

# CASE STUDY OPERATIONS

## A LOOK INSIDE A PLANE'S COOKPIT

The growth of civil aviation has meant boom-time for inflight catering. But it's a logistical nightmare to meet the hunger and quench the thirst of all those new folks taking to India's skies.

Controlled chaos seems to be normal in any flight kitchen. On a typical day at the Oberoi flight catering facility in Mumbai, for instance, at midnight, as the trucks are about to roll, the control room learns that an international flight has been delayed. So that delivery has to be postponed by three hours.

Meanwhile the news from Delhi is that winter fog could hold up all traffic into the capital's IGIA. That could mean reworking an entire set of breakfast schedules and after that, lunches could cascade. If the visibility's really bad, some of the scheduled breakfasts may even turn into lunch! This happens every winter. The kitchen is resigned to the prospect of a frantic scramble once there is some fix on rescheduled departures.

At the same time as the coordinators try to get a handle on expected departure times (ETDs), there's the normal inventory to be done. After that, around 4 am, somebody will get on the line to wholesalers, placing orders for veggies, rice, flour, meat, eggs, chicken and other staples.

In other parts of the sprawling 22,000 square metre facility,

lines of swaddled, gloved and hair-netted workers are beavering away at various tasks. One lot are pulling veggies out of bins and chopping them up. Another lot are thawing meat, chicken and eggs. Another gang is pulling items out of the dry and packaged store. In the bakery, new batches of dough are being rolled and sectioned, ready to be baked into fresh batches of rolls and quiches. There are lines manning the hot ranges, running off omelettes, aloo tikkis and vadas.

Some people are pulling clean aircraft trolleys, trays, cutlery, cling film, aluminium foil and napkins out of the equipment store and placing them at final assembly workstations. Others are manning the big blast chillers where the hot food fresh off the stove will be rapidly frozen to kill bacteria. The lab technicians are taking swabs and samples to check for threats like salmonella and e-coli.

The executive chef and his juniors oversee these procedures. There are several airlines being catered to, with different menus assembled on different lines. Each finished meal will be finally loaded into the trolleys, with the individual items looking exactly like the specimen pictures of the

menu set by the airline client. Onboard, cabin crew will reheat and assemble the trays to serve to passengers. By the time the breakfasts actually take-off, the kitchen will already be in the final stages of knocking off the day's lunches.

Duncan Davis, Senior Vice President, Emirates Airport Catering Services Dubai, once declared: "An inflight catering facility is like a Rubik's Cube; there are so many products and processes that all have to come together at the right time and in the right place."

It's an apt description. There are over 200 people working

every single shift at the Oberoi facility. All of them are stretched to the utmost to churn out 500 meals every hour and they deliver to the exact minute, day after day. If flight schedules change, they switch gears instantly. By the time a shift finishes, everyone's ready to drop.

### The production process

Inflight caterer's facilities consist of kitchens and warehouses, located as close to the airport as possible. Caterers seek a ratio of 1 square metre:1 meal/day ratio in terms of space. According to Zafar Siamwala, COO, Oberoi Flight Services, "It is 1:1 which

Inflight caterers in India			
Caterer	Locales	Size (Meals/day)	Estimated Turnover (Rs Bn)
Taj Sat	Mumbai, Delhi, Chennai, Kolkata, Amritsar, Bangalore, Goa	55,000	2.3
Oberoi Flight	Delhi, Mumbai, Chennai, Kolkata, Bangalore, Doha	40,000	1.6
Sky Gourmet	Mumbai, Delhi, Chennai, Kolkata, Bangalore, Hyderabad	30,000	1.3
Ambassador Sky Chef	Delhi, Mumbai,	20,000	0.8
LSG	Hyderabad, Bangalore	12,000	0.5

Estimated Revenue@115/meal  
Source: Company websites, industry estimates



## PUTTING MEALS ON INDIA'S TRAY TOPS

India's inflight catering market is a four way affair.

Currently India's inflight catering is dominated by four large players. Taj-Sat, which is a joint venture between the Taj Group of Hotels and Singapore Airport Terminal Services, is the largest, delivering over 50,000 meals everyday out of its facilities in Mumbai, Delhi, Chennai, Kolkata, Amritsar, Bangalore, and Goa. Taj is ramping up facilities in second-tier destinations and hopes to have a capacity of over 100,000 meals by early 2009.

