

Float Incorporated Response to Airport Authority Letter Dated 8-21-03

This is Float Inc.'s response to a letter from the Airport Authority dated August 21, 2003. That letter was a response to the resubmission of the material requested by the JAAC on October 22, 2002. These materials were hand delivered to the ATAP on November 12, 2002, but apparently misplaced and not considered in the preparation of the Tier 1 report. The Airport Authority's August 21 response is in italics.

The San Diego County Regional Airport Authority (Authority) has completed a review of the data provided for the Off-Shore Floating Airport. We greatly appreciate Float Incorporated's interest in finding creative solutions to the problems associated with siting a new international airport in San Diego County. However, we have identified several fatal flaws in the floating airport concept as a replacement airport at San Diego. The following problems with the floating airport concept and the information provided by Float Incorporated are central to our recommendation:

The matrix of site options clearly points to the offshore floating option as the best option in most categories and at least competitive in the rest. As will be seen below, there are no technical or inherent prohibitions to building a floating airport. We strongly caution against the characterization of these issues as "fatal flaws". The term "fatal flaws" implies an incontrovertible malady. The Airport Authority response states that FloatPort has several. None of the issues brought up in this response, taken singly or in aggregate, could lead one to make this statement.

- *As acknowledged by representatives of Float Incorporated, the proposed Pneumatic Stabilized Platform (PSP) concept has not been commercially tested or implemented as any form of an airport or on a scale necessary to host the type of airport facilities envisioned for San Diego's long-term commercial aviation demand.*

It is clear that the Airport Authority is targeting one of the military bases as the favored site for the new airport. This course presents two major problems. First, it would require the BRAC process to make one available. Considering the opposition of the military, most of the congressmen in the area, and the business that would suffer from the loss of the military payroll, this is a formidable risk. Second, presuming those barriers are overcome, it will face intense and **concerted** opposition from the communities surrounding the selected site.

The risk involved in building the first floating airport is more manageable. It is primarily an engineering risk and today engineering has demonstrated the ability to solve very complex problems. For example, the design and production of a new airplane is accomplished without having to build a prototype (the Boeing 777). The designers and engineers who have and are participating in the PSP development have impressive credentials. Furthermore, before it is time to build FloatPort, it is likely that a full scale (although smaller) PSP will be afloat. Increasing the size of the platform becomes increasingly advantageous. Another floating airport application or comparable will not be needed to demonstrate its performance.

Does the fact that it has never been done before mean it can't be done? No. Does it mean it will

not work? No. The important point to understand is, never been done before is a very different issue than those faced by all the other airport site options. It is an issue that can be resolved.

“Never been done before” was also addressed by Float’s representative during the public comment period at the August 26 meeting. A copy is attached.

- *The strategic 2030 and beyond airfield facility requirements for a supplemental/replacement airport for San Diego International Airport (SDIA) are predicated on the need for two parallel runways - 12,000 feet long by 200 feet wide. These runways should be separated by 4,300 to 5,000 feet to allow for simultaneous independent arrivals and departures in all weather conditions. These runways should also be supported by full-length parallel taxiways and high-speed exits designed to meet FAA's Airplane Design Group (ADG) VI airfield design criteria. The airfield requirements for a minimum of 4,300 feet, and optimally 5,000 feet, of separation between the runways is the underpinning of the optimal airport layout applied uniformly to each of the site alternatives considered in the Tier I Analysis.*

We do not understand why this point is raised. This is a design issue. The FloatPort concept, as submitted, incorporates two 12,000-ft. runways with a 5280-foot separation. That exceeds the noted specifications. (note FloatPort plan view with scale, attached)

In addition, a floating airport site permits a layout configuration that would not be possible on most land-based sites. The configuration Float submitted utilizes an offset arrangement of parallel runways; one for landing and one for takeoff for the vast majority of operations. Landing aircraft will not be delayed for those taking off. Not only are the airplanes separated by more than FAA minimum requirements, they are also separated for further safety by altitude during these operations. With the terminal facilities in the center, taxi fuel consumption will be reduced as much as 40%.

