Preserve Canada's Strategic Surveillance Capability

A Study by the Maritime Air Veterans Association

Introduction

Canada's geography has for most of our history spared our nation from armed conflicts on Canadian soil. During the Cold War the advantages of our geography were buttressed by our participation in NORAD and NATO. NORAD, a joint American-Canadian integrated air defence network has successfully deterred air threats against North America. Less well known is that our geography also presents Canada with a massive three-ocean frontier to defend. The maritime frontier consists of the world's longest coastline (243,000 km) and an Arctic Archipelago consisting of 36,562 islands stretching 2,400 km across the north of the Canadian mainland. During the Cold War the Soviet Union's massive build-up of submarines in the North Atlantic presented the greatest maritime threat to Canada and its allies. The Soviet Union's rapidly expanding submarine fleet was capable of interdicting the sea lines of communication between North America and Europe and launching Submarine Launched Ballistic Missiles (SLBM) against North American industrial centres.
In 1949, Canada joined NATO, a multilateral collective defence alliance, to counter the Soviet threat in Europe and the Atlantic Ocean. The thrust of NATO's Atlantic priority was to maintain freedom of the seas, which was essential to solidifying the post-war territorial and political independence of its European members. As part of its NATO obligations Canada built on the RCN's Second World War anti-submarine warfare (ASW) experience by undertaking a massive program to build a modern fleet of ASW capable destroyers to help protect NATO's sea lines of communication. Canada also contributed a fleet of maritime surveillance aircraft to safe guard the vast NATO area of responsibility assigned to Canada in the Western Atlantic. The RCAF needed to reconstitute its former Eastern Air Command ASW and convoy escort squadrons, which had helped turn the tide against German submarines during the Battle of the Atlantic. However, most of the Second World War maritime aircraft had been sold for scrap during the post-war downsizing and a new aircraft capable of meeting NATO's ASW surveillance requirements was needed.

The Argus and the Cold War

The RCAF tuned to Canadair Limited in Montreal (now Bombardier) to build a maritime surveillance aircraft with sufficient range and endurance to patrol Canada's vast NATO area of responsibility. The resulting "Argus" four-engine maritime surveillance aircraft, designed and built by Canadians, was specifically tailored to conduct surveillance over Canada's ocean area of responsibility. Its exceptional range and endurance of more than 30 hours far exceeded other NATO aircraft giving it the ability to patrol over any region of the North Atlantic. Operationally, the Argus was at the forefront of Canada's maritime defence needs. Its two large weapon bays, advanced technology navigation and ASW sensor systems were envied by our allies who acknowledged that, at its introduction, the Argus was NATO's most capable ASW aircraft. The Argus demonstrated that Canada had the national intellect and industrial capacity to design and build one of the world's most sophisticated aircraft.

During the Cold War the Argus contributed to the strategic maritime balance by routinely conducting random anti-submarine patrols in Canada's NATO area of responsibility. It was at the forefront of Canada's maritime defence, detecting and reporting vessels of interest to maritime headquarters for further investigation. One of the by-products of

these patrols was the reporting of all surface traffic encountered, including the regular flow of Soviet cargo ships en route to Cuba. Analysis of aerial photographs revealed that the ships were clandestinely transporting ballistic missiles to Cuba, which spawned the politically intense Cuban missile crisis in 1962. Canada provided ships and aircraft to augment a barrier stretching from Newfoundland to the Azores established by the United States to track and deter Russian ships. Fully armed Argus', with their exceptional endurance, were the key players from the start. It was the only aircraft with sufficient endurance to conduct eight-hour patrols at the Azores end of the barrier 1,600 km from their home base. It was the Argus' finest hour in which it had played a key role in defusing the Cuban missile crisis that had brought world to the brink of war. The Argus had earned Canada international admiration and respect as a capable and reliable ally in the time of crisis.

The Argus worked closely with the U.S. Navy's Sound System Underwater Surveillance (SOSUS) to provide Canada's most effective strategic ASW surveillance capability in the Canadian area of responsibility. Similar to NORAD's North Warning System (NWS) of radar sites across the Canadian Arctic to warn against air attack, SOSUS, jointly manned by Canadians and Americans, consisted of arrays of hydrophones mounted on the ocean floor. The Argus-SOSUS team proved remarkably effective in providing long-range warning of Soviet nuclear-armed submarines approaching the coasts of North America. Similar to the NWS alerting NORAD aircraft to intercept unidentified aircraft, SOSUS alerted maritime aircraft to investigate Soviet nuclear-armed submarines approaching North America. The Argus' attributes complemented SOSUS better than any other reaction vehicle; it had the range and speed to match SOSUS's long detection ranges and its endurance enabled the Argus to conduct surveillance on submarine activities in Canadian waters for longer "on-top" times than any other aircraft of its era.