The second largest is Oberoi Flight Catering Services, which delivers around 40,000 meals, from hubs in Delhi, Mumbai, Chennai, Kolkata, Bangalore and Doha. The other major players are Sky Gourmet and Ambassador Sky Chef, which deliver around 30,000 meals/day and 20,000 meals/day respectively. All have expansion plans in place.

The world's largest inflight catering group, LSG Sky Chefs, which is a Lufthansa subsidiary, has also entered the fray, establishing a 7,500 meal/day facility in the new Hyderabad airport as well as a 5,000 meal facility in Bangalore.

Between them, the inflight caterers service the entire gamut of foreign airlines flying out of India as well as the full service Indian airlines (see Chart). While the foreign airlines contracts are more lucrative (involving longer flights and more meals), there are far more domestic flights.

In addition, LCCs are exploring options of tying up with caterers to serve paid-for meals and snacks and beverages onboard. Fast-food chains like Café Coffee Day have also entered the LCC food and beverages market. According to leading LCC, IndiGo, approximately 65% of passengers buy F&B onboard and this can translate into 3-4% of the airlines' revenues.

The caterers also offer further services such as aircraft cleaning and laundry services for airline personnel. This is one reason for the presence of hotels in flight catering. Hotels can offer a one-stop hospitality experience for an airline. ■

provides optimum flow". This is enough to comfortably maintain a warehousing and food-processing unit at the same location. The Oberoi facility in Mumbai serves around 10,000 meals per day, and it could easily ramp up capacity.

Usually a catering facility

holds up to four days worth of raw materials in inventory. The food is brought in, inspected, washed in mineral water and refrigerated. The process of unfreezing, chopping, cutting and preparing generally starts with 24 hour lead-time.

About six hours before any

given flight, there's visibility on the exact number of meals required. The meals will be ready about five hours before ETD and popped in the freezer. The food is delivered about two hours before flight departure for an originating flight. If it's a return flight, the turnaround time is tighter – the caterer will clean the galley and deliver meals within 30-45 minutes post-landing.

Flight kitchens prepare and deliver hot and cold items as well as running their own bakeries and confectioneries. Given Indian sensitivities, vegetarian and non-vegetarian food is processed separately, using separate equipment.

The meals are prepared using industrial cooking equipment such as ELRO Sirius cooking ranges and Foster blast chillers and freezers. This is all "intelligent" equipment, with internal micro-chips that ensure minimal power usage and allow for the batch preparation of preset meals.

Flight meals are always delivered to the airline at below 5 centigrade. After packing in aluminium foil or plastic film, hot meals are "flash-frozen" after cooking to minimise the chance of bacterial infection. Special "blast-chiller" machines are used to freeze the food, which is held for around 3 hours under refrigeration to kill all bacteria.

Typically a double-deck blast chiller (costing about \$20,000) can handle around 4,000 meals/day. An oven range costs around \$22,000 and it can handle up to about 4000 hot meals/day. Flight caterers always have excess chiller and oven capacity since it's easier to install when designing the facility.

Alcoholic beverages (only available on international flights out of India) are sourced by the airline but may be held in bond at the caterer's warehouse. Some caterers source non-alcoholic beverages, others merely store, chill and deliver non-alcoholics that are sourced by airlines.

After all this, the food and beverages are loaded onto airline trolleys and delivered in refrigerated hi-loader trucks. A 3 tonne hi-loader costs around 3 times as much as a normal truck with the same capacity and it has 30% less fuel efficiency due to refrigeration. It is used to deliver 1300 meals/day on 5 trips.

Onboard, flight crew will use convection ovens to heat up whatever is required before serving. Airline trolleys and catering equipment are washed and disinfected at the inflight kitchen before being re-used. Meiko and Ken are among the more popular manufacturers of industrial dishwashing equipment.

### The hygiene and personnel challenge

Any inflight caterer must be certified for Hazard Analysis and Critical Control Point (HACCP) clearance. They must meet international HACCP standards of certification of food safety for them to qualify as safe to serve airline food. These standards are designed to prevent microbial and other hazards in food production across the entire food chain. HACCP includes steps designed to prevent problems before they occur and to correct deviations through a systematic way as soon as detected.