- *Float Incorporated's assertion that a single 12,000 feet runway with associated runway safety areas and parallel taxiway can be accommodated on 220 acres and that a total requirement of 540 acres to accommodate the two runways and landside functions should be the criteria for evaluating the off-shore alternative cannot be accommodated. A single ADG VI runway with the associated dual parallel taxiway requires approximately 650 acres without consideration for terminal, cargo and other ancillary airport land uses. It would be difficult to justify the replacement of SDIA's 614 acres for a smaller site as a basis of comparison with the 15 other sites.*

Float Inc.’s assertion was that TWO 12,000-ft. runways with the associated safety areas, terminal facilities, etc. could be accommodated in less than 1,000 acres. (Note Power Point slide attached.) The submitted concept can easily accommodate ADG VI specifications.

The Airport Authority has mandated that an airport on land will require a **site** of 2,796 acres. The **site** for FloatPort is virtually unlimited. It is the Pacific Ocean. In the layout suggested by Float Incorporated, the **footprint** of the two-level platform needed for air and terminal operations is less than 1,000 acres. It is anticipated that the lower level will be used principally for parking, vehicle circulation and the balance of airport related space requirements. All other functions such

as the deep water port, transportation center, cruise ship terminal etc. are not included in this footprint as they represent concession revenues that can not be duplicated on land and may be under different ownership or jurisdiction.

But once again, this is an airport design issue. The runways will be designed and built to whatever FAA requirements are at the time.

- *The installation of an Instrument Landing System (ILS) for simultaneous operations of two precision instrument runways during instrument weather conditions requires the installation of a glide slope (land-based navigational equipment that provides vertical descent guidance to approaching aircrafts), a localizer (land-based navigational equipment that provides azimuth guidance to approaching aircrafts) and an inner marker (land-based navigational equipment that provides range guidance to approaching aircrafts). This equipment has extremely stringent tolerances for horizontal and vertical movement. The proposed PSP technology has not demonstrated the ability accommodate the siting and calibration requirements of these navigational aids.*

We quote from a letter from an ILS manufacturer dated 8-25-03: “The Glideslope portion of an ILS system relies on the ground plane in front of the 60ft antenna mast to form the correct 3 degree glide slope signal in space by bouncing the signals off the terrain (image antenna type system). On a floating platform it is anticipated the terrain will be level, and as long as the tower is moving in the same relationship as the platform, there is no relative difference between the antennas and the beam-forming terrain. The glideslope beam-forming terrain area is up to 2000 ft in front of the GS antenna (which is located at 954 ft back from the threshold), so the level area needed in front of the threshold (from the aircraft approach end) would be 1050 ft approximately. The localizer signal forming is essentially independent of the ground in front of the antennas.”

The equipment will be installed on the platform deck according to manufacturer and FAA standards.

- *There are no available pavement calculations to demonstrate the ability of the PSP to accommodate aircraft landing loads without significant deflection in ILS antenna calibration.*

There are no available pavement calculations for any site.

Each runway and the platform beneath it will weigh over 8 million tons. Deflection will be measured in millimeters. As is shown in the letter quoted above, the critical issue is that the landing surface and antennas are on the same relative plain. This, along with the fact that the antenna array must be forward of the touch down zone by 1,000’ or more in order to project the electronic beam at 3 degrees, makes the system function properly. Regardless of the minute, if any, platform movement, these two defining elements will always be moving together.

- *The aeronautical (terminal, air-cargo, general aviation, maintenance, inter-modal and support facility) requirements as well as value added non-aeronautical commercial/industrial activities (revenue parking, foreign trade zones, concession retail,*

light-manufacturing, truck terminals, hotels, service stations) necessary to make a 30-50 MAP airport operationally feasible drive the need for 2,800 to 3,000 acre footprint. These facilities are integral to the financial feasibility of the airport and require cost-effective adjacent airport land.

The financial feasibility of the airport is an important issue. But it must be thought through carefully. It is not our place to question the acreage the Airport Authority feels it needs, even though we do not agree, but it is noteworthy that the footprint of Dulles International Airport, without its third runway, is less than 1200 acres. It is also interesting to note the similarity between the Dulles runway configuration and the configuration submitted for FloatPort. Additionally, FloatPort provides two acres of space for each acre of footprint.

