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# One Size Fits All

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Whether it's configured to seat 490 passengers or more than 800, the new Airbus A380 has arrived and airlines that plan to operate it are making preparations to work it into their fleet mix.



Starting with the early stages of development in 1994 and through numerous delivery delays, the Airbus A380 “super jumbo” has made its worldwide promotional tour and route-proving runs, and its launch customer, Singapore Airlines, has recently taken the extra-large bird into flight (see related article on page 46).

Because of its enormous size — carrying between 490 and 550 passengers in a three-class configuration — the A380 has been in the spotlight more prominently than the introduction of any other new aircraft in history. And future models of the super jumbo jet are planned to serve more than 800 travelers in a single-class configuration.

The sheer size of this aircraft calls for changes across the entire aviation industry, and while some of these changes present challenges for many of the world’s airlines, they can be overcome, and those operating the new aircraft can do so successfully.

### Crew Optimization

How many professionals does it take to fly and serve up to 550 passengers for flight times of up to 16 hours? The A380 does not fly greater distances than the Airbus A340-600 or the Boeing 747-400 — approximately 7,500 to 8,000 nautical miles. Because of these range limitations, the current planned utilization for the A380 is on established routes where extra capacity is needed or on long-range “flagship” routes. Keeping in mind how carriers intend to utilize the aircraft, most current regulations related to crew flight/duty fit the requirements for carriers operating the A380 to fly with no major additional restrictions. Flight and cabin crews already fly on the same non-stop routes as the A380 is intended.

So what is the issue, and why is crew optimization a concern? There are no major issues for flight deck headcount. The true concern is with cabin crew, which stems from the increased seating capacity of the super jumbo. The new aircraft will likely replace the A340-600 (with maximum capacity of 380 seats with three classes of service or 419 seats with two classes) and the Boeing 747-400 (operating a maximum of 416 seats and three classes of service or 480 seats with a single class). At 550 seats, the A380 offers an increased capacity of 33 percent. Based on most federal regulations, minimum cabin crew requirements are based on one cabin attendant for every 50 passenger seats (occupied or not). The A340-600 and Boeing 747-400 utilize an average of 12 to 17 cabin attendants. Given the increased seat capacity and extra amenities planned by many carriers that will operate the A380, 22 to 27 cabin attendants will be required. This is



Los Angeles, California, Mayor Antonio Villaraigosa welcomes the A380 on its first visit to the U.S. West Coast following the aircraft’s landing at Los Angeles International Airport on March 19.

an average addition of eight cabin crew per flight.

While increased cabin attendants presents challenges, the primary issues for many of these start-up A380 carriers has been two-fold:

1. The technical limitations of current systems,
2. Limited frequencies due to the initial delivery stages of the A380’s implementation into the carriers.

Both these issues put a strain on achieving significant or true optimization.

### Technical Limitations

Current technical solutions cannot account for headcount increases per flight and/or additional aircraft types. When most carriers implemented their current optimization systems, they included the maximum amount of crewmembers the system could accommodate based on the airline’s specific operation. In most cases, this was based on the largest or longest-range aircraft, whichever required the most crew and most stringent restrictions. This created technical issues with the systems’ capability to produce solutions that incorporate all aircraft types and allow for true optimization. In many cases, solutions can identify an increase in underutilized cabin attendants without consistent schedules. This increase is in large part due to the increased hiring on the cabin side because of the increased crew demands of the super jumbo.

The solutions vary according to the carrier and its existing optimization tools.

One solution involves programming changes that take into account new requirements and can focus on improving the overall utilization of crews. Some carriers have looked for completely new optimization solutions that can be integrated with their other crewing modules. Yet others took advantage of this opportunity created by adding the A380 to entirely replace their crewing tools across the board. Either way, a large financial and manpower investment has taken place to prepare for the new aircraft.