The Argus' long range and endurance also served Canada's domestic surveillance needs by patrolling Canada's east coast continental shelf, which is the largest in the world and the richest in natural resources. The Argus patrolled this vast area to ensure that Canadian sovereignty and that marine regulations were respected in our territorial waters and in our Exclusive Economic Zone (EEZ). Among the extensive foreign fishing fleets, the Warsaw Pact fishing vessels had the largest presence and were of particular interest because in times of increased tension they would have been a valuable intelligence gathering asset and an innocuous re-supply resource for naval combatants. These fleets also harboured electronic intelligence (ELINT) vessels disguised as fishing trawlers that extracted information from Canada's full radio spectrum including marine and military communications. The Argus was the major contributor to the compilation of the Soviet presence off our coast. Knowing the extent of this latent threat off our east coast would have been critical if Cold War tensions had escalated into open hostilities.

The Argus also played an important role in providing a Canadian presence in our Arctic. Its range and endurance enabled the aircraft to be scrambled from bases in southern Canada to respond to search and rescue emergencies or to react to unidentified sightings in Arctic waters. The Argus also conducted patrols in Arctic waters with scientists from the Department of the Environment on board to study ice formations. Perhaps the most significant activity was overflying remote Inuit settlements to show a Canadian presence by talking via radio to the RCMP detachments and the residents who gathered to see a large four-engine aircraft roaring above their rooftops sporting a Canadian flag on the tail.

Aurora Ocean Surveillance

By the early 1970s the Argus was obsolescing and difficult to maintain; and modern submarine technology had outpaced the capabilities of the Argus' ASW sensors. Since the defence of Canada's maritime areas depended on being an effective contributor to NATO's balance of power in the Atlantic, the Argus had to be replaced with a more capable aircraft. After an exhaustive study of candidate aircraft, Canada selected the four turbo-prop engine Lockheed Aurora. Similar to the Argus the Aurora was a unique Canadian design and was a hybrid of two ASW aircraft in service with the U.S. Navy. The Aurora inherited its sizable weapon load, long range and endurance from the Lockheed P-3C Orion and its state-of-the-art avionics and ASW sensors from the Lockheed S-3A Viking. When introduced into service in 1980, the Aurora was acknowledged by Canada's allies as one of the most capable maritime surveillance aircraft in the world; the Aurora immediately proved its metal in 1981 by winning the coveted Fincastle Trophy emblematic of ASW supremacy among Commonwealth maritime air forces.

The Aurora conducted the same type of maritime surveillance missions as its Argus predecessor except that it was much more capable of collecting intelligence on Soviet submarine incursions into the North Atlantic. The Aurora's advanced capabilities often led to NATO tasking for high priority surveillance missions to gather sensitive intelligence that was shared with our allies. According to the intelligence community maxim that one must contribute in order to receive, Canada, in turn, gained access to "five eyes" intelligence; a process in which Canada had formerly been quietly excluded because Argus sensors lacked the resolution to collect or take advantage of the sensitive data.

Because of the increased Soviet armed submarine presence off the coast of North America during the 1980s, Aurora surveillance cued by SOSUS played an even more significant role in continental defence. The Americans were keen on Canadian participation with SOSUS because the great circle route from Soviet submarine bases near the Barents Sea to the American eastern seaboard passed through the Canadian NATO area of responsibility. The Americans were especially interested in the modus operandi of Soviet submarines in the Labrador Sea and off the American eastern seaboard, far beyond where their legitimate defence needs rested. Submarines by their very nature are clandestine vehicles; therefore, surveillance was conducted covertly to prevent the submarines from being alerted and obfuscate the true nature of their missions in Canadian waters. Because submarines are unaware of their presence, aircraft have the advantage of stealth during sub-surface surveillance, whereas the noise from ships' screws and sonars alert the submarine to their presence. Aurora aircraft arguably detected more Soviet penetrations of Canadian frontiers than did their NORAD brethren, but because the ASW missions were conducted covertly Canadians were unaware of the Aurora surveillance missions as they received none of the publicity or visibility afforded unclassified intercepts of Soviet aircraft by their NORAD brethren.

