

undercurrent

The Private, Exclusive Guide for Serious Divers

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Rocio del Mar, Sea of Cortés, Mexico

sturdy, functional boat in remote, fish-filled waters

IN THIS ISSUE:

Rocio del Mar, Baja California ...1

Scubapro Recall of Some
Aladin Square Computers 2

Wakatobi Resort, Indonesia ...5

What Arnold Schwarzenegger
Film Suits the Lionfish?7

Florida, Maui, Palau10

Camera Batteries and Airlines 11

New Life-Saving Gear for
Freedivers12

Anatomy of a Dive Death....13

Does Diving Affect Hearing? .14

Choosing a Safe Liveboard..17

Father-Son Lawsuit Against Dive
Boat that Ran Over Them...19

PADI's Wicked Ways.....20

Flotsam & Jetsam22

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Dear Fellow Diver:

We all know about the power of the San Andreas Fault. Several million years ago, its shearing forces created the Gulf of California, a.k.a. the Sea of Cortés. Like the Red Sea, a creation of the Africa's great Rift Valley, the Sea of Cortés is a geologic wonder, filled with endemic animals. Though around a million people live in Baja California, diving the waters of the northern Sea of Cortés feels remote from civilization. While diving around the Midriff Islands in August aboard the Rocio del Mar, I was awestruck by the beautiful desolation.

Rocio del Mar, Spanish for "sea mist," carries 20 divers and almost as many crewmembers. Her captain, the aptly named Rey ("king"), varies the itinerary as dictated by weather and diving conditions, and will change sites if divers express strong wishes. She plies the waters from the southern Socorro Islands in the Pacific to far north in the Sea of Cortés, depending on the season. The diving varies wildly, from pea-soup visibility, cold upwellings and currents, to warm, clear water, caused by the massive tides and river sediment in the northern Gulf (where the Colorado River deposited silt for millions of years), and currents mixing with the Pacific Ocean farther south. The northern Sea of Cortés trips depart from Puerto Penasco, about an hour drive from the Arizona border town of Lukeville, in the Sonoran Desert, a four-hour drive from Phoenix's airport.



Rocio del Mar



This is a dive trip for the prepared diver. The boat is sturdy and functional, not glamorous. The large galley and crew quarters are on the lower deck; on the next level, the smallish dive deck holds eight double cabins forward; the third deck includes a salon, covered relaxation area and two slightly larger cabins; and the top deck houses the compressors, sun deck and a table where the crew sets up barbecues. Two massive stabilizers swing out from the sides as she enters open water. Cabins are quite small and short on storage (netting or extra shelving and hooks would be helpful) but sport comfort-

able new memory-foam mattresses. Ensuite bathrooms are basic and also short on amenities (mine had no rack or storage in the shower). While the water is hot, there are never enough towels (each diver is provided one bath towel and one washcloth). I was glad I brought a stack of microfiber utility towels from Costco to augment the supply. Consider bringing a hair dryer and lots of shampoo, because neither is provided. The current is 110 volts, and an 800-watt dryer did not seem to tax the system.

Bring plenty of layering options for the water. Rocio del Mar usually offers four dives per day, and waters can be cold for all but a few months. It's not so much thermoclines as upwellings and mixing of warm and cold waters; you can rarely predict when you will hit a patch of water in the low 60s. While the water warms considerably into November, I was there in early August and wore a 7mm wetsuit with a full polyolefin suit underneath and a fleece hooded vest, often augmented by a 2mm hooded vest and mini-hood from Terrapin Wetsuits. My buddy wore a 5mm with a 3/5 hooded vest and polyolefin suit. Both of us wore gloves and socks under booties to keep chafing minimal. I was never too hot (air temperatures of 98 degrees suit me fine) but a few polar bears seemed okay in lighter suits. Being cold is miserable, and the crew will help you with your gear so the extra weights required don't drive you nuts. You will also need to add weight, not only because you're wearing more rubber than usual, but also because the water is very saline. And bring a focused LED light -- it will help on daytime dives for peering into the rocks, and for the night dives.

The all-Mexican crewmembers speak good English, and though their jobs focus on a certain tasks (food, diving, engineering, etc.), all pitch in as needed. Chef Pancho may be the only one whose job never varies, to the delight of guests. He and his staff never needed more than one reminder of dietary preferences (one diver ate no fish, another needed small portions, one was vegetarian, and another disliked cheese). I preferred the Mexican dishes, like chicken and beef tacos with flour and corn tortillas and a plethora of sides, but the more continental dishes, such

Scubapro Recalls Some Aladin Square Computers

Scubapro announced a recall of 204 Aladin Square dive computers, sold between March and June, because they pose a risk of decompression sickness to divers using them. (they say there have been no accidents or injuries). After receiving four reports that the computers leaked and stopped working, Scubapro discovered fiber contamination on some circuit boards used in a single production lot.

Aladin Square computers with serial numbers ending in 003 should go back to an authorized Scubapro dealer for a free replacement. The serial number is stamped in white on the back of the computer, and printed on labels affixed to the back and side of the packaging. For more information, go to www.scubapro.com/en-US/USA/consumer-alerts.aspx or call (877) 467-6675.

as pork chops en crouete or pumpkin soup, were also delicious. Every dinner begins with a hot soup and ends with dessert. One timing change that I appreciate is having dessert available after, not before, the night dive.

All the divers aboard my trip were Americans, but books on the boat, and the guest log, told me European divers, especially Germans, are frequent guests. I can see the appeal: One can combine a dive trip with a visit to the Grand Canyon and Las Vegas, both a few hours north of Phoenix. Divers are split into two groups, each with its own panga. Dive times are limited to 60 minutes, 50 for night dives. I often came back with 900 to 1500 psi, but I understood the logic of the restrictions, though the panga drivers seemed to have diver-oriented GPS. Between unpredictable currents and visibility, groups need to stay together for safety. Entries are by backroll from inflatable pangas, and exits are easy because the pangas have ladders long enough even for tall divers. I took off all my gear, handed it up, then climbed up the ladder. Seas can be rough, so abandon your vanity and plop your butt on the inflated edges, then swing your legs over while hanging on tight.

I mentioned a sense of awe, and now that the practicalities are out of the way, let's talk about that. Our first dive was at Piedra del Angel. As one of the largest islands in the Sea of Cortés, Angel de la Guarda is itself a geologic marvel -- 45 miles long, only 10 miles from Baja but separated by a mile-deep trench. The temperature averaged 72 degrees on a rocky bottom alive with invertebrate life and swimming with fish.

Gilberto, our divemaster, assessed the needs of the group while my buddy and I took in the bivalves littering the bottom, like garbage outside a clam shack, and the many skates, rays (including small electric ones), eels, octopuses, huge triggerfishes (including the endemic big boy, the finescale trigger, almost the size of a Titan), massive groupers, scorpionfish so cryptic I nearly rested hands on them, sea stars and magnificent angelfishes, like the yellow-tailed King and the yellow-striped Cortés. My logbook notes how rich these waters are with life -- clouds of juveniles, schools of small Mexican barracuda, the occasional seahorse and frogfish -- and all this despite the threats of overfishing looming in this UNESCO-protected area.

"The nicest folks on the boat became Mr. Hydes underwater when holding a camera. The aggregation and entitlement was magnified every time the divemaster pointed out something."

Guitarfish were common around Angel de la Guarda, as were giant jawfish, whose faces poking out of the rubble looked like comic-book fish. Some held eggs in their mouths and allowed a close look. On the east side of the island, Punta Diabla featured a cut-through that framed the blue water beyond with lush soft corals, as bump-headed Mexican hogfish cut back and forth. Grand vistas gave way to sandy-bottomed comedy as orange pikeblennies engaged in bold nuptial displays. Many sites included meadows of bushy black corals in neon yellow, a far cry from the familiar evergreen black corals.

Further south on Angel de la Guarda, and on the smaller island of San Pedro di Martir, are colonies of sea lions. One reason I love diving is that it allows you to play like a kid, and as playmates go, sea lions function as 700-pound marine mammal toddlers. They came up to my mask, snorted bubbles and enjoyed games like spinning and chasing tails as much as my nieces and nephews do. The waters of San Pedro di Martir were the warmest and clearest of the trip, between 74 and 84 degrees, with rocky bottoms and, as my log attests, "lots of big ass fish."