### Limited Frequencies

It’s a simple equation — the smaller the fleet size plus less amount of frequency equals less optimization opportunity. Because Airbus is only capable of producing 12 to 15 aircraft a year in the initial stages — there are more than 150 orders to date, and the delivery schedule in many cases is staggered — airlines will not have all their fleet orders in at once to provide greater opportunity for optimization, meaning A380s will be scattered across the entire flight schedule, mixed in with the other heavy, long-range fleet. This problem is unfortunately unavoidable, causing most airlines to manage as best they can until they have added a number of the new aircraft.

There have been many other challenges on the crewing side, including training issues such as upgrading and backfilling while keeping the airline operationally sound through the process. And there is always the issue of safety.



In March, the A380 visited Hong Kong during its second technical route proving trip to demonstrate its ability to operate on a continuous schedule representative of standard commercial service.

4. ERO alignment with best practices;
5. The airline's ability to manage the emergency as well as ongoing operations.

A systemic analysis of the ERO includes the review of various elements such as structure, human support plans, training, live exercise review, available facilities and the technology available to support the airline while it is in crisis mode. The airline's ability to respond to the emergency and support ongoing operations during the first hour (golden hour) after the emergency has been declared is another key aspect. Typically, airlines that have well-executed starts during the golden hour can minimize the effect of the emergency on the total operation as well as reduce overall recovery time from the emergency. Plans can be developed to help bridge the gap between the current state and the ideal state of readiness for the ERO. Once these identified areas have been addressed, the ERO should again test its procedures and validate the results. It should become a continuous cycle for the airline.

EROs should adopt standardized practices that help cut costs and achieve balanced responses to emergencies quickly. Special attention should be given to codeshare relationships. Recent articles suggest the A380 will be perfect for capacity consolidation on high-density routes. Operators must also prepare for excess capacity, which can be handled on preferential routes through codeshare agreements. Airlines involved in codeshares must consider several factors:

- Which airline has the overall responsibility for the customer?
- Which brand is at stake?
- Whose values and professional response will count?

It is a daunting task when considering all of the elements of an ERO and the need for an airline to be at its best when it is affected by an emergency situation.

One thing will always remain clear in the case of an emergency; the final result will depend on how well the airline is prepared to handle these serious and potentially life-altering events.

## Enroute Separation

There have been concerns that the jet blast from the A380 engines could be dangerous to ground vehicles and airport terminal buildings. The A380 produces more wake turbulence during take off and landing than existing aircraft types, requiring increased approach and departure spacing. In 2005, the International Civil Aviation Organization recommended separation criteria for the A380 should be greater than the Boeing 747-400. A working group concluded that an aircraft trailing an A380 during approach needs to maintain a separation of six nautical miles, eight nautical miles and 10 nautical

No one can deny that travel by air is the safest mode of transportation. However, accidents and safety-related incidents can and will happen. The A380 will be delivered with many built-in safety features that are designed to protect the occupants of the aircraft in the event of an emergency. One feature is aircraft fire protection.

Airbus has taken the lead to assure the A380 has the best available fire protection. The new state-of-the-art material called Glare is now being used by Airbus as a fire protection feature on the upper fuselage external panels on the A380. The U.S. General Accounting Office reports that normal aircraft aluminum skin can withstand the penetration of a fire caused after an aircraft accident for up to one minute. Testing has determined that Glare can withstand the same fire for up to 15 minutes before penetration occurs, thus providing for more occupant fire protection. Studies have been conducted by government agencies regarding the need to review airport rescue and fire fighting equipment and the techniques capable of assisting passengers and crew of an A380 in trouble. Despite all of the latest safety features and techniques available, the nature of probability suggests the Airbus A380 will not be immune to accidents and other safety-related incidents that affect the health and well being of passengers.

The European Aviation and Safety Agency along with the U.S. Federal Aviation Administration certified the A380 for up to 853 passengers plus crew. All 853 passen-

gers plus crew were able to safely evacuate the aircraft in 78 seconds during certification, a sobering result when considering an emergency and the need to activate an airline's emergency response organization.

