

AVS 481 Final Paper: Modern Seaplane Air Carrier Operations

AVS 481

Final Paper

Modern Seaplane Air Carrier Operations

Brian Bonnell

Lynn University

Modern Seaplane Air Carrier Operations

Introduction. Commercial travel has lost its glamour. Gone are the days of travelers dressing in their best suits, sipping cocktails and dining on fine meals served by immaculately uniformed stewardesses. Now many travelers see commercial air travel as equivalent to riding on a Greyhound bus (Daley, 2014). But there is a sector of aviation where the romance is still alive. Stepping onto a seaplane, one cannot help but harken back to the days of the bush pilots. A seaplane can get a passenger quickly to places unserved by any other form of travel. But what is the place of seaplane charter companies in the modern aviation landscape? Is it too niche a mode of transportation to survive? What challenges do the modern seaplane companies face? And what role will seaplane travel play in meeting the mobility requirements of the future?

Through a review of the history of commercial seaplane travel, we will explore the heritage of the modern practitioners. Then we will dig into the regulations and see what is different for seaplane operations. Next we will look at several examples of commercial seaplane operations, both domestic and international. Finally, we will look at the example of Chalk's Ocean Airways, and see what we can learn from the downfall of a once-revered airline. In closing, we will review what we have learned of the challenges facing seaplane airlines, and see what conclusions we can draw on the future of the sector.

History of Commercial Seaplane Travel. After the Wright Brother's first flight, many innovators following in their wake began exploring different applications for the new technology. In 1910, Henri Fabre flew his Hydravion from the Seine River, opening the door to further iterations from early aircraft manufacturers such as Glenn Curtis, who produced an amphibious version of one of their early biplanes (Taylor & Munson, K, 1976). The military application of these early examples was self evident, and the armies of several nations early on

invested in pontoon and boat-type seaplanes, primarily for the purpose of reconnaissance. As with many technologies, once a military application was discovered, advancements came quickly. By the 1930s, capitalizing upon the rapid technological iteration that came with the use of seaplanes during World War 1 and the more capable, reliable seaplanes that came to exist as a result, seaplane travel became a viable way for airlines to reach global destinations (Aviation Triad, 2018).

The flying boats were the forbearers of modern day international airline routes. Exemplified by the PanAm Clippers, these massive, gleaming, many-engined craft with their ships' hulls and immense wingspan, connected travelers to destinations once only reachable by slow oceanic routes. PanAm Clippers carried passengers to China, Hawaii, throughout Latin America, and beyond. Now businessmen, celebrities, spies, and royalty could cross the oceans in luxury, in a fraction of the time. These Clipper routes phased out as direct flights came available with the development of jet aircraft. But in their golden age, the flying boats were instrumental in aviation becoming the global network it what it has become (Webber & Dodson, 2018).

Less glamorous but equally adventuresome, many postwar fliers found work as bush pilots in places such as Alaska, the Rockies, and the Pacific Northwest. To reach destinations in this trackless wild, float planes offered the capability to land on the numerous lakes and rivers. While less populous than ports of call such as New York or Hong Kong, the wilds of Alaska and Canada served as an ideal testing ground for how small, durable aircraft could reliably carry people and cargo to place that were otherwise practically unreachable. Pilots may depart from a well-established, urban airfield or seaplane base in Anchorage, and in minutes find themselves entirely isolated. If their aircraft experienced mechanical issues at one of their remote

destination in the interior or far north, the pilots would need enough of a working knowledge of their aircraft to be able to get the engine running enough to get it back home. If an aircraft were grounded in one of these destinations, it may be months before the pilot could make it home via overland routes. But despite these risks, the rugged bush-pilot pioneers found logistical models that kept their aircraft airborne and remote camps and villages supplied and connected to civilization (Rearden, 2009). This ability to adapt to ever changing conditions endures in modern seaplane operations, and is a hallmark of what sets them apart from traditional air carriers.