Being with sea lions highlighted a distinction my buddy and I have long contemplated: divers with cameras. I no longer call them "photographers," because that implies mastery and professionalism. With the advent of digital, anyone can use a camera underwater, and the nicest folks on the boat

Rocio del Mar, Baja California

Diving (experienced)	★★★★ 1/2
Diving (beginner -- don't go)	★
Snorkelling	★
Accommodations	★★★
Food	★★★★★
Service and Attitude	★★★★★
Money's Worth	★★★★ 1/2

★ = poor ★★★★★ = excellent

World Scale

become Mr. Hydes underwater when holding a camera. Because conditions mandated diving in a group, the aggregation and sense of entitlement of the camera holders was magnified every time the divemaster pointed out something. By "aggregation," I mean clusterf****s, traffic pileups that had me cowering on the bottom, covering my head to keep from being kicked. While I used the camera in my head and cavorted with sea lions, most other divers with cameras fought for position and viewed the 360-degree world around them through viewfinders. They missed the joy of play, turning their dives into hunts for usually poor images and inadvertently pissing off their fellow divers with their mono-focused diving for pictures. On most liveboards trips, usually someone is a real jerk. This group

was unusually pleasant, a mix of active and retired professionals, teachers, healthcare workers and rocket scientists, all eager to get along. Yet underwater, these nice people morphed into monomaniacal digital monsters. Note to self: Can liveboards offer camera-free trips that are actually about diving?

Rant over; time to talk about food and service. Rocio del Mar is unusual in not charging for alcohol, though like every good dive operation, the rule is your first drink signals your last dive. In addition to very quaffable beers and wine, they offer frozen margaritas and mixed drinks, as well as plenty of soft drinks and cold hibiscus tea. Though I retired early, some divers stayed up watching movies from the library in the salon. The daily menu was posted at the hot breakfast (which came after continental breakfast at 6 a.m. before the first dive) and combined vegetarian, American, and Mexican offerings. Meals are served plated and attractively garnished, and special diets and requests are accommodated without fuss. Every member of the crew joins in serving meals, and during my week, they hosted two barbeque dinners on the top deck as well. Three tables in the downstairs dining room accommodate all divers, so you necessarily get to know everyone while at table. When barbeque dinners are served on the top deck, tables are six-person picnic-style. The lighting in the dining area is a tad harsh rather than atmospheric.

The level of service makes up for small cabins and few towels. Prefer to gear up on the panga rather than the dive deck? No problem. Want a diet soft drink? A deck towel? Forgot your mask? No problemo. I saw Captain Rey helping out on the dive deck, and divemasters serving meals. I have heard that the boat's owners, Dora and Lolo Sandoval, have worked hard to create a warm, family atmosphere amongst the crew, including firing folks who developed attitudes. The crew's attitude made it easy to dig into my wallet at the trip's end for a good tip (and this trip is not cheap, coming in around \$350 per day).

The last day of my trip was devoted to snorkeling with whale sharks in the national park around the Bahia de los Angeles, about 12 hours steam south of Puerto Penasco in the northern Sea. The waters are murky, the laws strict (no more than four snorkelers per animal) but darned if there weren't whale sharks for everyone. In a lucky fluke, I spent 10 minutes alone with one beast swimming placidly with an open mouth and festooned with remoras. The park fee of \$28 is good for a year at all Mexican national parks, so keep your card.

I would definitely take this trip again, and indeed, I fantasize about the boat's itinerary from the far north to far south. It 's not plush, conditions could suck, and you can get very cold if unprepared. But it's so unusual

here, so remote and so filled with life and variation, one trip to the Sea of Cortés must beget more, if only to immerse yourself in its many personalities.

-- J.D.



Divers Compass: This trip embarked from the Phoenix airport, and the transfer to Puerto Penasco ("Rocky Point") is by vans run by "Head Out to Rocky Point," sufficiently comfortable for the four-hour ride; owners Mike and Lynette went out of their way to retrieve a phone I'd left on a van on the way back (www.headouttorockypoint.com). . . The drive down includes a rest stop where you can buy food and drink . . . There are no land excursions offered on this itinerary, but you can extend your stay at resorts in Puerto Penasco . . . Nitrox is avail-

able for \$120 per diver for the week; on this trip, all save two divers used it . . . All equipment is available to rent, including wetsuits, though to get exactly what you need, alert management before you arrive . . . Website: www.rociodelmarliveaboard.com

Wakatobi Dive Resort, Indonesia

its pricey personalized service has some flaws

Dear Fellow Diver:

Having made well over 1,000 dives, I've enjoyed personal service at a few resorts and on a few liveaboards, but no one does concierge diving quite like Wakatobi. Until, maybe, you check out.

It began with my arrival at the new Bali airport, when my flight from Hong Kong was the fifth jumbo jet to land within 30 minutes of each other. Thankfully, waiting in the jetway was a Wakatobi representative with a sign sporting my name, who escorted my buddy and me through the visa-on-arrival process, then took our passports to clear immigration for us while we waited for our bags. For most travelers, this can take over two hours, but in 20 minutes, we were on our way to Ubud for a week, before returning to the airport to fly to Wakatobi aboard its not-so-special charter. Upon arrival at Wakatobi, our own concierge welcomed us and checked us in. (We weren't special; this is protocol.) There was no dive group feeling about this place, only individual service -- which, I learned later, does put some damper on socializing.

At the dive shop, I was assigned a number for my dive gear and given a box and two wetsuit hangers, which, after being loaded on my designated boat, remained there during my stay. The roomy wooden boat could easily accommodate 20 divers -- tanks were stored down the middle, and benches along the front sides of the hull had storage underneath. A large table at the stern held cameras and dry storage. The boat was totally covered, save for a small area on the bow where I could sit in the sun if I came up chilled from a dive.

We were assigned an experienced and popular Balinese guide named Kummang, who normally works on the Pelagian, Wakatobi's liveaboard. After the boat reached the dive site, most divers would take a giant stride fully geared, but I jumped in without my BC and tank, which the crew would



Wakatobi Dive Resort



hand down for me to don in the water. Upon surfacing, I slipped out of my BC, and they hauled it up as I climbed the sturdy wooden ladder. After the first dive each day, I was handed a hot hand towel, and Kummang offered hot drinks and snacks.

I was on the same boat daily but oddly, none of the other guides (some were Indonesian, the others European, and a few were real prima donnas) interacted with me. Two of four never said a word. Frodo, a Belgian, was the exception, and most nights he held forth at the jetty bar. The Indonesian boat crew was very friendly,

however. On my boat, each guide had been hired privately by their charges (there is no need to do this, since no guide takes more than four divers). This meant four guides providing the same briefing to four groups, while sketching on their own picture boards. Groups jumped in a few minutes apart and stayed separated underwater. Personal attention, for sure, but I missed the usual dive boat camaraderie and interaction with all the divers. At dedicated dive resorts, divers typically gather at the bar before dinner to share their stories, but Wakatobi's only bar was at the end of the jetty, where guests sat at small separate tables, usually just with the people they came with. The lack of contact on the boat extended to the shore.

Service extended to house reef dives. It's easy enough to enter off the dock, but I could also ask for a water taxi to motor me out so I could drift back. If my buddy didn't want to go, Kummang would join me whenever I wanted. I saw many critters on the house reef, including pygmy seahorses, pipefish, scorpion leaf fish and even a large octopus strolling in broad daylight.

My first boat dive, which left at 7:30 a.m. daily, was at a site called Roma, which became a favorite for me. But as they say, first impressions are everything. Having expected beautiful, pristine coral gardens in this out-of-way place, I was taken aback by the mooring line that had settled over lots of dead coral, and for a while I was unable to appreciate much else. But the second time here, I made an attitude adjustment. My buddy and I jumped in with Kummang and cruised away from the dead stuff onto some amazing hard coral reefs where many reef fish congregated. I kicked past lettuce coral larger than a house, and peered out at a school of barracuda numbering at least 200. Schools of surgeonfish and pyramid butterflies filled out the view.

A typical dive was at the site called Blade, which sported thousands of small tropicals. Most of the dives are at some type of wall, but we dived on two large pinnacles separated by a saddle. With 125-foot visibility, I could see the entire saddle and over to the next pinnacle. On my descent, a Napoleon wrasse cruised by and a school of black snapper came my way. Kummang was a fine critter spotter, though there were not many to spot. He found a pygmy seahorse and tiger flatworm, which I saw on most dives. After taking a few shots, I dropped to the saddle at 75 feet, to a barrel sponge almost seven feet tall. (The suggested depth was always 65 feet, but Kummang had no problem with my going deeper, though he didn't.) Fan corals lined the sides of the ridge. At the second pinnacle, I spotted a solar power nudibranch (*Phyllodesmium longicirrum*), a spectacular member of this species. Schools of pyramid butterflyfish, blue triggerfish, fusiliers and others were out feeding in the modest current. Had there been no current, we would have swum back to the mooring line, but the boat came to pick us up.

After the first morning dive, the boat usually returned to the dock for 15 minutes, which gave me a chance to run up to the camera room and change

What Schwarzenegger Movie Title Fits the Lionfish Best?

You might think *Predator*, right? But actually, researchers are using *Terminator* to describe the lionfish that is expanding its range in the Atlantic and Caribbean, due to its ability to quickly outcompete local sea creatures. Kurt Ingeman, a researcher from Oregon State University, says whereas most predatory fish hunt only when prey gather in large numbers and a minimal effort is necessary to secure a meal, lionfish are undeterred by dwindling numbers.

