection.   Source : AF Magazine

▶ **According to the Aerial Firefighting Magazine, it was informed that the terrestrial-based sensor paired with the UAV (Unmanned Aerial Vehicle) can provide quick forest fire detection information.**

 - Due to the high worldwide increase in the frequency and severity of the forest fire, there is a need for the technology that can help control the forest fire, and IoT sensor that can monitor the forest from the initial signs of smoke and heat is expected to help control the forest fire greatly.

 - While UAV is flying over the forest, the data will be collected from the IoT sensors distributed throughout the forest to detect the forest fire in a short period, which is expected to supplement the weakness of the existing forest fire detection system through satellite image (forest fire detection can be difficult depending on the weather condition).

 - Compared to the satellite image system, UAV-IoT network can only cover relatively small forest areas, so it is appropriate for detecting the forest fire near the forest of private houses or on the high-risk areas such as the national park.
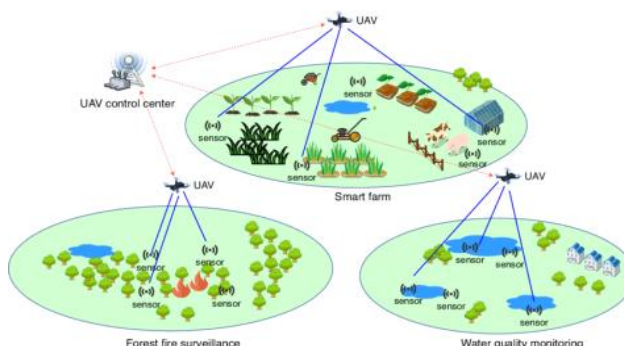
▶ **The Aerial Firefighting Magazine introduced that Heron UAV developed by the Israel Aerospace Industries is participating in the activities for extinguishing the forest fire in not only Greece, but also in Jerusalem.**

- Heron UAV collects various information to find the exact cause of the fire, and also plays the role of helping to predict the path of the fire.

  * Heron UAV can be operated up to 45 hours and reach a maximum altitude of 35,000 feet.

Russia's BERIEV BE-200 Aircraft Crashed in Turkey.

▶ **According to the Aerial Firefighting Magazine, the Beriev Be-200(RF-88450) aircraft from the Russian Navy crashed in the high mountains near Kahramanmaraş, Turkey during the mission on extinguishing the forest fire in August 14th, and 3 Turkish Forest Inspectors and 5 Russian Crew Members were found dead.**

- The aircraft was dispatched from Russia to support Turkey which requested international support since the recent occurrence of the large forest fire.

< Beriev Be-200 Aircraft >   < Image of the Accident >

Greece Takes Efforts for Modernization of the Aerial Firefighting Fleet Since the Record-breaking Fire Season.

▶ **The Aerial Firefighting Magazine introduced the announcement by the Greek Parliament on the plan for investing EUR 1.7 billion on the modernization of aerial firefighting capabilities.**

- Several aircrafts for extinguishing the forest fire will be invested additionally, numbers of aircrafts and helicopters possible for use were increased for this year's forest fire period that resulted in more damage than ever.

  * Thanks to Russia and nearby countries' support, Greece currently manages a total of 74 firefighting aerial vehicles (42 aircrafts & 32 helicopters).

Search & Rescue (SAR) Drone Can Save Lives by Using AI.

▶ **According to Fire Aviation, Russian IT company Radar MMS introduced the SAR Drone that can rescue the people in the risk of drowning after the ship accident or helicopter crash accident.**

- The SAR drone uses AI to quickly search for the people drowning from the shipwreck and to drop lifesaving instrument for emergency rescue.

  * The UAV (Unmanned Aerial Vehicle) is mounted with a technology, which identifies the person among the remains of the shipwreck floating on the water (All objects can be detected even in bad weather such as rain or fog, etc.).

Water Box (PCADS) Used for Extinguishing the Forest Fire in Israel

▶ **Fire Aviation introduced that the Water Box (PCADS) was dropped through the C-130 aircraft to extinguish the large forest fire in Jerusalem.**

- PCADS (Precision Container Aerial Delivery System) is composed of a container with the cardboard, lamination, plastic pouch and dozens of yards of string, and one water box can be filled with about 250 gallons of water or flame retardants

- The water box was designed to be loaded in the cargo planes such as C-130 or C-27, and more than 2,000 gallons of liquid can be dropped at once.

- While the water box is being dropped from the aircraft, the container cap connected with 4 strings will be separated to operate like a parachute, and the strap applies pressure to the plastic pouch to disperse the liquid.

- Expensive modification is not required to use the aircraft, and the military cargo plane can also be used. It is expected to enhance the fighting power by increasing in the number of aircrafts possible for performing the mission of aerial firefighting.

 * The cost for modifying an aircraft for the purpose of aerial firefighting is very high, and when the modification is complete, the aircraft can be operated limitedly only for the aerial firefighting mission.

- The existing aircrafts have a limit on visibility while flying over the forest fire full of smoke in the daytime, but thanks to the PCADS, water can be dropped on the target from the safe altitude (high altitude) when the GPS coordinates are provided to the pilot (Missions can also be performed in the nighttime).

Safety Knowledge

「**AS9110**」**, Quality Management System for the Aviation Maintenance Organization**

▶ **AS9110 developed by the International Aerospace Quality Group (IAQG) is a standard quality system that was established to reinforce the competitiveness of the global aviation industry.**

< Certificate of Approval received by Forest Aviation Headquarters in 2021 >

- **AS 9110 Certification System** is an international aircraft quality management system developed by the International Aerospace Quality Group (IAQG) in 1998 by specializing the procedures that are required in the aerospace field, based on the ISO 9001 applied to all industrial fields.

- This certification system is classified in detail into aircraft manufacture · maintenance · parts management, and **Forest Aviation Headquarters** maintains the AS9110 Certification System in the aircraft maintenance field from **2014.**

- AS9110 Certification is currently acquired by main organizations in the aviation sector such as Boeing, Airbus, ROKAF (Republic of Korea Air Force) and AMO (Aircraft Maintenance Organization), and especially among the national agencies operating aircrafts, **Forest Aviation Headquarters is the only agency that received the AS9110 Certification.**

* AS9100 (Aircraft & Parts Manufacture), **AS9110 (Aircraft Maintenance)**, AS9120 (Aircraft Parts Distribution)

《**Comparison of Main Differences Between ISO9001 and AS9110**》

Classification	ISO9001	AS9110
Year of Establishment	1987	1999
Purpose	Improvement of customer satisfaction through consistency of operation on the improved quality management system and consistent improvement	Standard quality system standard for the global aviation industry established for improving the quality and to reinforce the competitiveness such as cost reduction, etc.
Main Contents	Comprehensive Quality Management System	ISO9001 + Expertise in Aviation (90 items added)
Certification Target	All Industries (Includes the Aviation Sector Partially)	Aviation Sector
Acquired Companies (Domestic)	Many General Companies	Korean Air, RH Focus, UI Helicopter, Korea Aviation Engineering & Maintenance Service (KAEMS), ROK Air Force, etc.

※ **Quality Management System AS9110 is a more detailed and reinforced system compared to ISO9001.**

We welcome your opinions for the production of the 「Aviation Safety Briefing」 to support the forest aviation safety. (Phone or On-Nara Mail Service)

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