Regulations. Like inclement weather or rough waters, a challenge seaplane operators can count of facing are ever-evolving federal and international regulations. Aside from Federal Aviation Administration (FAA) rules, many seaplane carriers fly in the vicinity of or across international borders. To retain the right to operate in these places, pilots and managers must ensure compliance with all local regulations. In the air, the International Civil Aviation Organization (ICAO) lays out rules generally overlapping with the Federal Aviation Regulations (FARs) that should resolve most potential regulatory conflicts. For all of the U.S.-based Operations we will discuss, the most relevant regulations are Title 14 of the Code of Federal Regulations parts 23 (Airworthiness Standards: Normal Category Airplanes), part 25 (Airworthiness Standards Transport Category Airplanes), part 91 (General Operating and Flight Rules), part 121 (Operating Requirements: Air Carriers) and part 135 (Operating Requirements: Commuter and on Demand Operations). Part 91.115 (Right-of-way Rules: Water Operations) serves as a bridge to Title 33 CFR part 83, U.S. Inland Navigation Rules. Title 33 CFR part 83 aligns with and supplements the 1972 Convention on International Regulations for Preventing Collisions at Sea, also known as 72 COLREGS. This international agreement governs sea traffic

rules in most of the world, and seaplane operators are subject to its' guidelines as soon as their pontoons or hull touch the water (U.S. Coast Guard, 2020).

Despite the international alignment regarding navigation rules, a seaplane pilot must be aware of the rules and customs prevailing at their destination. Many seaplane surface operations, such as beaching and docking, are non-standardized, and may be subject to fees or permits on a location-by-location basis. These rules aren't easily searched and are usually not marked on any aeronautical or maritime charts. Some may even be informal or unofficial, but if not adhered to, could result in an operation losing their ability to travel to that destination. All of these complex and sometimes conflicting rules are only the ones regulating getting to and navigating around a destination. This brief overview serves to illustrate how operators are obligated to abide by both the formal regulations and local customs and peculiarities unique to this type of flying. With this frame of reference and the historical perspective we gained earlier, we can now investigate several contemporary seaplane charter airlines with a more complete understanding of their operating environment.

Tropic Ocean International. Tropic Ocean International is a Fort Lauderdale, Florida based Part 135 operation flying amphibious float-equipped and traditional land Cessna Caravan turboprop passenger aircraft. Founded in 2009, the company has a fleet of 13 aircraft, and has steadily grown it's route coverage to 72 destinations. Most recently, Tropic added the island of Bimini to it's list of destinations, which was the marquee destination for the historic Chalk's Ocean Airways, Tropic's South Florida predecessor (FlyTropic.com, 2021).

Tropic offers capabilities few, if any else in Bahamas and Caribbean can offer. A Tropic flight may be a routine passenger flight from the Miami Seaplane Base to Nassau, dropping day trippers off at the docks for lunch. Or it may be a private charter, landing at a completely

secluded and private beach otherwise only reachable by a long boat ride. It could even be resupplying a yacht underway at sea. Importantly, Tropic serves cargo customers throughout the Caribbean, a region with growing supply-chain demands but limited distribution options due to the isolation of the scattered island communities. From luxury travel to disaster relief, Tropic is unique in the South Florida aviation community (Britell, 2019).

Kenmore Air. Kenmore Air started, like many backcountry aviation ventures, in the wake of World War 2, when three friends returned to the state of Washington after their military service. Applying the flying and mechanical skills gained during the war, they established a small seaplane business operating a single DeHavilland Beaver to serve the small Kenmore Air Harbor. Initially, much of their business was on the maintenance and sales side of the industry, catering to the large community to backcountry private pilots in the Pacific Northwest. However, in the 1950s, Kenmore leveraged their success in selling Cessnas and Seabee airplanes to expand their charter offerings, connecting Washington and Vancouver for the growing business traveler and carrying hunters, fishermen, and outdoorsmen into the backcountry wilds (Kenmore, 2021).

Today, Kenmore boasts a large seaplane terminal in Lake Union, Washington. This facility allows Kenmore to operate more than 50 seaplanes, consisting of turbine and piston DeHavillands and Turbo Caravans. The operation uniquely connects the city of Seattle to the surrounding lakes, bays, and wilderness, while also serving as an essential link between it's nearby international neighbor, Vancouver. In this way, Kenmore is a singular combination of the bygone bush flyer and a modern commuter line. With its still robust maintenance department, Kenmore is a steward of the seaplane's place in modern air travel.