When other hunters move on once a mass of prey has dispersed, lionfish will stick around, hunting a local population to depletion. "Lionfish seem to be the ultimate invader," said Ingeman. "Almost every new thing we learn about them is some characteristic that makes them a more formidable predator. And it's now clear they will hunt successfully even when only a few fish are present. This behavior is unusual and alarming."

Ingeman and his research colleagues observed the hunting behaviors of the lionfish close up by erecting artificial reefs in the Bahamas and watching the predator feed on fairy basslets, a lionfish favorite. It's not clear exactly what makes lionfish so willing and able to keep hunting even when there's no longer a critical mass of prey. Scientists know they're exceptionally efficient hunters, but they may also go unrecognized as predators by locals.

Ingeman says he's hopeful local populations can eventually adapt to the lionfish's presence and avoid being terminated. "There's a strong pressure here for natural selection to come into play eventually. We know that fish can learn and change their behavior, sometimes over just a few generations. But we don't have any studies yet to demonstrate this is taking place with native fish populations in the Atlantic."

batteries or use the head (there is a marine head on the boat). The second dive was usually 15 minutes out. The boat returned around noon for lunch, then departed for the third dive at 2:15 p.m., although once a week, it was replaced by a 5:30 p.m. night dive.

I realized how lucky I was to have Kummang as my guide after I had another not-so-likeable guide for two days. At the Zoo, I was near the sand bottom at 65 feet when I saw a razorfish I wanted to shoot. As I carefully settled in the sand to take my shot, the guide grabbed my arm and started to pull me up. A rude move, and I was surprised. Why? On the surface later, I was told divers were not allowed to touch the sand. Odd, because it was not covered either in the welcome dive chat nor in the rules on the etiquette board by the camera room. In fact, in a dive etiquette pamphlet in each room, one is told it's a good idea to find a patch of sand to shoot a subject, and not touch or lie on the reefs. Other divers told me they too were cautioned underwater to get off the sand, including two marine biologists from Cornell University. None of us knew why, but it's a house rule.

Returning for lunch, I always headed for dry clothes. I walked up my bungalow's three steps to a large porch, with two sofas the size of daybeds facing each other, with a big coffee table in between and a spectacular view of the azure water. Inside the mahogany-paneled room was a comfortable, firm, king-sized bed hung with mosquito netting, perhaps just decoration because I never saw one mosquito. There was a table and chair for writing, plus two armchairs and a charging station. Huge closets sported a small personal safe. The large bathroom had plenty of sink and cabinet space, and a double door led to a private outdoor garden shower and drying rack. Garden bungalows were smaller, but with nice porches and couches. They were similarly furnished, but usually had a view of the beach bungalow in front of them, (number 19 has a view of the sea through the trees). Native plants were abundant just off the clam-shell-lined sand paths.

For a better view of the water, we had two lounge chairs close to the beach



One of Wakatobi's Dive Boats

Wakatobi Dive Resort, Indonesia

Diving (<i>experienced</i>)	★★★★
Diving (<i>beginner</i>)	★★★★★
Snorkelling	★★★★
Accommodations	★★★★★
Food	★★★★★
Service and Attitude	★★★★
Money's Worth	★★★★

★ = poor ★★★★★ = excellent

World Scale

with padded covers and an umbrella between to keep the hot sun at bay. A hammock slung between two trees was a perfect spot for a quiet rest or read. In the great house, i.e., the lobby, there's a nice air-conditioned library. The air-conditioned camera room housed 15 individual prep stations with 110- and 220-volt charging units. The resort can hold up to 54 people, so if a majority were photographers, there might be some wait time. With about 30 guests during my stay, I had plenty of room.

The roomy dining area, open to cool sea breezes, was set with tables for two to four; six tables were set outside in a courtyard. The food was interesting and excel-

lent. Lunch and dinner begin with individual plates of appetizers: Pomodoro salad, tuna tataki sushi, chicken done a multitude of ways. Select whatever you want and more small plates follow. After appetizers, I went to the soup and salad bar, which had small offerings, changing daily. Hot dishes may be a vegetable stir-fry, soufflé or potato dish, and always some type of fish, chicken and beef. Dinner had a carving station: roasted duck or lamb (these were only fair), chicken and a prime rib cooked extremely rare. For lunch, no carving but a pasta-of-the-day offering, with second helpings welcome. And a dessert table with five or six daily offerings, plus six flavors of homemade ice cream. Breakfast had a cereal selection, fruits, breads, a juice bar and fresh blended smoothies (watermelon, pineapple, papaya and mango), as well as eggs to order, pancakes, French toast or waffles. James, the food and beverage manager, kept careful watch over the dining room. Having worked at a Marriott for 10 years previously, he presided over a tight ship, with many of his Balinese or Muslim staffers well-experienced from cruise ship employment. Knowing well how to interact with guests, they even made up names for themselves, like the affable P. Diddy.

After several days of diving, I finally visited the reef I had expected from the brochures and Internet photos. At Cornucopia, the dive guide dropped down to tie up to a mooring, then our group plan was to drift all the way. And drift we did. In 150-foot visibility, I saw that the corals were fully alive and spectacular. Pyramid butterflies were scattered across the entire length of the reef. We dropped down to 65 feet, the preferred depth, and my guide found a pygmy seahorse that I photographed, adhering to the five-photo maximum allowed for each photographer when a pygmy is the subject. (You are also not allowed to use a modeling light or flashlight to look at the pygmies.) The current was running at a quick clip, so I followed the guide, my buddy and two others who had been added to our group, stopping to see a tiger flatworm and not much else. The star here was the coral, and wide angle was the preferred lens. I rounded a point that had schools of blue triggerfish, their fins undulating, the odd group of three or four snapper, and the usual reef fish in greater abundance than at other sites. When I later asked a fellow diver how he liked the dive, he replied, "It was a very pretty reef; too bad nothing lives on it." That is, nothing uncommon like scorpionfish or rare nudibranchs. One site might have cardinalfish, another a cuttlefish if you are lucky, or maybe a long-nose hawkfish. I saw turtles in large numbers at the Turtle Beach site (including two burdened with remoras) and occasionally at others. But for photographing lots of interesting macro critters, it wasn't happening. I did see the odd specialty: a leaf-fish, a scorpion reef fish, one long-nose hawkfish, a devil scorpionfish and luckily, a two-inch ghost pipefish (the first seen in a year, I was told), but sadly, these are few and far between.

I had always thought of Wakatobi as a dedicated dive resort, but it seems to have morphed somewhat into a family resort -- they have a kids' club and a babysitting service -- and for their many snorkelers, they run special boats. They also offer kitesurfing and boat service to a private beach to "get away from it all." They now advertise in Australia as a family resort. Clearly, Wakatobi is no longer a dedicated dive resort.

For me, last impressions are as important as first, and on my last night I got food poisoning. Next day, I learned as many as seven others suffered as well. Thankfully, I missed no dives. Also, the concierge service disappeared. When I arrived at Wakatobi's airport, porters carried all my luggage from the van to the boat for the transfer. Going home, no porters for heavy carry-ons, which meant carting my own luggage up some 50-plus steep stairs to the roadway. Clearly a nitpick, but at Wakatobi's prices, an expected service.

Wakatobi charters a commercial twin prop to carry its passengers back and forth from Bali, and passengers don't have weight limits (in fact, camera gear was often stowed on seats), but it's an uncomfortable craft, too tight when rude folks like those in front of me leaned back their seats and pinned me in. I found a vacant seat, but had to deal with a smelly airplane head. I have no quarrel with such Third World flights, but when touted as a private charter, I'm not impressed. The plane normally works as a scheduled airline, but Wakatobi cannot guarantee departure times. It was no problem that the flight from Bali left 75 minutes late; however, the three-hour-late departure from Wakatobi piled anxiety on top of my relaxing week because I had a flight home to catch, and departure time was tight.

"I always thought of Wakatobi as a dedicated dive resort, but they now advertise as a family resort, with a kids' club and babysitting service."

Staff in Bali helped me to the baggage claim area, but then quickly wanted to bid me adieu. I explained that I had an extremely tight connection and was unsure of the directions to the departing terminal, so they provided me an escort -- and good thing. I walked 15 minutes through the maze of the under-construction Bali airport, and because signage is not in place, I would not have found the gate without help. I was the last passenger on board and shortly after I buckled my seat belt, the plane doors were locked shut.