Statistics identify that an airline can expect up to 75 calls per passenger after the airline has notified the public that it has encountered an emergency event that may affect the safety of passengers on a specific flight. An airline's ERO may need to handle more than 65,000 enquiries regarding passengers potentially affected by an emergency situation in a multi-cultural environment. In the case of multiple emergencies, the airline must be able to effectively manage the situation while still being able to operate its scheduled service.

History has validated the notion of a solid link between properly managed responses to an emergency and the protection of assets and business reputation. The A380 requires operators to consider new and improved ERO capabilities using a variety of technological solutions and practices.

Solutions for any airline to handle such emergencies began with the analysis of the current state and capabilities of its ERO. The overall analysis should consider five key points:

1. The airline's commitment to provide the highest level of professional response;
2. The airline's ERO structure, ability and overall knowledge to minimize the impact and consequences of an emergency;
3. Effective executive controls that are in place and have been operationally tested prior to an emergency;



During this year's Airbus A380 World Tour 2007, the new super jumbo visited Taipei, China, after stops in Tokyo, Japan, and Sydney, Australia.

miles respectively for ICAO "heavy, medium and light" aircraft categories instead of the traditional spacing of four nautical miles, five nautical miles and six nautical miles.

Air traffic congestion is rising to an alarming level. The percentage of delayed flights is increasing every year, making air travel more frustrating and time consuming. Congestion and delays not only discourage air travel but also reduce productivity and damage the health of national and world economies. The critics of the A380 may argue that the increased separation distance will lead to reduced capacity of air traffic, which is already struggling due to capacity constraints and worsened by the air navigation system's inability to modernize and move toward a satellite-based navigation system.

### Diversions

Airlines are often challenged by diversions, and in the instance of the A380, some situations call for unique planning and action. For example, an A380 inbound to Memphis, Tennessee, is advised that there is another aircraft inbound with a possible gear problem. The troubled aircraft will be allowed to land on runway 18C Memphis, which happens to be the only piece of concrete the A380 can use. The A380 crew discusses the issue with the airline's dispatcher, and two options are suggested: the aircraft with the problem lands on runway 18C without incident or it lands on runway 18C and parks there for a

long time. That gives the A380 two choices: a routine termination at Memphis or a diversion to some other airport.

Not every airport can accept the A380. An aircraft of this size simply cannot land at any airport; the runway has to be approved for that aircraft type, and the entire airport surface has to be analyzed for clearances, obstacles, load-bearing, etc. There are several places the A380 will not be able to taxi without having a possible wing clip of another aircraft on the nearby runway, for example. The air carrier has to have the diversion airport in its operations specifications, which presumes that such things as ground handling and support equipment, parking spot or gate, tug, fueling, and catering have been arranged in advance.

Even if all that has been addressed, there is still the issue of what to do with 550 passengers who are dumped into an airport and a crew that is out of duty time for the day. An airline will not have a reserve crew at that alternate airport, so passengers are going to have to be put on other flights, if available, or hotel rooms will have to be arranged on short notice. And, if the aircraft diverts from Memphis, it could very well end up in Dallas, Texas, or St. Louis, Missouri, or perhaps as far away as Los Angeles, California. When a Boeing 737 flight diverts from Chicago, Illinois, to Milwaukee, Wisconsin, the airline can arrange for busses to take passengers and luggage back to Chicago. If an A380 has to

divert from Memphis to Dallas, a quick bus trip for 550 people is not likely.

The A380 is well equipped to land in very low visibility. It will handle such things as slippery runways as well as other transport category aircraft. But when the unusual happens and the only legal runway at the destination is suddenly unavailable, tactical decision making may result in large numbers of unhappy passengers. This will be a rare occurrence, of course, perhaps slightly less rare at airports that experience disruptive winter storms that cause 30- to 60-minute runway closures for snow removal, with little advance notice. In those scenarios, it will be crucial for the airline dispatcher to negotiate in advance with air traffic control facilities and airport operators to ensure that the one piece of concrete that the A380 is capable of using for landing is in a suitable condition when the aircraft arrives. **F**

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