Aurora Federal Surveillance

National Defence Headquarters (NDHQ) frequently tasked the Aurora for surveillance missions outside the maritime defence realm. When intelligence sources indicated that Soviet ice stations were drifting through the Canadian Arctic area of responsibility, NDHQ tasked Auroras to locate and track the stations to gain further intelligence about their activities and to determine if their presence contravened Canadian sovereign interests. In 1997 and 2014, NDHQ tasked Auroras to monitor the devastating Manitoba floods. The Auroras' sensors provided Emergency Measures planners with composite pictures of the flooded areas and provided flood response teams real-time guidance from overhead around closed roads and washed out bridges to reach critical areas.

The Auroras' military maritime surveillance capabilities also routinely supported other federal government departments. Surveillance of adjacent oceanic waters extended Canada's domestic reach beyond its shores to safeguard its sovereignty by monitoring commercial shipping compliance with Canadian laws and marine regulations and to ensure that no activity was contrary to Canada's well being. Specific support included Auroras:

- Providing more than 1,300 surveillance hours annually to the **RCMP** in support of counter narcotic operations. Numerous successes included covert surveillance of drug laden "mother ships" that off-loaded tons of illegal drugs to smaller fishing boats, which in turn landed their contraband on the remote coastlines of the Atlantic Provinces and British Columbia.

- Providing more than 1,000 surveillance hours annually to the **Department of Fisheries and Oceans.** Such surveillance detected unusual concentrations of Spanish vessels on the Grand Banks that led to resolution of the "Turbot" fishing dispute between Canada and Spain in 1995. On the West Coast Aurora surveillance provided evidence to North Pacific fishery regulators that resulted in the demise of the environmentally disastrous drift net fishing activity.

- Maintaining a continual vigil for ships discharging illegal pollutants at sea during routine maritime surveillance patrols. The Auroras reported more than 85 percent of the total pollution violations to the

Department of the Environment. Similarly, during Arctic patrols Auroras reported ice conditions to the Department of the Environment, which used the information to predict the formation of icebergs that eventually drifted east of Labrador and Newfoundland posing hazards to shipping lanes and oilrigs.

- Becoming very adept at recognizing routine patterns of maritime activity during normal surveillance operations. Aberrations to the established status quo such as merchant vessels off the usual shipping routes aroused suspicion and instigated further on the spot investigation. On several occasions the unusual behavior of rogue vessels resulted in the apprehension of more than a thousand **illegal immigrants** attempting to land clandestinely on the shores of British Columbia and the Maritime Provinces.

- Participating in **Operation Caribbe** in 2006, a U.S. led multi-national campaign to cut organized crime's drug supply lines in the Caribbean Basin, the Gulf of Mexico and the eastern Pacific Ocean to American and Canadian markets. The Canadian contribution, including Aurora surveillance, was formalized in 2010 with the signing of a Memorandum of Understanding between DND and the U.S. Department of Homeland Security.

Aurora NATO Surveillance

Auroras also participated in several high-profile expeditionary operations that tangibly projected Canadian foreign policies. During such operations Auroras typically "Punched above their weight"; compared to other coalition air forces the number of Aurora sorties flown was well beyond the proportion of the number of aircraft contributed. During Operation Sharp Guard, 1992-1995, Auroras participated in the NATO-led blockade in the Adriatic Sea to prevent the illegal importation of arms into Yugoslavia, Croatia and Bosnia. From 2001-2003, during Operation Apollo, the campaign against terrorism in Afghanistan, Auroras flew more than 500 maritime patrols to extend the surveillance area of patrolling naval vessels in the Arabian Sea approaches to the Persian Gulf. In 2009, two Auroras specially fitted with Canadian-made Applanix cartographic cameras deployed to Afghanistan to map over 100,000 km of terrain. The photography provided the first accurate maps of uncharted regions in Afghanistan that were desperately needed for coalition land operations.

Aurora Modernization

By the mid 1990s the fleet of 18 Auroras was losing its operational edge as its obsolescent avionics and sensors were losing their effectiveness against the latest more technically advanced and diverse targets. Also, heavy tasking of the small fleet size was causing premature structural fatigue; Auroras were flying at a 50 percent greater rate than the U.S. Navy's similar P-3C fleet. In addition to accelerated airframe fatigue, corrosion in the wings and empennage raised serious concerns about early expiration of the Auroras' life expectancy. Spare parts were also becoming difficult to obtain because original equipment manufacturers were no longer supporting obsolescing systems.