It is highly important to include **ALL** the costs of the land-based real estate when counting it. Airports affect a much wider area than the acreage they and their support facilities occupy. The costs of these effects **MUST** be weighed in the balance when comparing floating and land-based airport real estate costs.

One unmentioned feature significant to the financial health of the airport is the hours of operation. FloatPort is a 24-hour airport.

- *Float Incorporated's concept asserts that the offshore floating airport can accommodate parking and air cargo functions under runways and taxiways. This concept is unfeasible under current Federal Aviation Regulations for minimum standoff distances between sterile Airport Operating Areas and publicly accessible areas.*

We have researched the use of the under deck area with relation to the operating flight deck above, and have recently verified the FAA's opinion on this issue. The FAA could not refer us to minimum distances between public access areas and the sterile operating zones. Further, many conditions exist where private and commercial vehicular traffic pass beneath concrete taxi ways, as at LAX, Dallas-Ft. Worth and O'Hare. The FAA engineering officer only pointed out the obvious that the landing deck must be structurally supported to carry the load of approximately 1,000,000 lbs. As in all designs, they must be submitted to the FAA for approval.

- *Future expansion potential in the context of additional airfield capacity would likely be limited given the challenge of constructing the platform with cranes (as shown in Float Incorporated's exhibits) while maintaining operations. Obstructing operational airspace in the course of incremental expansion would be a limiting factor.*

This mistaken assertion stems from the misinterpretation of a sketch showing a crane installing the second level on a platform. In fact, there are a number of ways expansion can be accomplished without any interruption to airport operations.

- *Float Incorporated proposes a submerged floating set of tunnels (tethered to the ocean floor) as the primary access. This concept has been rejected as a feasible technology for a similar application (Lake Washington, Seattle, WA estimated \$3 billion for a two mile length through shallow and calmer water) and cannot be considered in lieu of conventional causeway*

technology given FloatPort's very low \$540 M estimate for a 4.5 mile tunnel plus a 0.75 mile transitional tunnel which appears to have remained the same since the report was published in 1995. A causeway would be no more financially unfeasible or environmentally unacceptable than a submerged "floating" tunnel. The feasibility and cost estimate of the tunnel access was suspect and questions regarding the cost estimate were raised in earlier correspondence, however, the same unmodified data was provided in response. A causeway extending Interstate 8 was deemed the most appropriate approach.

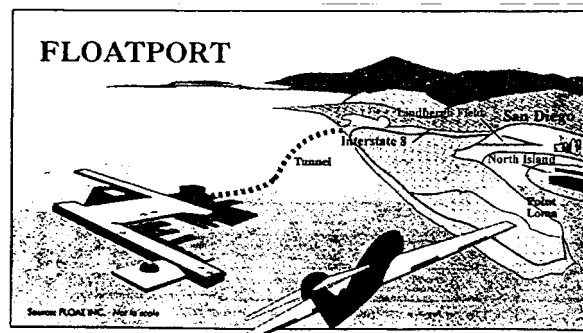
The 3 billion dollar estimate cited here for Seattle is actually a 2.5 to 3 billion estimate for a "submerged sunken" tunnel. The estimate for the floating version is 1.5 to 2.5 billion dollars. Thus the floating tunnel is estimated to cost approximately 70% as much as a sunken tunnel. Conventional causeway technology was not considered, as the lake is too deep. In the absence of water traffic, tides and waves, a floating (on concrete pontoons) bridge would likely be the most cost effective solution. This is bolstered by the fact that two floating bridges presently carry traffic across the lake. Weather, traffic and waves dictate that the tunnel floats submerged, out of those influences.

Who deemed the causeway to be the most appropriate approach? A causeway was specifically rejected by Float because the ocean depth at the proposed location of FloatPort is 320 feet. Whether constructed on fill or pilings, it would be prohibitively expensive, a navigation hazard and an environmental nightmare.