The international HACCP standards are voluntary but

## Who caters to whom?

### OBEROI FLIGHT SERVICES (Established 1979)

British Airways, KLM Royal Dutch Airlines, Lufthansa, Northwest Airlines, Thai International, Gulf Air, Qatar Airways, Aeroflot, Air India, Indian Airlines.

### AMBASSADOR SKY CHEF (Established 1942)

Indian Airlines, Air India, Lufthansa, Swiss, Saudi, Asiana, Austrian Airlines and Air Lanka.

### TAJ AIR CATERERS (Established 1955)

Air India, Indian Airlines, Air France, Air Mauritius, Jet Airways, Cathay Pacific, Sahara Airlines, Kuwait Airways, Singapore Airlines, Virgin Atlantic, Malaysian Airlines, and China Air.

### SKY GOURMET (Established 2002)

Jet, Kingfisher, Malaysian Airlines, Air France, Jetlite, Air India, Indian Airlines.

**NB:** Air India and Indian Airlines are merged but domestic flights are designated Indian Airlines and overseas, Air India. This list is not exhaustive.

adhered to by all airlines. All the Indian majors also have halal certification. There are many organisations that provide food certification. Most are international, like Lloyd's Register Quality Assurance (LRQA). However, there are some national ones too like the National Centre for HACCP Certification (NCHC), a Kerala Government organisation.

Personnel working in flight catering need to have basic and intermediate certification to meet the Royal Institute of Public Health (RIPH) standards on food safety. Workers in flight catering facilities change their footwear on entry and wear hair-nets and sterile gloves at all times. All in all, the facilities maintain the same sort of hygiene standards as the better hospitals. In this hospitality business at least, hospitality means hospital-ity

Oberoi tied up with an international consultant, International Food Safety Company (IFSC) headed by Colin Banks, to improve work flow and safe hygiene practices. The methods used included direct interaction, workshops, tests and hands-on approaches. COO

Siamwala says "IFSC's support in training our employees and assisting in HACCP procedures and systems infused a new work culture. IFSC has assisted the Oberoi Group over several years enabling each and every employee to understand the critical need for HACCP, and ensuring certification of employees by successfully conducting RIPPH exams for every employee."

Siamwala claims that Indian facilities (not just Oberoi's) often surpass those abroad in terms of hygiene. He notes, "When I visited a flight kitchen in New York, the staff was wearing t-shirts and sneakers. Here, our workers are covered from head to toe and an enormous emphasis is placed on cleanliness."

### The logistical challenge

According to Vivek Pradhan, Manager, catering services, Kingfisher Airlines, "Airline catering is 90% about logistics and 10% about the food."

Oberoi's Mumbai facility has to prepare and deliver 10,000 meals a day (about 500/hr). About 700 workers are organised into three shifts to provide the various breakfasts, lunches,

## THE CHANGING SKIES

Airlines and their suppliers are innovating to make the passenger experience more pleasant and more efficient

**A** 2003 paper from the Travel Catering Research Centre entitled "Innovation in Flight Catering. Who? What? And How?" (by Peter Jones and Melanie Thomas) that claims airlines, not inflight caterers, were the most innovative in flight catering during 1990-99 period.

Innovations in "On Board Services" initiated by airlines was the area of maximum innovation, exceeding all innovations in the combined areas of food, logistics, equipment and training. For airlines, obviously service is a key area of differentiation and the paper postulates that airlines are forced to innovate more just because they are B2C, while caterers are B2B.

Where caterers have innovated, the new ideas have fructified in food products (36%), non-food product (32%) and service (32%). Successful examples of recent innovations from flight caterers include oxygenated spring water, a trolley that produces boiling water, a new process for recycling passenger kits.

Food products went through the shortest process of concept development, business analysis, trials and customer feedback. Non-food products and services went through longer development stages. It appears that a culture of innovation was more important than a formal R&D dept or formal stage by stage development of an idea into an innovation.

Interestingly, the International Travel Catering Association tries to foster novelty by offering an annual Mercury Award for innovation, the catering industry's equivalent of the Oscar. Two food-related innovations received awards last year.