Operational deficiencies were addressed though the Aurora Incremental Modernization Program (AIMP), which was a four-phase multi-year program to replace the Auroras' avionics and sensors with state-of-the-art systems. Structural integrity concerns were remedied through the Aurora Structural Life Extension Program (ASLEP) in which components of the wings and empennage were replaced. In 2007, the government approved the AIMP/ASLEP for only ten of the 18 Auroras, a draconian reduction in surveillance capability for a nation with the world's longest coastline. When the RCAF advised that it could not fulfill all the proposed tasks in the Canada First Defence Strategy (CFDS), the number of Auroras slated for AIMP/ASLEP modifications was increased to 14 aircraft. However, the additional four Auroras were approved for modification "for" but not "with" the AIMP new sensors. This effectively left the RCAF with ten operational Auroras, but with the flexibility to rotate the sensors among the 14 aircraft to sustain ten operationally available aircraft during extended maintenance periods. Considering an optimistic 70 percent serviceability, only seven Auroras will be available

to patrol the world's longest coastline. To bring the total to 18, the remaining four Auroras need to be modernized quickly before the production line for replacement wings and tail planes is closed. Otherwise, budgetary and manning constraints will force the RCAF to scrap the last four Auroras. The AIMP/ASLEP modifications to the currently scheduled 14 Auroras are expected to be completed by 2021, extending the operational availability of the modernized Auroras from 2020 to 2030.

The Aurora modernization program is a Canadian innovation success story, with Canadian industry delivering a world-class capability. The program is creating highly skilled jobs across the country, designing and manufacturing cutting-edge technologies, including submarine acoustic detection systems from General Dynamics Canada; synthetic aperture radars from MacDonald Dettweiler and Associates in Vancouver; electro optical systems from L3 Wescam through Lockheed Martin Canada; submarine Magnetic Anomaly Detection systems from CAE in Montreal; computer systems integration by General Dynamics in Ottawa; and installation work for the avionics/sensor modernization and structural life extension projects performed by IMP Aerospace in Halifax.

Aurora Overland Surveillance

The modernization program vaulted the Auroras' maritime surface and sub-surface surveillance capabilities to the forefront as demonstrated during RIMPAC 2015, a multi-national exercise in the Pacific; the U.S. Navy acknowledged that the Aurora's sensors exceeded the performance of sensors in the new Boeing P-8, which is just being introduced into service. Interestingly, the new sensors' outstanding Intelligence, Surveillance and Reconnaissance (ISR) capabilities proved to be as effective overland as at sea. The overland capabilities were first tested in several domestic operations. In 2009, an Aurora participated in Operation Tatou to provide security surveillance for the Commonwealth Heads of Government Summit in Trinidad. In 2010, during Operation Podium Auroras provided continual surveillance of the coastal approaches to the Vancouver Olympics to detect possible terrorist activity. Again in 2010, Auroras tasked to Operation Cadence provided security surveillance of Lake Ontario and overland approaches around Toronto to protect G8/G20 Summits.

Having developed their domestic overland ISR capabilities, the modernized Auroras made their expeditionary debut in 2011 when two aircraft deployed to Sigonella, Italy (Sicily) to participate in Operation Mobile, a NATO enforced maritime embargo and no-fly zone over Libya. Auroras initially patrolled Libya's Mediterranean coastline working with naval vessels to enforce the arms embargo and employing their long-range sensors to collect inland intelligence. When the Libyan air threat was declared benign Aurora surveillance shifted overland where its endurance allowed the aircraft to loiter covertly over areas of interest for long periods, providing intelligence specialist detailed pictures of troop movements, traffic patterns and other indicators of everyday life. Higher headquarters praised Aurora imagery products and the Aurora became the preferred ISR platform. The Aurora imagery was used to assess bomb damage and to locate targets for future bombing missions. Later in the operation, using real time sensor imagery, Auroras were able to "talk" coalition fighter-bombers onto their assigned targets. During Operation Mobile, the Aurora had proved to be equal to or better than other coalition ISR vehicles.

In 2014, Canada contributed an Air Task Force (ATF) to Operation Impact to halt radical ISIL forces from overrunning Iraq and Syria. The ATF, based in Kuwait, provided coalition forces six CF-18 fighter-bombers supported by a CC-150 Polaris tanker and two modernized Aurora ISR surveillance aircraft. In 2016, the newly elected Canadian government attempted to withdraw the ATF, however, coalition leaders successfully argued to retain the Polaris tanker and two Auroras in theatre. The Polaris tanker was a force multiplier for the fighters and the two Auroras had proven to be irreplaceable ISR aircraft. The Auroras performed the same surveillance role as in Libya, covertly loitering for long periods over areas of interest to locate potential targets and gather information for intelligence specialists and coalition mission planners.