Overall, Wakatobi is a lovely place to relax, have spa service, excellent food and service, great accommodations and decent diving. Having made seven dive trips to Indonesia, I can say Wakatobi is a good place to start, but it is no Raja Ampat, no Layang Layang in Malaysia, or even Fiji, for that matter. In addition to the fish life I reported above, eels, a black giant frogfish, clown triggers, a half-dozen tridacna clams, lionfish, banded sea snakes, red tooth triggerfish and quite a few crocodile fish were here and there. But not a single shark. And there's no muck diving. Currents are rare, so beautiful soft coral waving around the hard coral pans are rare too. That said, divers not spoiled by the best of the Indian Ocean will love it because there are lots of different species, just not many of each. If I lived in Australia, this would be a staple for me. However, it's a long haul from America. I'm glad I finally made the trip, but for me, the diving doesn't merit a return.

-- S.B.



Divers Compass: My deluxe bungalow for 13 nights was \$13,090, including the flight from Bali, diving and everything but nitrox (\$25 per day) and booze (cocktails or a glass of wine cost \$10-\$12); soft drinks and iced tea are \$3.50, and beer averaged \$5 . . . the resort has plenty of good rental gear; my buddy and I forgot safety sausages, which they provided us

Florida, Maui, Palau . . .

good and bad Bahamas dive shops; the best week to dive Bonaire

Underwater Explorers, Florida. While a lot of divers looking to get wet in Florida's tropical waters head to the Keys, savvy divers go north of Miami, where the Gulf Stream runs closer to shore. In August, Craig Wood (Radnor, PA) dived with Underwater Explorers out of Boynton Beach and reported visibility up to 80 feet and water temperatures averaging 84 degrees. "I spent six days doing 15 dives with Kevin Metz and Underwater Explorers for one of the best dive trips I've had. I did nine drift dives on the healthy Boynton Beach reef, seeing about a dozen bull sharks, numerous loggerhead and hawksbill turtles, green and spotted morays, lobster and nearly all the Caribbean reef fish you can think of. I also did six dives on the Castor. Even though it was a little early for the peak of the Goliath grouper aggregation, there were about 100 around the wreck. There were also large bait balls and all the hunters looking to make a meal of them. Kevin takes out just six divers in his roomy boat, making for a relaxed, uncrowded atmosphere. My reef dives averaged about 75 minutes. Many advanced photographers dive with Underwater Explorers." (<https://diveboyntonbeach.com>)

Tropic Dancer, Palau. Jim McKnight, (Leominster, MA) just returned from a Palau trip aboard the *Tropic Dancer*, and after reading our September feature about the *Ocean Hunter III*, he opines, "Comparing its prices to the *Ocean Hunter*, the *Tropic Dancer* look like the better value to me . . . the cabin for my wife and me was \$2,000 per person. A single occupancy cabin was \$2,600 for one week . . . Beer (Red Rooster, brewed in Palau) was available on tap, and wine was served with dinner, both gratis . . . Nitrox was \$100 for the week. And the itineraries for both boats are pretty much the same." He's right about price: seven days on the *Ocean Hunter III* begins at \$3,495 per person. (www.aggessor.com/palautropic.php)

A Week in Bonaire with Fishid. Jim Reilly (Baltimore, MD), making a return visit to Bonaire in August, stumbled across a week's free program put on by Fishid's Scott and Patti Chandler (and sponsored by Bonaire Dive and Adventure, Den Laman Apartments and Budget Rental Car), and says this is a must-week to visit Bonaire. "The program starts with a fish ID brochure listing the most common fish in Bonaire, then daily morning chats with the Chandlers (lovely, warm folks), four evening presentations on how to identify fish, dives led by the Chandlers on Bari Reef, and prizes for divers who reported sighting the 'fish of the day.' The 7:30 p.m. outdoor presentations were not only interesting and beautifully illustrated, with both still and video shot by the Chandlers, but Scott was also a master teacher who was interesting and fun. Perhaps the most remarkable evening was the one we thought most likely to put us to sleep -- Scott's unedited video from their morning tour. It began with a large pink frogfish blending into a small stand of coral. Bonaire Dive's divemasters were in the audience and gasped, 'Where did you find it?' 'Within 20 feet of the dock,' was Scott's answer. This was followed by video of a good sized, sand-colored eel with brown spots; Scott claimed the sandy lip at the top of the reef had plenty of them. (We've dived Bonaire at least once a year for more than a decade and have never seen an eel like that.) Another was a short video of an octopus attacked by a spotted moray. It was all much fun." Fishid also has a seahorse festival coming up in November at CoCoView in Roatan. (www.fishid.us)

Lahaina Divers, Maui. After 35 years, Lahaina Divers continues to get high marks, and while it's a large operation, it takes care of experienced divers well. Lynda Durfee (Alexandria, VA), who has gone out with them five years running, went again in July and notes, "They are the only operator that makes regular trips to Lanai, Molokai and the Molokini backwall. Lanai sites are probably the best overall as far

as water clarity, topography (cathedrals) and reefs. Molokai and the Molokini backwall are for advanced, experienced divers only, due to currents. Lahaina Divers has two big, comfortable boats. Even with up to 18 divers (the max is 24), it never felt crowded because divers were divided into groups of six, each with a divemaster. They let me go down with the first group and surface with the last group, maximizing bottom time. Lunch (sandwiches, chips, fruit) is served between dives. Very safety conscious, friendly, efficient and you can rinse and store your gear overnight at the shop. The twilight/night dive trip was nice; I got a sunset view, snacks and two dives for the price of a 'sunset cruise' on a catamaran (minus the booze, of course)." (www.lahainadivers.com)

Stuart Cove's Dive Bahamas. Stuart Cove's huge operation, which has been around nearly as long as Lahaina Divers has, doesn't get the same high marks, having succumbed to the call of cash. Michael Tekel (Hampton Bays, NY) says, "It's like Grand Central Station at rush hour. They get three or more buses coming in, cruises, other hotels, etc. Upwards of 60 people in a shot at registration. They mish-mosh everybody to fill boats to capacity -- students, newbies, experienced are all on the same boat. It's all about their sales volume, not your dive experience."

Brendal's Dive Center, Bahamas. Then there is Brendal Stevens, who has been around as long as the others (I first dived with him at Small Hope Bay in 1979) and has been operating his dive center at Marsh Harbour on Abaco Island since 1985. Tiffany Townsend (San Francisco, CA) dived with him in August and, as everyone else who writes us about him, says, "He is a charming and entertaining character, a bit of a local celebrity on Green Turtle Cay. They book out in advance, even during what we thought would be 'low season' (July in the hurricane belt). We were on a sailing trip, and radioed ahead but nothing was available for several days. We were only able to dive because we happened to be hiding out in his shop during a thunderstorm when a group of four called to cancel. Thinking we were signing up for a two-tank morning dive, we only realized once on the boat that we were in for the long haul for a family 'adventure

What to Do with Camera Batteries on Flights

Subscriber A.B. Alexander (Newport Beach, CA) wrote us, "Last year I had all my batteries taken out of my checked bag by the TSA without a note. This year, all airlines say that transporting lithium ion batteries is forbidden. But more and more divers are taking their cameras and lights with them on dive trips. How do you suggest this be handled? Without batteries, no pictures can be taken."

Jeff Janak (Dallas, TX) got his lithium batteries taken out of his checked baggage for an American Airlines flight from Cozumel back home. "Its new checked bag requirements say spare lithium batteries must be removed from checked or gate-checked baggage and carried onboard." Like Alexander, he too never got his batteries back.

It has been in the Department of Transportation's rule books since 2008 that rechargeable lithium ion batteries commonly used by divers to power their camera gear are prohibited from checked luggage. But Joseph Tepper, associate editor of DivePhotoGuide.com, says you can still store them in your carry-ons. "The reason is

simple: If a fire does occur (albeit unlikely), flight attendants will be able to see it and react. This wouldn't be the case if the fire occurred in your checked bags in the airplane's hold."

You can have lithium ion batteries installed in equipment (ie. laptop, cell phone) packed in either carry-on or checked luggage. However, spare batteries must be kept in your carry-on -- they will likely be found and removed from checked luggage. Tepper says he keeps all his lithium batteries in his carry-on photo backpack to avoid the risk that security will nab them. "Also, once you arrive on location, they are more easily accessed and can be charged right away." If there's not enough space to keep both batteries and their charges in your carry-on, move the chargers to your checked luggage.