Alaska Airlines. Alaska Airlines is a major air carrier, with \$8.2 Billion in annual operating revenue (Wensveen, 2018). They operate hundreds of aircraft, and maintain transcontinental routes, as well as serving international destinations (CAPA, 2019). They started, however, much more modestly. In 1932, two small backcountry aviation operations, McGee and Star Air Services combined to form Alaska. Their fleet was an eclectic mix of float planes and cargo carriers, and much of their business came from training local pilots at the Star flight school. Charter flights landing on tiny lakes in the interior of Alaska were the fundament of the early airline's business.

Like its smaller Pacific Northwest cousin Kenmore, Alaska's growth came with the end of World War 2 and the acquisition of surplus military aircraft, in particular the DC-3. This, along with rulings by the Civilian Aeronautics Bureau (CAB, precursor to the modern FAA) allowing air routes from Alaska and Canada to Washington and Oregon (a ruling which also benefited Kenmore) led to the Airlines ascension to its present lofty position amongst such giants as Delta and America Airlines (Alaska Airlines, 2019). However, though it has moved away from its amphibious roots, Alaska would not be the corporate powerhouse they are today had it not found a way to turn the dangerous and unpredictable work of landing airplanes on lakes in the middle of the Alaskan wilderness into a predictably profitable enterprise.

International Seaplane Operators. Similarly to destinations in the Caribbean and Pacific Northwest, wherever there is a demand for expedient travel to an isolated, water-bound destination, there is likely to be found a seaplane operation servicing it. The Maldives, one of the most isolated archipelagoes in the world, is no different. Trans Maldivian Airlines maintains a fleet of 57 DeHavilland Twin-Otters, the twin engine turboprop big brother of the single engine classic operated by Kenmore. This airline started its life as a helicopter air taxi, seeing an

acquisition by a Danish race car driver who loved visiting the islands but hated the sea journey getting there, in 1993. 2014 was a banner year for the company, seeing it crowned the leading seaplane airline in the Indian Ocean and the largest seaplane operation in the world (edging out Kenmore by 5 aircraft) (Trans Maldivian, 2021).

A venture in Greece hopes to emulate Trans Maldivian's success with a venture proposed to begin in the summer of 2022. Leveraging a Greek government investment in the modernization of the port of Alimos, Hellenic Seaplanes plans to establish a route which would see passengers arriving at Athens International Airport and immediately departing on a Hellenic flight that would splash down 90 minutes later at the docks of the resort town. If this is successful, Hellenic intends to follow the model of Trans Maldivian and present a seaplane version of the airline hub-and-spoke model, with Alimos serving as the point of origin to the many desirable destinations throughout the Greek isles and wider Mediterranean (Hellenic Seaplanes, 2020).

Chalks International: How Legacy Seaplane Operations Fail. Before Tropic Ocean Airways, Chalk's Ocean Airways was a Miami icon. Founded after World War 1 by the legendary Arthur Burns Chalk, Chalk's established a scheduled route to Bimini in 1919, making it, until it's collapse in 2005, the country's oldest continuously operating airline. Chalk built up a fleet of Grumman Mallards, big flying-hull designs that became emblematic of nearly every era of Miami's growth. During the depression, bootleggers and gangsters like Al Capone (a Star Island resident when not in his home city of Chicago) frequently took Chalk's flights to visit the bases of their rum running operations or check on their illicit offshore accounts. In the 1930's movie stars, industrialists like Howard Hughes, and outdoorsmen like Ernest Hemingway flew Chalk's to take advantage of the world-class fishing and resorts in Bimini. The Chalk's fleet was

drafted into military duty during World War 2, flying anti-submarine patrols throughout the Caribbean. Through the '60's and '70's, the airline saw the departure of their revered "Pappy" Chalk and a secession of owners, as well as the addition of several large Grumman Albatross aircraft. In the Miami boom years of the 1980's Chalk's was not large or exceedingly lucrative as a business venture, but was an indelible part of the South Florida landscape. Chalk's Grummans featured in several episodes of the wildly popular television show Miami Vice. Despite turbulent changes in the company's financial status, including short periods of ownership by Donald Trump and Merv Griffin, Chalk's appeared to be hanging on, through the 1990's and into the early 2000's (Scammel, 2003).