Aurora Replacement

The family of Canadian surveillance aircraft has uniquely Canadian pedigrees. The Argus was totally designed and built in Canada to meet Canadian needs. Its Aurora replacement, although American built, was a unique design for Canada that incorporated the latest avionic and sensor technologies that restored Canada's reputation as leader in maritime

surveillance. As the baseline Aurora aged it was replaced by the modernized Aurora and its latest generation maritime surveillance technologies, which have proved equally capable overland, making it the preferred ISR aircraft in the conflict in Iraq and Syria. However, the Aurora's life expectancy has been stretched to the limit and is predicted to expire in 2030. Canada's surveillance capabilities are a national asset that must be preserved. A new surveillance aircraft will be required to meet resurgent state-based threats in an uncertain world.

Russia is substantially expanding its surface and sub-surface naval forces. Russian submarines have resumed deploying to the coast of North America in numbers unseen since the Cold War. These submarines are conducting mock exercises that explicitly identify NATO as the enemy. Russian submarines and aircraft are being armed with new long-range precision cruise missiles that can strike North America, or complicate access to the Baltic and East Mediterranean Seas. China is also building up its navy, developing capabilities likely aimed at blocking access to the waters around Taiwan and the East and South China Seas. Russia and China appear to be pursuing anti-access / area-denial capabilities that threaten unfettered access to the sea lines of communication and world trade. Canada's interest in the Asia-Pacific results from our trade ties to the region and our desire to be able to play a constructive role in the region in the event of a crisis. Australia is concerned about access to the Pacific waters around China, while Norway is concerned about Russian activity in the Arctic. Both regions are of significant concern to Canada. Canada's interest in the Arctic stems from the fact that much of Canadian territory is in the Arctic, where we will want to exercise surveillance and control. The challenge posed by Russia is compounded by Arctic melting freeing navigable waters and resulting interest in the region by non-Arctic countries, notably China, which has commissioned its second polar-class icebreaker.

These emerging threats can best be addressed militarily by maintaining a robust ASW capability, featuring submarines and long-range maritime surveillance aircraft. To this end, Britain, the United States, Australia and Norway are investing in new submarines and long-range patrol aircraft. Submarines are beyond the scope of this paper, however, Canada, too, has a vested interest in acquiring a highly capable ASW aircraft.

UAVs versus Aircraft

Canada has a number of equipment options to sustain a next generation maritime surveillance capability; one of the options includes unmanned air vehicles (UAV), which are cheaper than aircraft. The U.S. Navy is currently establishing a Broad Area Maritime Surveillance (BAMS), which consists of both UAVs and maritime surveillance aircraft. UAVs have the endurance to loiter on station at medium or high altitudes for significant periods of time and have sufficient payload to carry a broad array of sensors. Due to their 'persistence', they are ideally suited to covering a broad area for prolonged periods of time. However, there are significant problems with UAVs; the signals to control them are insecure, operations in the Arctic are limited because of the lack of satellite communications above 70 North latitude, sensor performance in harsh weather (icing) over the North Atlantic and North Pacific is unproven, and there are unresolved legal issues governing autonomous flight in Canadian domestic and oceanic airspace. More importantly, UAVs have no sub-surface surveillance capability.

As demonstrated by the modernized Aurora, aircraft also have a significant surveillance capability with the added advantage of greater agility, flexibility and versatility in tasking over UAVs. Aircraft are able to sense and analyze information on scene, provide command and control of other forces, including UAVs, and deliver immediate kinetic effects when required. The deterrence value and psychological effect of a low flying aircraft over a target of interest is greater than that of a UAV.