Quodpod is a new meal service solution which replaces the conventional hot meal tray and reheated casseroles with freshly steamed, healthier meals (two hot and cold pods). The hot courses are kept cool by a reservoir of ice before being steamed in an induction oven. The ice rapidly converts to steam which then travels through the specially designed casseroles to provide more appealing, steamed dishes. In addition the pod design allows for space saving: each pod is twice the height but only a third of the footprint of a standard ATLAS hot meal tray, meaning each trolley carries 50% more meals, saving space and weight in the galley.

In the food category, Monty's Bakehouse came up with a new type of airline snack. Their hot pastries are baked and served in an ovenable, recyclable cardboard sleeve. The sleeve is easy to peel open; no trays or cutlery are required. The company develops the recipes and then works with a number of manufacturers to make the pastries. These are then delivered frozen to caterers with 12 months shelf life. In 2007 the company flew over 2m pastries (mostly with Air Canada).

What novelty will you discover on your next flight? ■

snacks and dinners. Everything is coordinated out of a "control room" that maintains inventory, tracks flight schedules, truck movements, etc, on a real-time basis, as well as overseeing kitchen operations.

Deliveries from the warehouse to the airport have to be scheduled and one of the two absolute rules of inflight catering is that you cannot be the cause of a flight delay. The other rule is, of course, that you cannot



be the cause of an inflight food poisoning incident.

The Mumbai Oberoi services roughly 50 flights a day. There are five key periods of delivery: late night/early morning for most international flights, early morning breakfasts, late morning lunch, early afternoon snacks and evening dinners. The food is delivered by a fleet of eight hi-loader vehicles that can directly lift trolleys into aircraft. Food is considered "delivered" only after it's loaded and tallied by cabin crew.

The complexity of logistics extends to the carriers. It is not uncommon for the same airline to use many caterers – it all depends on where it flies and who has available facilities there. So contracts may be for specific flights and it is possible that the airline will use a different caterer on the return leg. Contracts can be long-term or subject to review every quarter.

In high-density airports, such as Mumbai, Bangalore and Delhi, the same airline may use several caterers depending on which one has free capacity at the given ETD or turnaround time (if it's a return flight).

To return to the caterer, not only do a large number of meals have to be prepared but the caterers don't offer the same meals day in and day out. Airline chefs set the menus, with an objective of ensuring no repeats on the same routes.

For example, says Pradhan of Kingfisher, "We have as many as 200 menus, which we keep rotating in different cycles in different routes. Ideally, we will not like you to get the same food in the same route twice in the same week." In business-class, airlines are even known to track frequent flyers to meet their preferences and ensure no repeats.

## MASS CUSTOMISATION

When you produce large numbers of different meals for different airlines and routes, mass customisation makes sense

**F**light catering was the first segment of the hospitality industry to adopt mass customisation (MC, mass production of customised products) methods involving practices such as agile manufacturing, lean production, just-in-time inventory, modularity, and flexible labour practices.

According to management experts, MC enables the high volume production of a wide variety of products by adopting certain procedures and techniques in relation to the supply chain, production design, and order fulfillment processes.

Flight kitchens need MC due to their high daily outputs and great variety between airlines, seat classes and products. Globally over 600 flight kitchens have to prepare 1 million meals/day and deal with constant menu rotation. And there is a process of assembly and delivery subsequent to production.

The specific MC operational mode that flight caterers use is called flexible resource call-off (one of five mass customisation modes). In this mode a customer order is fulfilled by engineering a customer specific

product, and produced through modified order fulfillment processes. There is an expectation of repeat orders. "Flexible resource" refers to the modifiability of manufacturing and delivery processes. "Call-off" refers to the expectation of repeat orders.

The evidence of MC in flight catering is as follows:

- All flight caterers rely heavily on forecasting to manage inventories and many use IT to implement material resource planning and create Just In Time (JIT) inventory systems. Most caterers use key performance indicators (KPI) to eliminate idle time.
- Agile manufacturing is inherent in a business where there are last minute changes in schedules and menus change regularly.
- Most adopt common ingredients to manage a wide variety of menus, thus introducing modularity. Modularity is also evident in the equipment such as trolleys, trays and galley equipment.
- Most caterers have a mix of contract labour (mainly used as loaders) and permanent staff. Some have experimented with worker flexibility with for example, drivers helping out with washing up.