But Chalk's airplanes were old. The 14 Grumman Mallards comprising the Chalk's fleet in 2005 were all built in the 1940's and '50's. And all of Chalk's flights took off and landed in salt water, which is dangerously corrosive to aircraft aluminum over time (FAA, 2013). Chalk's had maintained a surprisingly pristine safety record for a business with so many thousands of flights. Prior to 2005, the airline had seen only one fatal accident, when a pilot's failure to conduct a preflight check led to a takeoff with incorrect ballast, resulting in a hard landing that led to a death. Otherwise, Chalk's had maintained a reputation as a prestigious and safe company to work for and fly on. However, over the years, complacency had crept in. The aging Mallards were showing their age, with cracks forming in wing struts and airframe. The maintenance department, rather than take more drastic and expensive action, responded by stop-drilling the cracks or sandwiching them with aluminum supports, which served the additional role of hiding the growing cracks from prying eyes. Although the aircraft passed yearly and 100-hour inspections, they were undoubtedly un-airworthy (Midair Disaster, July 2, 2021).

On December 19, 2005, Chalk's flight 101, a Turbo Mallard flight with 20 souls aboard, took off from the waters of Government Cut in Miami. Shortly after liftoff, at an altitude of around 500 feet, cracks in the wing strut caused by saltwater corrosion and extended use caused the wing to tear free from the airplane. All aboard were killed when the fuselage smashed into the water and sank. The ensuing National Transportation Safety Board (NTSB) investigation uncovered a systematic failure of Chalk's to appropriately address the maintenance issues it's vintage fleet faced. The NTSB determined that the corrosion issue was foreseeable and preventable. Based on these conclusions, the FAA revoked Chalk's operating license, immediately precipitating the airline's demise (Stieghorst, 2007).

Challenges Facing Seaplane Operators. Chalk's illustrates many of the most important challenges facing operators of seaplane airlines. Demand for travel to secluded island destinations may rise and fall, but a seaplane company, unlike a traditional airline, has fewer option to pivot to other destinations or other sectors of aviation such as cargo. If people don't want to be taken to the places that seaplanes serve, the operator won't be able to compete with traditional aircraft in terms of efficiency and cost savings when flying to inland destinations. Chalk's managed to avoid this pitfall and persist through many national economic ups and downs by choosing a destination with durable appeal and a built in traveler base. While the inherent volatility of the air travel sector did impact Chalk's at times, including precarious periods of ownership by entrepreneurs of dubious aviation expertise, the inherent uniqueness and proven track record of the service allowed it to survive. It was at the same time a novel, romantic experience for tourists and a practical, no-nonsense way of getting there to people with business in the islands. But the ultimate downfall of Chalk's, and a challenge that all seaplane operators have to place front-and-center, is the expense inherent in operating an airplane in any body of

water, salty or fresh. Land-based aircraft simply don't have to incur the same costs. A operator may have to make the tough decision that the saltwater spray from a decade of flight to a destination Eleuthera has simply cut the lifespan of their million-dollar aircraft short, and take the loss. If they decide, instead, to persist and continue flying a potentially compromised aircraft, a singular deadly event could end their company in an instant (A.W., 2009).

Conclusion. There is something special about a seaplane. While the National Airspace System, with its redundancies and safety measures, is a miracle of modern technology and planning, there is something restraining about it, something that the pioneers of early aviation would not recognize. Splashing a big, loud DeHavilland Beaver onto a lake in the wilds of Montana, and discharging passengers and cargo onto the dock: this has some of the soul of early flying. That it still represents a viable money-making business option is a testament to the efficiency of the systems of logistics, maintenance, and airmanship developed by the back-country pioneers, the captains of the PanAm Clippers, and the thousands of pilots who had the bravery to challenge both the clouds and the waves.

The Clipper routes helped pave the way for the global network of airline travel the world relies on today. Pappy Chalk's Mallards helped build South Florida and hold an eternal place in aviation history. Today, charter seaplane operations connect isolated communities, and open parts of the world that outsiders may otherwise never see. Seaplanes hold an enduring place in the civil aviation industry, and if operators take the lessons of their fore-bearers, will remain an important, if ever exotic, part of how we use airplanes to connect our world.