Undoubtedly, a mixed fleet of aircraft and UAVs would provide Canada the most cost effective surveillance capability. UAVs provide routine large area surveillance whereas aircraft have the ability to investigate targets worthy of further reconnaissance or require on-scene intervention. There are a number of surveillance aircraft available to replace the Aurora. The U.S. Navy is currently replacing its P-3C fleet with the newly developed P-8 Poseidon, a twin jet-engine aircraft based on the Boeing 737-800 airliner, designed to operate in conjunction with UAVs in the BAMS network. It has maritime and overland surveillance sensor capabilities and a weapons payload similar to the modernized Aurora, except that the P-8 will be viable for the next 40 years or more. More importantly, the P-8 has the endurance and range to

patrol vast remote areas over land and sea. It is the most capable aircraft available to meet Canada's endurance and range requirements. After in-depth analysis, Britain, Australia and India selected the P-8 as the best aircraft to meet their national requirements, which are similar to Canada's. The P-8 acquisition raised affordability issues (as did the Aurora when it was first acquired), but its broader capabilities rendered it a more cost effective choice over the seemingly more affordable alternatives.

European aircraft manufacturers are offering lower cost alternatives to nations who cannot afford or require the capabilities of the P-8. Maritime versions the Spanish CASA CN-235 and European Aerospace and Defence C-295 Persuader series are being proposed for surface surveillance with a limited ASW capability. However, as currently configured these aircraft lack the range and endurance to patrol the far reaches of Canada's Arctic and ocean areas of responsibility.

Canada's Bombardier has also entered the lower cost maritime surveillance aircraft market. Boeing has selected the Challenger 605 business jet as its low cost maritime platform. Bombardier has also modified a number of Dash 8/Q-series turboprops for foreign coast guards and the U.S. Border Protection Agency that could be modified to provide a *"lightweight"* Aurora. If Canada aspires, as it should, to an Aurora replacement with the long range and endurance necessary for current national and expeditionary mission profiles, the aircraft requires the space and capacity for a full-scope mission avionics suite. This includes a robust ASW capability, which is integral to conducting credible surface and sub-surface surveillance for sovereignty-protection and awareness of activities in our adjacent oceans. The replacement aircraft should be capable of carrying an effective armament payload and adequate quantities of droppable search stores (i.e., sonobuoys and SAR kits), and have the growth potential to accommodate future demands. For an aircraft to satisfy the above criteria, it is difficult to comprehend how "smaller, more affordable" turboprops and business jets, no matter how *extensively* or *expensively* modified would suffice.

An Aurora replacement based on Bombardier's C Series airliner could prove a more tempting platform. This is an interesting concept not without precedent. In the 1950s, Bombardier (Canadair) designed and manufactured the Argus maritime surveillance aircraft and installed a suite of effective ASW sensors. The scenario is similar today, Bombardier has built the C Series airliner with the requisite range and endurance; and a state-of-the-art mission suite designed and built by Canadian industry, could be migrated from the modernized Aurora to a maritime version of the C-Series aircraft. This would undoubtedly introduce additional technical risk, substantial non-recurring expenses and potential logistical support challenges if the RCAF was the only customer for a maritime variant. Further investigation is required to determine if the life-cycle costs would be comparable to acquiring the P-8; certainly cutting-edge technology production for the Canadian aerospace industry and high-tech jobs for Canadians would prove attractive.

Conclusion

Although Canada's geography has insulated our nation from armed conflicts on our soil, maritime surveillance has significantly extended the geographic boundaries beyond our shores to alert Canadians to military incursions and infringements to our sovereignty. Canada's expertise in domestic surveillance led to the U.N. and NATO requesting Canada to contribute surveillance aircraft to expeditionary operations, thereby fostering international stability by defusing regional conflicts and projecting Canadian foreign policy interests abroad. In all its expeditionary endevours Canada's surveillance aircraft have exceeded operational expectations that have been lauded by our allies.

Strategic surveillance (ASW and ISR) is a national asset that has protected Canada for the past 65 years; this asset must be broadened and preserved by 2030 with a capable replacement surveillance aircraft and/or UAV to not only ensure Canada's future well being but also earn Canada a voice around the tables of international decision makers.

Recommendations

It is recommended that the AIMP updates and the ASLEP life extensions be completed on all 18 Aurora aircraft.

It is recommended that RCAF manpower and funding be increased to restore the Aurora fleet to its original 18 aircraft capability.

It is recommended that planning be initiated now to replace the Aurora fleet by 2030 with a full ASW/ISR capable aircraft with sufficient range and endurance to meet Canadian strategic (sub-surface and overland) surveillance requirements. Such planning should consider the possible development of a maritime version of the Bombardier C-Series airliner in the same manner that Canadair developed the Argus from the Bristol Britannia airliner.

R.D. Daly
Brigadier-General (Retired)
President
Maritime Air Veterans Association

E.S.C. Cable
Colonel (Retired)
Strategic Studies Coordinator
Maritime Air Veterans Association