However, most of these measures may have been implemented piece-meal rather than wholesale. Different flight caterers have different levels of MC adoption. A complete adoption of MC across the industry would enable unprecedented levels of unbundling in terms of menus that could be serviced at the last minute. ■

# CASE STUDY OPERATIONS



It is perhaps unavoidable that given the effect of pressurisation on taste-buds and the added focus on safety (which means multiple freeze-reheat cycles) that airline meals will be bland. Nevertheless, flight catering chefs try to get around this. Oberoi is investing in a \$1million "flight simulator kitchen". This is pressurised to replicate conditions in an aircraft flying at 10,000 metres. The human body dehydrates in those conditions and that interferes with the taste buds. So the chefs try to ensure that the meals they concoct work under those conditions.

Margins are another challenge for inflight caterers. In-flight catering is not as high-margin a business as the standard hotel food and beverages business. In terms of raw materials cost, hotel F&B margins are excellent with raw material costs usually much less than 50% of the menu-price. It's not uncommon for an on-ground catering business to generate a net margin of 35% and 25% is a rough industry average.

The raw material cost is also low as a percentage of the meal-cost for a flight caterer.

But capital investments are high. The facility must be climate-controlled, have chill-blasting machines and refrigeration facilities. For example a 20,000 sq m. facility will require at least 4000 tonnes of refrigeration facilities. At a rough per ton installation rate of Rs 15000/tonne, refrigeration facilities costs would run at least Rs 60 million. Special high delivery trucks are required to offload the meals.

The total cost of designing and constructing a facility with refrigeration and equipment costs with a 10000 meal/day capacity run into the range of Rs 500 million. The rule of thumb seems to be installation costs of between \$950-1050/meal if one examines state of the art facilities such as Mumbai Oberoi, Taj Chennai, Dubai Emirates and Frankfurt Lufthansa. Power costs can run up to around 5% of revenues.

## UNBLANDING

Airlines and caterers must be both inventive and respectful of basic rules of thumb to make their meals more appetising

**L**eading airlines have three approaches to catering. At the top end, oil-subsidised airlines like Gulf and Emirates are restaurants-in-the-sky with on-board chefs. At the bottom end, LCCs have cut out meals altogether. In the middle, most international airlines are cutting costs in economy and offering signature menus to business/ first-class.

Cultural preferences play a large role. For instance, Singapore Airlines serves Far Eastern cuisine. Air India offers Pongal and Onam fare. Air France prides itself on the wine cellar and nouvelle cuisine.

Many famous chefs have turned their hands to airline menus and discovered constraints. According to Rangaswamy Subramaniam, (chef-cum-manager of Broadway Hotel, Kolkata), who has worked with the Oberois (in hotels and flight kitchens), constant freezing/reheating means flavours are muted, curries need to be over-seasoned, tandoor items dry out.

Working within those constraints, in-flight caterers and airline catering departments try and work out menus to tickle the taste buds of jaded frequent flyers. In order to manage inventory efficiently, this often means rotating the same ingredients ingeniously.

Airline chefs work by the following rules of thumb: No rare meat. For food-safety reasons, meat must be "well-done". Pasta and rice absorbs sauce when it's reheated. So pasta dishes must be over-sauced. Ditto biryani and pilaf. Fish is temperamental. Drier freshwater fish doesn't take reheating. Oilier seafish survives better. Vegetables can be temperamental. Experienced chefs may oven-roast veggie combinations and put some in raw to cook during reheating onboard. Leafy bok choy and lettuce, etc, are a bad idea. Bread is a problem. Toasted items such as croutons turn into mush, so cut out certain soups. Rolls go stale if kept on chilled trays so clear instructions must be given to crew.

So on your next flight, do a chef check. ■

Flight caterers do have some other revenues such as fees for cabin cleaning, laundry, etc. However, these are not really very significant and these add-on services are unlikely to have major growth potential. Some flight caterers are examining other potential markets such as catering to the call centre industry. Others are looking at tie-ups with the LCC market, where they may be able to generate higher returns on fixed items such as packed

sandwiches, pastries, etc.

By global standards, India is still a very small market. LSG for example, serves over 3 million meals a day worldwide. But India is on an airport building and refurbishing spree. More flights means more meals and more revenues for the inflight catering industry. ■

**NEXT ISSUE:  
PROJECT MANAGEMENT**