Also keep in mind that there's a limit to how many lithium ion batteries you can bring on board, depending on their size. For the "small" ones that most cameras use, you can carry on as many as you wish. But for "large" lithium ion batteries (100-160 watt hours), there is a limit of just two spares in most cases, and some airlines require prior approval. Consult your battery user's guide for the watt hours information, and for more specific baggage rules, check your airline's policy page.

day.' My 80-minute dive was limited only by my bladder capacity; we still had 1000-1500 psi at the end of it. The dive was not rushed, and I was able to jump back in and snorkel at the end to take naturally-lit reef shots. Brendal's 'secret' site, Coral Caverns, was great for snorkelers and divers alike. Starting in the shallows, with snorkelers trailing behind, we moved above beautiful, healthy, mature coral reefs, with Caribbean reef sharks occasionally passing, then moved on to watch Brendal put on a show as he got up close and personal with Nassau groupers. He then led us deeper, to 50 feet and past a large group of tarpons, and we passed through a system of swim-throughs sprinkled with thousands of glassy sweepers and beams of natural light shining through. Brendal pointed out beautiful displays of light and tiny macro subjects for the photographers. Following our dive, Brendal cleaned and seasoned fresh hogfish and grouper, while we motored to the beach that has a BBQ pit and picnic tables labeled "Reserved for Brendal's." Soon after arriving, a little girl exclaimed, 'Here come the stingrays!' I slipped in with my snorkel to take pictures as they slid over our legs and feet at the water's edge. We feasted on conch ceviche, fresh green

New Life-Saving Gear for Freedivers

After almost a decade of toiling away in his workshop, veteran freediver Terry Maas, author of the definitive *Blue Water Hunting and Freediving*, has found a way to make freediving significantly safer. In March 2011, he debuted the Freedivers Recovery Vest, or FRV. The system contains an inflatable vest and a handheld programmable computer that constantly monitors a diver's depth and time underwater. If the computer senses that the diver has stayed submerged for too long or has dived too deep, it triggers two carbon dioxide cartridges to fill the emergency buoyancy vest, which flips a diver onto his back and brings him safely back to the surface. Maas is now selling his streamlined second version, the FRV Mark II to the public.

Maas, age 69, is a California real-estate mogul with a private plane and a 32-foot catamaran. But he's also a top spearfisherman who has had his share of close calls in blackouts while freediving. Then, seven years ago, a friend who had lost a buddy to a blackout, called Maas, suggesting a life vest for freedivers be developed. "He thought we could do something with a dead-man switch which, when released, would inflate the vest," Maas says. "The problem, I told him, was most divers receive no advance warning they are going to blackout, and furthermore, their hand might spasm closed over the switch preventing it from operating. We agreed that an automatic system would be better."

Maas started an Internet forum with the idea of collaborating on plans for a simple timed device—stay down too long and the vest inflates. But one contributor pointed out that a diver might easily sink too deep before their time setting was reached. The vest needed a depth maximum as well. Further into his research, Maas realized many freedive accidents occur at the end of the dive, almost immediately upon surfacing. He needed a method for confirming the diver was conscious on the surface. The FRV's "Surface Minder" option makes the diver confirm that by pressing the button on the remote communicator light 15 seconds after arriving on the surface. If the diver is okay, the light extinguishes and the diver is free for another dive. Failure to push the button causes the vest to inflate and to quickly flip the diver onto his back.

When the U.S Navy Seals showed interest, Maas redesigned the FRV into the Mark II model, which uses carbon dioxide cylinders, reducing the weight and size by two-thirds and not interfering with a diver's weight belt. The actuator that fills the bladder provides sufficient volume at any depth the diver chooses (up to 330 feet). The actuator is tucked away on the diver's back, and one communicates via a small lighted-button module worn on the bicep. The bright light indicates when a dive has ended, and it blinks when the button needs to be pressed. The remote connects with a short wire running back to the vest near the armpit.

The FRV Mark II is for sale -- at a hefty \$1,500 -- on Maas's website (<http://www.oceanicss.com>). "The Mark II is a sophisticated tool that can be very useful to those who regularly do breathhold diving," says Maas. "But for scuba divers, I'd recommend taking some freediving classes before purchasing this."



salad, stewed fish and coconut bread, washed down with rum punch, with our new friends. Of the various sites we dove in the Abacos, the reefs at the Coral Caverns, north of Green Turtle Cay, were among the healthiest." (www.brendal.com)

What's with Fiji's *Island Dancer II*? We wrote about its serious problems in our July issue, only to hear from subscriber Angela Richards Dona (Honolulu, HI), who was aboard later that month. "The biggest disappointment is the yacht itself . . . My husband and I had a very strong sewage smell in Cabin 2 and moved to Cabin 3 when it was apparent the crew could not fix the problem. The smell was so strong at times it made me gag. Cabin 3 did not have a functioning A/C unit, but the smell was milder though it was always present . . . Nitrox fills were generally between 28 and 30 percent. We paid \$100 for Nitrox and the fills should have been closer to 32 . . . Tank fills were contaminated, and all tanks had to be emptied and refilled, causing us to miss a dive on our first night. A bad taste was ever present, but got better after the first day . . . The windlass on the anchor broke, and we were stranded in choppy seas at anchor for 18 hours. We missed two dives, and after the anchor line was finally cut, we resumed diving. Captain Joji tried to give us time to make up these dives, but that came at the expense of the village visit that we were all keen to do . . . The diving platform was filthy with black oil splotches. I got these all over my gear . . . Tanks took forever to fill. There were only seven guests plus the divemaster, but we almost never did our dives on time. We all felt the crew was kind, helpful and did a great job with great attitudes despite the problems. The boat was at port for two weeks prior to the week I was aboard, and it would seem that so many of these issues could have been taken care of . . . I wrote a stern but courteous letter to the Aggressor Fleet, and their response was they are not responsible for how the individual boats are run because they are all franchises. The management blamed most of the issues on the crew, and even wrote back a defensive, inaccurate account of the issues. They simply issued us a \$200 voucher, which expires in one year, to try them out again since, as they put it, 'the trip didn't live up to your expectations.'" Angela had a lot more issues on her list, but these are enough to persuade me not to board this craft.

P.S.: I erred in reporting on the *Dancer II* in the July issue, referring to it as the *Fiji Aggressor*. It's part of the Aggressor/*Dancer* fleet, but it's named the *Island Dancer II*. My apologies.

-- Ben Davison

Anatomy of a Dive Death

how coroners figure out why divers met their end

Ken Kurtis led the panel "Why Divers Die" at the Scuba Show in Long Beach earlier this summer, about dive fatalities in Los Angeles County in 2013. Kurtis, owner of the dive shop Reef Seekers in Beverly Hills, is also the scuba consultant to the Los Angeles County Department of Medical Examiner-Coroner, which has had this position since the 1950s (UCLA professor Glenn Egstrom, a dive research pioneer, was the first, and held that spot for 40-odd years). Because coroner reports in Los Angeles County are public record, starting in the mid-2000s, the department gives a public accounting of the fatalities occurring in its jurisdiction. In this article, Kurtis describes how the department handles investigations and uses evidence and deduction to come up with rulings, then provides a sample of cases it handled last year.

In Los Angeles County, all dive deaths are initially treated as a possible homicide, so one of the Sheriff's first tasks is to make a determination in that regard. The responding sheriff takes control of all dive gear, takes witness statements, may test the gear or turn it over to the Medical Examiner-Coroner, and then transports the body to the ME-Corner's facility. Coroner investigators will conduct their own interviews and receive copies of reports from the various first responders, while Coroner physicians perform an autopsy that includes toxicology screening. The ME-Coroner's goal is to determine the cause of death within

Does Diving Affect Your Hearing?

Ear injuries make up about 65 percent of dive disorders. Decompression sickness can affect the inner ear, where inert gas bubbles form and grow. Barotrauma can occur when divers have trouble equalizing pressure in the middle ear during a descent. But what's the long-term effect of regular diving on one's hearing? While a lot of old-time divers seem to blame their hearing loss on diving, it just isn't so. The most recent studies of the topic provide a pretty consistent answer: long-term diving doesn't have much of an effect on hearing.

In a recent study, researchers tested the hearing of 748 military divers in the Singapore Navy enlisted between 2001 and 2010, who averaged 200 dives over two years to maximum depths of 100 feet. Pre-enlistment and pre-discharge audiograms were used to evaluate their hearing thresholds. The divers' hearing levels in the left ear were not affected, except for a marginal decrease in hearing at the 2,000 Hertz level. In the right ear, there was a marginal decrease in hearing at the 500Hz, 1,000Hz and 2,000Hz level.

Overall, there were more low-frequency changes compared to high-frequency changes (4,000Hz and

8,000Hz) changes in both ears, with a larger number of changes noted in the right ear. However, no diver had a hearing threshold increase greater than 20 decibels, or exceeded the hearing threshold levels required of military divers. The researchers concluded that these changes were only marginal and without physiological significance.

The above is consistent with slightly earlier study findings from researchers at the University of Heidelberg in Germany. In papers for the journal *Undersea and Hyperbaric Medicine*, they concluded that, in sport divers without any history of scuba-related ear injury (e.g., barotrauma), neither central nor peripheral hearing appeared adversely affected to any significant degree.

In short, diving-related hearing loss is largely limited to commercial divers who are exposed to loud noises, and divers who have experienced barotrauma of the ear. The recreational diver who equalizes appropriately and sustains no ear injuries doesn't appear to be at significant risk for diving-related hearing loss or tinnitus.