Float's estimate was carefully worked out last November, and the detail provided, using inflation-adjusted numbers. By way of comparison, the cost of the recently completed, sunken tunnel between Denmark and Oresund, Sweden was 483.5 million for 3.5 kilometers. It is not valid to assume a linear cost per mile comparison, longer tunnels should cost less per mile, but even ignoring that, using the 30% reduction for floating, and considering that the Oresund tunnel has two land transitions, the 540M estimate is reasonable.

- *Floatport's assertion that the location off of Mission Bay evaluated in Tier 1 is different than the location off of the southern tip of Point Loma is inconsistent with its own Figure 1, in the paper entitled FLOATPORT: "A floating solution to the San Diego Airport's Environmental Problems" MTS Journal, Vol.29, No.1) depicting the conceptual facility located south west of Mission Bay. Locating the facility off of the southern tip of Point Loma would require all airport-bound traffic to traverse through the peninsula beneath Cabrillo National Monument to a tunnel entrance located in one of the best known wildlife preserves in the State.*

The Figure 1 referred to:



Nowhere in the text or graphics of any of the materials submitted with this proposal, nor on Float, Inc.'s web site is the airport depicted or described as floating off Mission Bay or being accessed from Point Loma. The Figure 1 referred to is a perspective cartoon drawing by an artist working for the magazine and is labeled "Not to Scale". Further, the text, immediately above the figure describes the location as "three miles West of the Southern tip of Point Loma". Obviously the tunnel never approaches within three miles of the Cabrillo National Monument.

- *Float Incorporated's cost estimates are dated from a document published in 1995 with no escalation or new estimate provided. Assuming even a nominal 4% APR escalation to FloatPort's "actual amount of floating real estate that would need to be constructed," the cost of the platforms without improvements, along with a 4.5 mile submerged floating tunnel, would be substantially higher than the costs presented. The dated cost estimates as submitted appear to be construction costs only without consideration of design, construction management and contingencies. These associated cost components in the conceptual phase can increase project costs by 35 to 50 percent.*

The 1995 document referred to is the article in the MTS Journal. There is no discussion of cost in that article. The submitted costs were derived from a Conference Paper on Floating Concrete Structures by T. Y. Lin, presented at a NOSC Conference in 1988 **and are adjusted for inflation** (footnote 3 in the Nov. 12, 2002 response). We did provide a construction cost estimate that did not include design, etc. fees. However, these fees are normally less than 20%, not 35% to 50%.

Once again, we must note that costs are not an issue at this stage. There has been no discussion of the costs of any of the proposed sites nor is this an element in the matrix. We have provided cost estimates that are exactly that. Accurate costing must await completion of the basic design and requisite studies. There is, therefore, no more basis for the Authority to assert that the submissions are incorrect than for us to assert that they are correct. What was submitted are best estimates based on a standard approach to the construction of concrete structures.

- *As noted in the Tier I report, we stand by the estimate of 23% of users having less than 30 min travel time. While it is true that travel time from the junction of Interstates 8 and 5 would be on the order of 5 minutes (to the location off of Mission Bay) - the percentages are measured from the County employment and population centers, not the junction referenced in your letter.*

We do not dispute the percentages as stated in the matrix. However, we do not understand why the "general population" was used rather than the geographical distribution of airport users. Our point is that Lindbergh is much beloved for its convenient location, and FloatPort will preserve that attribute.

- *"Excess Future Roadway Capacity" or "2020 Capacity Deficit" numbers are provided for an equivalent comparison of the sites even though there is currently no access. The criteria was surface access on planned infrastructure hence water and other means of access such as*

maglev, high-speed rail, and other access alternatives were not uniquely applied to each site. A high-speed hydrofoil ferry service has not been successfully implemented and a test between North County and the central business district fared poorly as transit passengers are interested in seamless final destinations, not waypoints to more connections.

The access to FloatPort should be considered as part of the airport. The "Excess Future Roadway Capacity" should be calculated for the existing roadways that lead to the mouth of the tunnel.

It is not valid to cite the previous failures of high-speed hydrofoil ferry service. If North or South County residents living near the coast had the option of parking locally and taking a high-speed ferry to the airport instead of facing traffic congestion, there would be a much different market dynamic working.