References

- Alaska Airlines (2019). *Historical Overview*. Retrieved from <https://www.alaskaair.com/content/about-us/historyAlaskaAirlines>. Accessed on 8 December 2021.
- Aviation Triad (March 26, 2018). *Through the Skies and Across the Ocean: How Seaplanes Have Changed Aviation*. Aviation Triad Online. Retrieved from <https://www.aviationtriad.com/through-the-skies-and-across-the-ocean-how-seaplanes-have-changed-aviation/>. Accessed on 7 December 2021.
- A.W. (2009). *Why Seaplanes are so Dangerous*. The Economist. Retrieved from <https://www.economist.com/gulliver/2019/05/28/why-seaplanes-are-so-dangerous>. Accessed on 8 December 2021.
- CAPA (2019). Alaska Airlines. Retrieved from <https://centerforaviation.com/data/profiles/airlines/Alaska-airlines-as>. Accessed on 8 December 2021.
- Daley, B. (November 14, 2014). *Longing for the Golden Age of Air Travel? Be Careful what you Wish For*. The Conversation Online. Retrieved from <https://theconversation.com/longing-for-the-golden-age-of-air-travel-be-careful-what-you-wish-for-34177>. Accessed on 7 December 2021.
- Federal Aviation Administration (September 11, 2018). *Advisory Circular 443-4B*. Retrieved from https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_43-4B.pdf. Accessed on 8 December 2021.
- FlyTropic.com (2021). *About Us*. Tropic Ocean Airways. Retrieved from <https://flytropic.com/our-company/>. Accessed on 8 December 2021.

AVS 481 Final Paper: Modern Seaplane Air Carrier Operations

Hellenic Seaplanes (2020). *Our Services*. Retrieved from <https://hellenic-seaplanes.com/en/services/>. Accessed on 8 December 2021.

Kenmore Air (2021). *History*. Kenmore Air. Retrieved from <https://www.kenmoreair.com/about-us/history/>. Accessed on 8 December 2021.

Mayday Air Disaster (July 2, 2021). *Cracks in the System / Ocean Crashes / FULL EPISODE Mayday Air Disasters*. YouTube.com. Retrieved from <https://youtu.be/-RRIXOT3Gps>. Accessed on 7 December 2021.

Rearden, J. (October 1, 2009). *Alaska's First Bush Pilots, 1923-1930*. Pictorial Histories Publishing Co., New York, NY.

Scammel, H. (2003). *Chalk's Ocean Airways*. Air & Space Magazine. Retrieved from <https://www.airspacemag.com/history-of-flight/chalks-ocean-airways-3431981/?page=3>. Accessed on 8 December 2021.

Stieghorst, T. (October 19, 2007). *Chalk's Airlines Loses Flight License*. The Sun Sentinel. Retrieved from <https://www.sun-sentinel.com/news/fl-xpm-2007-10-19-0710180726-story.html>. Accessed on 8 December 2021.

Taylor, J. & Munson, K (1976). *The History of Aviation*. Crown Publishers. New York, NY.

Trans Maldivian Airlines (2021). *About Us*. Retrieved from <https://www.transmaldivian.com/about/>. Accessed on 8 December 2021.

U.S. Coast Guard (2020). *Navigation Rules*. U.S. Department of Homeland Security. Retrieved from <https://www.navcen.uscg.gov/?pageName=NavRulesAmalgamated>. Accessed on 8 December 2021.

National Archives and Records Administration (2021). *Code of Federal Regulations*. U.S. Federal Government. Retrieved from <https://www.ecfr.gov>. Accessed on 8 December 2021.

AVS 481 Final Paper: Modern Seaplane Air Carrier Operations

Webber, T. & Dodson, J. (2018). *Hunting the Wind: The Pan American Airways' Epic Flying Boat Era, 1929-1946*. Schiffer Publishing, New York, NY.

Wensveen, J. (2018). *Air Transportation: A Management Perspective*. S.I.: CRC Press.