-- Doc Vikingo

"Does diving affect the hearing of Asian military divers? A study in the Republic of Singapore Navy," by J. Chang, G. Chan and KC Tang, Undersea and Hyperbaric Medicine, vol. 41, no.1, pgs. 41-46.

reasonable medical certainty. You could have two people look at the same autopsy and test results and come up with two different opinions, so it's important to remember that what the Coroner is producing is an informed medical opinion, based on the evidence available at the time. Its conclusion is not an assessment of legal responsibility.

From a diving standpoint, a Coroner's finding does not always tell us much. While "drowning" may indeed be the medical reason for the death, it is a sometimes unsatisfying conclusion to divers looking for answers. Divers Alert Network (DAN) has come up with a four-step process that involves:

- 1) Trigger -- what got everything started;
- 2) Disabling event -- what the trigger caused to happen;
- 3) Disabling injury -- produced by the disabling event; and
- 4) Cause of death.

One of our cases involved a 14-year-old child whose official cause of death was listed as drowning, but when we applied the DAN model, we got:

- 1) inability to clear water from the mask;
- 2) bolting for the surface while holding breath;
- 3) embolism; and
- 4) drowning.

Even though the cause of death is still the same, from a diving perspective, it's now a more complete picture.

Multiple Choices? Use Occam's Razor

None of this is black and white. Most diving fatalities happen outside the direct view of someone else. This can be because of inadvertent buddy separation, solo diving, or simply that the buddy was not looking in the victim's direction when everything went south. We sometimes say that the dive computer is the only unbiased witness in any diving fatality investigation, but even then, it doesn't give us a complete picture. The computer may not be downloadable, or perhaps the memory chip overwrote itself if the victim was underwater and not recovered for a long time, or it was mishandled. So we also have to rely on the statements from others who were there, the physical evidence that can be recovered and what can be gleaned from that, and our own experiences and intuition about how divers dive and what may have happened.

We had a case years ago where the accident happened at the beginning of the dive. The victim was recovered from 50 feet, with his leg entangled in the anchor line of his boat. His tank was full, but his air valve had been turned off, and he wasn't wearing his weight belt. What happened? Karl Huggins, director of the Catalina Hyperbaric Chamber, and I are both fond of the principle of Occam's Razor: When faced with multiple hypotheses, generally the simplest one will be closest to the truth. In this case, the simplest theory was that, before the dive, this guy turned on his air, checked it, then turned it off and eventually jumped in without turning it back on. However, the other people on the boat swore there was no way this had happened, that no one saw him turn his air off, that he wouldn't do that, that he was experienced, etc.

The victim was at 50 feet, leg entangled in the anchor line. His tank was full, but his air valve was turned off and he wasn't wearing his weight belt. What happened?

So we first tested the theory of whether he could have gotten to depth on "no" air. It seemed possible, as our surface tests showed about six breaths of air may remain in the hose of a regulator if the tank valve had been turned on and then off. Then, with a pony bottle under my arm and a buddy with an octopus at my side, I did a practical test in the ocean, using the same gear with the air turned on and then off. I made it down to 47 feet. So it seemed our theory had some merit. Now we had to find evidence to support it, despite what his friends on the boat said. After talking to others he dived with, we found a couple of dive buddies who said he not only did that all the time, but they had also seen him forget to turn the air back on. He would just reach back and open the valve underwater once he'd sucked all the air out of the hoses and realized his air wasn't on..

Because the tests and interviews supported our theory, it seemed a reasonable assessment of what had transpired.

Trigger: Turning off the air.

Disabling event: Breathing all the air out of the hoses and not being able to turn the air back on.

Disabling injury: (moved down from above row) Anchor line entanglement, with possible loss of weight belt while attempting a free ascent, resulting in water inhalation.

Cause of death: drowning.

A lot of this comes down to diver error. A few years ago, I looked at three years worth of DAN reports (347 fatalities) and came up with 69 percent as the number of fatal dives in which diver error played a significant -- and deadly -- role. If divers made better decisions, paid closer attention to our air and stayed on top of our medical issues, we could eliminate a lot of scuba deaths overnight. You will see these three things factor in to the four Los Angeles County fatalities from 2013.

Case #1: Toughing It Out Instead of Sitting It Out

A 54-year-old man, who had earned his basic openwater certification 10 months earlier, was diving the

Sujac wreck near Catalina Island with an instructor and a buddy. It was their second attempted dive of the day; his first dive was a struggle, and he aborted after only a few minutes, at 20 feet. He and his buddy took a two-hour lunch break and returned for a second attempt, but he was reportedly winded at the top of the entry stairs, as well as at the bottom. While snorkeling out to the wreck's descent buoy, he became unresponsive on the surface and was extricated from the water by a Harbor Patrol boat. CPR was started, and he was transported to the Catalina Hyperbaric Chamber, but was pronounced dead upon arrival.

The buddy is certain that the victim never submerged, but his dive computer clearly showed his last dive was made to a depth of nine feet for zero minutes.

His medical history included high cholesterol, high blood pressure, heavy smoking and experimental drug abuse in the past, and obesity. His autopsy revealed a heart weighing 650 grams (anything over 400 grams is considered problematical). Cause of death: Acute cardiac dysfunction, due to a weakening of the heart that eventually leads to heart failure). This was ruled death due to natural causes. In other words, it was his time and he

just happened to be in the water.

My take on this: There are just some times when you shouldn't dive. Problems descending on the first dive followed by being winded at the start of the second dive might give you pause. Sometimes the thinking process needs to be, "I'm going to sit this one out" instead of "I can tough this out." There's no saying the outcome would have been any different, but if a diver has any cardio-related issues, he or she probably has a better chance of surviving if the issues occur on land rather than in the water.

Case #2: Was He Fit Enough to Freedive?

A 44 year-old man was freediving and spearfishing with a buddy at Terranea Resort in Palos Verdes when he shouted that he was having trouble breathing. He pulled himself on to the rocks and became unresponsive. The buddy began CPR, but when paramedics arrived, they pronounced him dead. His medical history included hypertension, high cholesterol, and a heart attack seven months earlier. The autopsy revealed a 500 gram heart, severe hardening of the arteries in the abdominal aorta, and 85 to 95 percent blockage of the coronary arteries. Cause of death: atherosclerotic cardiovascular disease, and a ruled death due to natural causes.

My take: Again, it's a question of being aware of your fitness level and if the dive is an appropriate one to make. Freediving, especially when spearing fish, can be very taxing, even for someone in good shape. But factor in a heart attack seven months prior and perhaps it's an activity that diver should have reconsidered.

Case #3: Accidents Can Happen in an Instant

A 60-year-old man was diving with a buddy at White Point, Los Angeles. He had been certified over 30 years ago, but the last time he went diving was unknown. He and his buddy aborted their first attempt at entry, due to rocky conditions and the buddy losing a fin. During their second attempt, the victim was placing a float with a flag in 20 feet of water but the buddy was uncertain if he ever submerged or simply dropped the weighted float line to the bottom. At some point, the victim called out for help and became unresponsive. He was extricated from the water and bystanders began CPR. He was transported to a nearby hospital and pronounced dead in the ER. Autopsy revealed only 25 percent blockage of the coronary arteries, which is not at all bad for a man his age. The cause of death was listed simply as drowning.

My take: This case underscores how accidents can happen in an instant. But it also points out the difficulty in trying to ascertain exactly what happened. The buddy is certain the victim never submerged, but when we looked at his dive computer, a non-air-integrated U.S. Divers Matrix, it clearly showed the last dive was made to a depth of nine feet for zero minutes. The time is easy to explain because the Matrix shows hours and minutes but not seconds. That means it doesn't register "0:01" until 60 seconds have elapsed, so you could do a dive for up to 59 seconds and it would still register as "0:00." But the Matrix also

does not time/date stamp dives, so we have no way of knowing when this last dive actually occurred. And it was not downloadable, so all we could do is look at the display. Had this actually been his last dive, he might have descended to nine feet, had a problem and panicked, held his breath on ascent, embolized and then screamed for help when he surfaced. The buddy was putting on his fins and not facing toward the victim, so it's possible. But the buddy was fairly certain that the victim never went underwater, so we're left with the other possibility of him inadvertently gulping water at the surface, which caused an adverse reaction and led to his death. While an embolism can be detected at autopsy, vigorous CPR can also cause the same tissue damage as an embolism would. So it's difficult to say exactly what happened.

Case #4: Were Lobsters More Important than Air Supply?

A 60-year-old male went lobster diving with a buddy at Dockweiler State Beach. While 250 feet from shore, and diving inside a support structure that is underneath an intake water pipe, he became separated from his buddy. The buddy returned to the beach and called for help. Dive rescue teams located his body wedged in that enclosed structure under the pipe. Due to dangerous surface conditions and the difficulty of extrication, plans were made to recover his body the next day. When rescuers returned, they discovered his body floating at the surface offshore, but without any gear. His body was recovered, but, due to still-dangerous conditions, no attempt was made to retrieve his gear. Autopsy revealed 50 to 75 percent blockage of the coronary arteries. Cause of death: drowning with underlying atherosclerotic cardiovascular disease.