- *My statement that a \$15 billion cost may as well be \$100 billion was indeed misquoted, however, the context in which it was represented remains accurate. The concept has been rejected in lieu of less costly and market-tested construction methods because at the end of the process, the development alternative must be financially feasible from a market perspective in order to secure financing.*

We certainly agree that the development must be financially feasible from a market perspective in order to secure financing. But the use of \$15 billion to \$100 billion is so egregiously in error as to constitute severe distortion and ridicule. There is no basis for it in any of the cost estimates submitted.

The Tier I report did not address cost, and appropriately so at this stage. When comparative costs are considered, they should include, in addition to all direct costs, the cost of litigation and reparations, and indirect costs such as lost revenue from present land use and the loss of income from the displaced military. The floating option will fare well when compared with the true cost of the land-based alternative.

- *There are significant regulatory hurdles to implementation of the Float Incorporated concept that have not been addressed. Because the proposed airport would be located in an area under the jurisdiction of the State Lands Commission, a State Lands lease or permit would be required. Also required would be a coastal development permit issued by the California Coastal Commission, a Section 404 of the Clean Water Act permit issued by the Army Corps of Engineers, and possible formal consultations with the U.S. Fish and Wildlife Service for endangered species concerns. These would follow a detailed and lengthy review of the environmental consequences of the Float Incorporated concept under both CEQA and NEPA. Although no formal investigations have been conducted, we can anticipate that there will be significant environmental impacts as a result of construction of a floating airport that may preclude approval by the various regulatory agencies.*

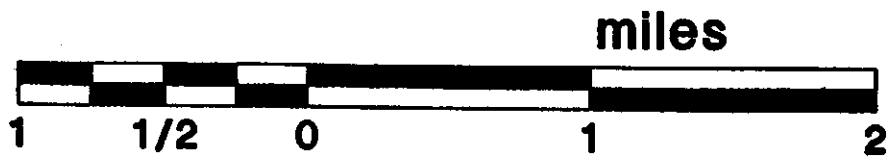
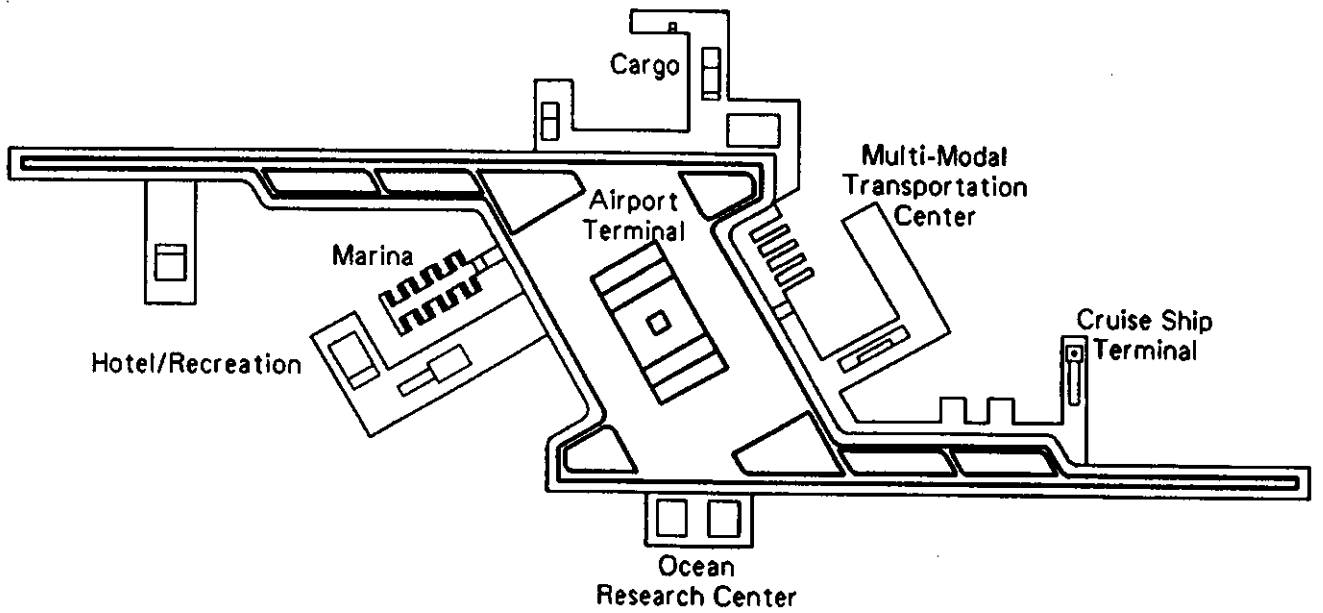
Regulatory hurdles will exist for any site. Given the well known negative environmental impact of any land-based airport, obtaining the permits for a floating airport will be significantly easier. We have explicitly discussed the floating airport with environmental groups such as the Sierra Club and asked for their concerns. Thus far, no significant issues have been identified.

- *We are confronted with a deadline to find an alternative that "best" serves the long term air transportation needs of this region. In our professional opinion, a floating airport does not meet our requirements. Even if the Public Working Group recommends that this concept be carried forward, it is doubtful that the resources or funding can be disproportionately spent to verify its foundational technology.*

San Diego has been looking for a new airport location for more than 40 years. Since one has not been found yet, it is evident that one has to find one outside the box. This requires imagination and willingness to support something that has never been done before. FloatPort is such a solution. The evaluation matrix clearly shows in all but two or three categories that FloatPort is superior to all other sites. In those remaining, the ranking is arguable since the rationales on which they are based are either skewed or not applicable to a floating facility.

It is very easy and nonproductive to scoff at a unique concept and belittle it. It is also easy and more productive to help make a worthy concept work. The FloatPort concept deserves serious consideration, at the very least. It will deliver more revenue, more tourism, more business to this city than is possible with just another land development. It is dramatically less environmentally disruptive and negatively affects the least number of residents. It will also be the safest airport in the nation.

The Airport Authority's response has been released to the public. We respectfully request that this response be similarly released.



Regional Airport/Harbor Proposed For The City of San Diego

Comments to Working Group 8-26-03 on Offshore Floating Airport

Good afternoon ladies and gentlemen. At last the offshore floating airport is where it needs to be, in a matrix comparing it with the other options. As we expected, FloatPort looks positively spectacular in comparison. It would look even better if the analysis had everything right. But, alas, it has the wrong configuration, located in the wrong place, accessed by the wrong means, its future expansion limited when it is not, and, according to the press, costing way more than it will.

When we discovered these inaccuracies, we sent corrections to the Airport Authority right away. Last Friday, we received a comprehensive 14 point response. We will respond to those points, and I won't try to cover them here, except to say that some are legitimate concerns, and most are just plain wrong. But there are good answers for all the points and none are fatal flaws. The working group will need to make sure that it has our response and the correct facts before making any decisions about the offshore option.

Let me limit my thoughts to you today to the first point on the list which is also the one that we have heard many times: it has never been done before. Never been done before. It may sound like a rational argument, but is it? Almost everything we have and do today, at some time, had never been done before.

Does the fact that it has never been done before mean it can't be done? No. Does it mean it will not work? No. What is really being said is, if it has never been done before, it is too risky for a public entity to consider. Of course if Churchill had taken that position regarding the Mulberries, the Normandy invasion might have been compromised. The stakes were high. But, like FloatPort, the risk was manageable, and the Mulberries worked brilliantly. Even more spectacular was Teddy Roosevelt and the Panama Canal. Talk about high stakes! The world's best canal builders had failed in their attempt to do it. But Churchill and TR had vision, courage and leadership, and that is what is needed here and now.

The important point to understand is, never been done before is a very different problem than those faced by all the other airport site options. It is a problem that can be solved. For instance, one possible solution is to tell the private sector that if they will build FloatPort, the Airport Authority will buy it, or how about lease it? Believe me, there is plenty of money available if there is a customer.

Finally, let me leave you with this thought. We are looking for a new location for Lindbergh Field. Why is it called Lindbergh? Who was he? What did he do? How do you think he would feel about something that had never been done before?