My take: Because the gear was never recovered, we couldn't test it. However, he was wearing a downloadable air-integrated wrist computer, so we were able to view the profile of the fatal dive. It shows a gradual descent down to 35 feet, then the depth bounces rhythmically between 35 and 33 feet. Because he was in an overhead environment that didn't have a lot of height, this depth fluctuation could simply be a result of waves passing overhead. What was most striking was the air consumption portion, which shows a fairly steady and regular decrease in the air supply to the 47-minute mark, seemingly indicating a normally-breathing diver up to the point where he exhausts the air supply. Even then, there doesn't seem to be an increase in the rate of breathing, which you might expect to see if someone knew they were stuck and running out of air. The evenness of the air supply graph could indicate someone so intent on hunting for lobsters that he wasn't closely watching his air, and inadvertently ran out. Because he was in an overhead environment, there's no way to reach the surface. So while we can construct possible scenarios, it's impossible to say with certainty which one is what happened.

The goal in publicly presenting these cases is with the hopes that you will examine your own diving behaviors, and, if you see some parallels, perhaps rethink the steps you can take to insure that you do not appear in one of *Undercurrent's* "Why Divers Die" articles.

Choosing a Safe Liveaboard

don't just pick one for the large cabin and camera room plugs

Some years ago, I was asked to write a feature about the worst liveaboards in the world. It was easy. I didn't need to do much research. I simply wrote about the ones I had experienced and, shamefully, even one that I had worked on as a dive guide.

Many divers tend to be rather naïve when making travel decisions (unless, of course, they read *Undercurrent*). They are led by marketing hype, brand image and features that are important to them personally. When they choose a liveaboard for a diving trip, they are often keen to confirm that the cabin will be large and comfortable enough, the food will be to their taste, and that the vessel looks like their idea of the sort of luxury yacht that will make their friends and neighbors envious of their dive trip. Quite rightly so.

However, recent tragedies that have happened in the world might give us pause for thought. Who would have thought that a magnificent luxury cruise liner would run into a reef near an Italian island and turn turtle? Or that a modern Boeing 777 would simply disappear in flight, or that another would be brought down by a missile? When we choose a liveaboard, we should remember one very important aspect: It is not simply a hotel, it's a vessel floating on the surface of the ocean, and only by the grace of Archimedes' principle.

Coming back from a dive to find that your mother ship no longer exists is an experience that will live with you forever. Abandoning a vessel during a trans-ocean crossing is not something I'd recommend as a character-building experience. Swimming with nothing more than what you were wearing in your bunk (mainly nothing) because your vessel went down in the night might save your life but it takes the edge off your vacation. You might think that these are extreme examples, but they have all happened recently and on more than one occasion. (As proof, read my most recent story, "Fire Aboard!" in the August issue.)

So what tips can I give you to help think about choosing a safe liveaboard?

First, there are mainly two types of hull construction, wood and metal (usually steel but sometimes aluminium). Wooden vessels are quick and cheap to construct, and easy to repair -- but then, they need to be. Back in the early '90s, the steel-hulled motor yacht *Lady Jenny V* that I worked on as a dive guide in the Sudan ran onto the reef top nearly every night when the wind changed, and the impossibly difficult skipper refused to accommodate that idea when we moored. If we had been in a vessel with a wooden hull, it would have been damaged, possibly fatally, the first time. But the heavy German steel of our vessel took it out on the reef each time rather than the other way around. We crew only had the regular task of pulling it off as soon as we heard the first telltale groaning sounds that were only matched by our own when our much-needed sleep was interrupted. Today, most Egyptian liveaboards are built from wood, and despite being finished to afford the height of luxury for the passengers, the Red Sea is littered with the remains of those that "touched" the reef.

That said, nothing sinks quicker than a steel vessel full of water, which is where water-tight doors become essential. If a vessel is divided into sections separated by water-tight doors, safety in a worst-case scenario can probably be assured. I remember the owner of the newly-built steel *MV Oyster*, proudly showing me around and pointing out a water-tight door at one end of the companionway below decks, but being unimpressed when I pointed out that the stern end had no such protection and was effectively open to the sea. After some years of operation, that otherwise lovely yacht lies on the seabed near the reef it hit.

Hull shape can be important, too. If the vessel is likely to meet anything more than a glass- calm sea, it will need to be a "dry" boat -- water should not pour down the decks, and it should not roll so alarmingly that passengers are left clinging to their bunks. Wooden vessels tend to bob on the surface, while steel hulls plough through the waves. Wooden vessels are lighter and can be faster, while steel-hulled vessels are often more ponderous but more stable in rough water. Ask about the sea-keeping qualities of the vessel.



Panorama Explorer: Sunk on Its Maiden Voyage

I was once in the Red Sea on board the maiden voyage of the motor yacht *Moon Dancer*, a member of the Peter Hughes Dancer operation. One passenger expressed disappointment that the sea was so rough. The newly arrived American captain, with lots of experience in the Caribbean, told her he couldn't understand it. "The Red Sea was usually flat calm," he said.

Surrounded by deserts on all sides, that body of water is subject to gale-force winds most of the time. Close to the western shore, it may be calm, but out at sea, it's

Father and Son Divers Sue the Boat that Hit Them

The father and son run over by a dive boat's propellers in August 2011 have filed a federal civil lawsuit against the Florida Keys Dive Center, one of its boat captains and crew. Jared C. Adkins, then 39, of Harrington, DE, was with his 11-year-old son, Calvin, when they were run over by the 46-foot *Big Dipper* just after getting in the water near Conch Reef, nine miles south of Key Largo. Both suffered severe injuries and required emergency surgery after being airlifted to Miami hospitals following the incident. The Adkins' attorney, John Hickey of Miami, said Calvin suffered permanent brain injury due to the incident. Named in the lawsuit are Florida Keys Dive Center, boat captain John Brady, mate John Burton and the dive center's operators, Thomas and Pamela Timmerman.

The Adkinses were taking part in a drift dive with about 15 other people, with the boat drifting as well, according to Florida Fish and Wildlife Conservation Commission reports of the incident. Both father and son were in the water off the stern of the *Big Dipper* when it ran them over. The lawsuit states that Brady left the engines running while the crew put divers in the water at three different locations. The Adkinses entered the water at the last location with their gear under the direction of crew.

"When [the Adkinses] were in the transom of the vessel and after they jumped into the water, the master and his mate and divemaster did not communicate properly with each other and did not maintain a proper lookout," the lawsuit states. "Yet, the master put the engines in reverse and moved the vessel back over the two divers."

Hickey alleges the position of life rafts and layout of the *Big Dipper* made it so that "the person sitting at the helm could not see the transom of the vessel or anyone in the transom of the vessel." He further alleges the charter company failed to keep a proper lookout of divers and failed to provide a properly trained captain and crew, which ultimately led to the incident. He also alleges the Florida Keys Dive Center "misrepresented" facts on its website, mainly that "the personnel were not all employed by and were not 'of' the Florida Keys Dive Center." "We believe this is a situation where the crew are paid as independent contractors and I think there's a little bit of shell game," Hickey said of the allegations regarding the website.

The lawsuit will be heard before U.S. District Senior Judge James Lawrence King. A court date has yet to be scheduled.

-- Adam Linhardt, The Key West Citizen

famous for its short chop. It's only calm for two short periods in the year when the wind changes from north-west to southeast. That's an example of when the experience of the skipper and crew can be vital. Don't be afraid to ask how long the skipper has been in charge. This particular captain might have been otherwise extremely competent, but he was obviously deficient in knowledge of local sea conditions, and it wasn't long before he was substituted for an experienced Egyptian. Your life can be in the hands of the skipper. You might remember that in Belize back in 2001, the *MV Wave Dancer* sank in the night during a hurricane. Twenty passengers and crew members lost their lives when the captain failed to make the correct judgement in disembarking the passengers before the storm hit.

Safe open ocean crossings demand the safety of two engines. A vessel without motive power is a vessel at risk. If your itinerary remains close to shore -- and help should you need it -- a single-engine vessel will probably be safe enough. A good example of this is any vessel working within the weather-protected atolls of the Maldives, where the mother ship is usually closely and permanently accompanied by a large 'diving dhoni.' Other examples might be vessels working within the calm lagoons of Palau or Truk. Consider the intended route, ask how many engines a vessel has and make an informed decision.

Should it be intended to make a long ocean crossing, like the one to Cocos Island from Costa Rica, a single engine is one too few. I have been amazed to see a local bangka boat, constructed mainly from bamboo poles and fishing line and powered by a single improvised truck engine, hundreds of miles from shore at Tubbataha Reef in the Philippines. Some popular vessels that were designed with a single engine, in the style of those working safely within the close-knit islands of the Indonesian archipelago, have recently

been fitted with an auxiliary engine to satisfy safety requirements. But I wonder how easily they are steered when the propeller of this extra engine is set well to one side of the rudder.

You'll want to know about generators and water-makers, because while running out of either electricity or water can be very inconvenient, the loss of generators can be disastrous (I know! It happened when I was aboard the *MV Kairos*.) You need to know that the vessel has more than one generator. Much of the vessel's essential equipment depends on their ability to deliver.

One night, I ventured up into the wheelhouse of the Turkish liveaboard *Artemis* and discovered to my horror that it was unattended, with the wheel simply lashed in place with rope as we motored onwards. Thankfully, most vessels now have good navigation equipment, but it still depends on the crew's ability to use it.

As a Red Sea dive guide back in 1992, I always marvelled at the way the passengers slept soundly in their cabins while we made night crossings. Apart from the captain and me, the crew were all "backpackers" working their passage in exchange for some free diving. None of them was competent to drive the boat, but they each had to take a turn in the wheelhouse. We had autopilot, radar, a compass and the new-fangled GPS, so it should have been simple, but it seemed to me that every night when I took over, I needed to avert an otherwise imminent disaster. One night, all the passengers fell out of their bunk when our "engineer" suddenly realized he was about to hit the shore and turned the vessel so abruptly he nearly sank it. It should never have happened. So ask about the competency of the crew.

Communication equipment is vital. Does the vessel have a powerful marine VHF radio, and are all the passengers briefed on a Mayday procedure before setting off? It's not good having the means to make an emergency call if the only person who knows how to use it is incapacitated or fallen overboard. Are the life rafts regularly serviced? I was recently on the fabulously well-appointed boat *MV Orion*, but realized after a couple of days, there were no life rafts. (There are now!) People never like to think about these things. Let's hope you never have to.

Finally, what medical facilities are there, and what happens if there's the need for an emergency evacuation? All good passenger vessels, whether small liveaboard motor yachts or vast Italian cruise liners, should give passengers a proper safety briefing before leaving port. Evidently, the passengers of the *Costa Concordia* were due to get one on the third day of their trip, and that was after disaster had happened.

Ask the questions and get the reply in writing before you book.

John Bantin is the former technical editor of DIVER magazine in the United Kingdom. For 20 years, he used and reviewed virtually every piece of equipment available in the U.K. and the U.S., and made around 300 dives per year for that purpose. He is also a professional underwater photographer, and most recently the author of Amazing Diving Stories, available at www.undercurrent.org

PADI's Wicked Ways

throwing a divemaster under the bus, and colluding with plaintiffs

PADI's money-making Discover Scuba Diving course (DSD), once simply called a resort course, is on trial, and it looks like PADI will do whatever it can to protect it -- even if it means throwing a PADI instructor under the bus, and operating secretly and illegally behind the court judge's back.

PADI instructor Corbett Douglas, who worked for Blue Water Scuba, based in Logan, UT, had four divers -- two Boy Scouts and their scoutmaster -- under his charge in a DSD course in Utah's Bear Lake in July 2011. During the introductory dive, one Boy Scout had anxiety problems, as apparently did the scoutmaster, and Douglas was faced with a choice: guide the two anxious victims back to the

surface or let them go on their own. Because the other two scouts seemed stable on the bottom, he guided the two troubled divers to the surface. By the time he returned, one of the boys he left behind, David Tuvell, had drowned.

DSD programs have an accident rate more than twice that of PADI's standard openwater certification courses. As Bret Gilliam wrote in *Undercurrent* back in March 2012, a big problem lies with the standard: Only one instructor may lead up to four divers. Should a diver get into trouble, the instructor must either let him head to the surface alone or go with him and leave the other divers unaccompanied. Gilliam argued that two instructors were essential for safety, which would also permit the groups to be much larger, with as many as a dozen divers.

"If there is an issue over how Tuvell died, it is the standards of the Discover Scuba Diving program."

Less than two weeks after the death of David Tuvell, PADI publicly expelled Douglas (an Iraq veteran and schoolteacher) for life as a PADI instructor, but refused to explain either publically or to him personally how he had violated PADI standards. Also, no witness statements had been conducted, and autopsy reports and police reports had not yet been made available. PADI then made an issue out of Douglas at a large DEMA gathering -- it had determined that "his continued membership was not in the best interests of PADI." Corbett, however, was following PADI procedures: He had four students and he served the troubled divers. And that's what may really be on trial -- whether the DSD program is, in fact, a faulty, unsafe program.

The case went to court, naming Douglas, Blue Water Scuba, PADI and the Boy Scouts as defendants. PADI has argued that the Blue Water defendants are solely responsible for the death, not the standards of its DSD program.

David Concannon, the attorney representing Douglas and Blue Water Scuba, told *Undercurrent* that he repeated the fatal dive, and spoke to witnesses and medical examiners, but can't find that Douglas violated any standards. "If there is an issue over how Tuvell died, it is the standards of the DSD program . . . It does not tell you how to make a safe ascent. It does not tell you how to stay on the surface. It does not tell you to drop your weights and maintain your buoyancy. None of this information is given to the participants. The instructors are not allowed to deviate from that."

However, the judge later learned that PADI had colluded with the plaintiff's attorney and arrived at a secret settlement with the plaintiffs, David Tuvell's parents. In that confidential agreement was a clause in which PADI denied responsibility and agreed with the Tuvells that its members were responsible for the boy's death. Another provision in the settlement allowed PADI to stay in the case for as long as PADI wanted so it could "clear its name" and defend against any allegations that the DSD program was defective.

PADI's motives? One theory is that the agency made the confidential settlement to get itself out of the case as a defendant so that the court couldn't scrutinize the inefficiencies in the DSD curriculum.

The other motive is to get rid of the competition for insuring PADI dive instructors, says Concannon. Here's how it's structured: Each major dive agency has its own insurance program and offers liability insurance to its instructors as part of membership. The agency, in turn, presents its instructors to an insurance broker (PADI's preferred broker is Vicencia & Buckley), who then finds underwriters to fund the insurance program. The underwriters charge a premium, which is passed on to the instructor, and the broker takes a commission from the premium and shares it with the dive agency.

Two years ago, PADI was bought by a private equity firm, which soon realized it had overpaid for a dive training agency that had rapidly declining enrollment numbers -- the lower the number of

instructors purchasing insurance through PADI, the fewer commissions, and thus, revenues collected. But PADI couldn't raise membership rates or hike insurance premiums for its dive instructors because it was competing with other insurance underwriters, primarily Willis Recreational Diving Insurance, on the basis of price. Although Blue Water Scuba is a PADI dive shop, it chose Willis as its insurer, and listed Corbett Douglas as a person to insure under its plan. "If he was insured by Vicencia & Buckley, Douglas would never have been expelled, PADI would have vigorously defended him," says Concannon. "But here was a case to make Willis spend a lot in defense costs for a big verdict. PADI couldn't resist competing with Willis on this basis. If Willis quits brokering insurance to the diving industry, Vicencia & Buckley can raise prices because it no longer has to compete."

Thus, PADI entered an agreement with the plaintiffs, David Tuvell's parents, that made them amend their original complaint to settle some claims against PADI and keep the agency a party to the case, reviewing documents and advising the Tuvells how to hold Douglas and Blue Water Scuba liable. But PADI is not doing so as atonement to the deceased's grieving parents, says Concannon. "There's no legitimate reason for PADI to do that other than to make Willis spend their profits and lose more money just to defend the case and find the instructor is not liable. By getting rid of the competition, PADI can finally raise its rates."

After finding out about the secret agreement, the judge threw out the plaintiffs' amended complaint earlier this year, saying that "PADI and their Counsel unnecessarily multiplied the proceedings . . . [and] set off a series of answers, cross-claims and third-party claims that were unnecessary." Despite the collusion, the judge seemed to let PADI off earlier, making it pay the Blue Water defendants \$2,000 to compensate them for legal fees paid to defend themselves against that amended claim. But PADI still intends to stay as a party in the case -- Concannon says the plaintiffs filed a motion to do so, and a hearing on that will be held October 14.

Looks like PADI got its wish even before the case goes to trial. Earlier this summer, Willis announced it was dropping out of the dive insurance industry, leaving just one other -- smaller -- underwriter as PADI's only competition. "The ultimate result of this trial will not be about a family winning a case against [an] instructor," says Concannon. "It's that now an instructor suddenly will have to pay a lot more for liability insurance because the only place to get it is through PADI-sponsored insurance."

We called and e-mailed PADI's vice-president of marketing and communications, Kristin Valette, to get the dive agency's reply and point of view, but she didn't respond.

- - Vanessa Richardson

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