THE WORLD'S MOST DANGEROUS ROOM

THREE AND A HALF YEARS AFTER A CATASTROPHIC MELTDOWN, FUKUSHIMA IS FAR FROM FIXED

BY HANNAH BEECH/FUKUSHIMA

PHOTOGRAPHS BY DOMINIC NAHR FOR TIME

Ground zero
The abandoned control room for Reactors 1 and 2, both of which overheated and suffered meltdowns

Wasteland *Dead cattle—culled because of radiation—are buried in pits within the Fukushima exclusion zone*

OUR GAS MASKS ARE ON, AS ARE THREE PAIRS OF GLOVES SECURED WITH TAPE, TWO PAIRS OF SOCKS, RUBBER BOOTS, A HARD HAT AND A HAZMAT SUIT

that encases our bodies in polyethylene. Ice packs cool our torsos, but photographer Dominic Nahr, reporter Chie Kobayashi and I start sweating. Maybe it's nerves, or maybe it's just the sticky humidity of summertime Japan.

Soon we approach the Fukushima Daiichi nuclear power plant—ground zero of the worst atomic meltdown since Chernobyl. Dosimeters around our necks record the rising levels of radiation. After the 9.0 earthquake and subsequent tsunami on March 11, 2011, the aging plant on Japan's northeastern coast suffered a total power failure, causing the cooling system to shut down. Three of the station's nuclear-reactor cores overheated, sending plumes of radiation over a placid landscape of fishing villages, rice paddies and dairy farms. (The station has a total of six reactors. Two were in cold shutdown at the time of the accident; another, which had been defueled, suffered an explosion.) As we lumber through the plant like clumsy B-movie extras, I'm reminded that our many layers don't protect against every type of radiation. Not to worry, we are told by officials from Tokyo Electric Power Co. (TEPCO). The radiation levels in certain parts of the nuclear complex are actually lower than in some populated swaths of Fukushima prefecture. Later, as I sit in a futuristic cubicle in the plant complex, undergoing a full-body internal radiation check, the soundtrack underscores TEPCO's soothing message. A line from one song's lyrics, tinkly and sweetened: "You've got a friend in Jesus."

Three and a half years after the most devastating nuclear accident in a generation, Fukushima Daiichi is still in crisis. Some 6,000 workers, somehow going about their jobs despite the suffocating gear they must wear for hours at a time, struggle to contain the damage. So much radiation still pulses inside the crippled reactor cores that no one has been able to get close enough to survey the full extent of the destruction. Every 2½ days, workers deploy a new giant storage tank to house radioactive water contaminated after passing through the damaged reactors. We wander past a forest of some 1,300 of these tanks, each filled with 1,000 tons of toxic water, some of which was used to cool the reactors.

Leaks have plagued the site. In February, water with a radiation level several million times higher than what's safe gushed out from a storage tank near the coast on the Pacific Ocean. TEPCO said it was unlikely the water made its way into the ocean, but whistle-blower workers aren't as sure. There's the question of what will happen when—not if—another major earthquake strikes this seismically cursed land. The latest plan by TEPCO, Japan's largest power provider, is to build a wall of frozen earth around the damaged reactors and other highly radioactive areas to prevent radiation from seeping out of the site. But even if this and other technological fixes succeed, the government estimates it will take at least 30 years to decommission Fukushima Daiichi and make the site safe from radiation.

Japan took all of its other 48 nuclear power plants off-line after Fukushima, but Prime Minister Shinzo Abe wants to restart some of them despite public opposition. Commissioned in 1971, Fukushima Daiichi should have been retired or retrofitted long before a 46-ft. (14 m) tsunami forced the issue. Touring the site, I'm struck by how much of the damage remains. It's not just the throbbing danger of the unseen nuclear-fuel rods. The carcasses of the reactors themselves are exposed in places like autopsied remains, stained from the soot of the hydrogen explosions that resulted from the meltdown. We walk into a building that housed the control room for Reactors 1 and 2, where a dozen workers, plunged into darkness by the power cut, labored by flashlight to try to achieve cold shutdown.

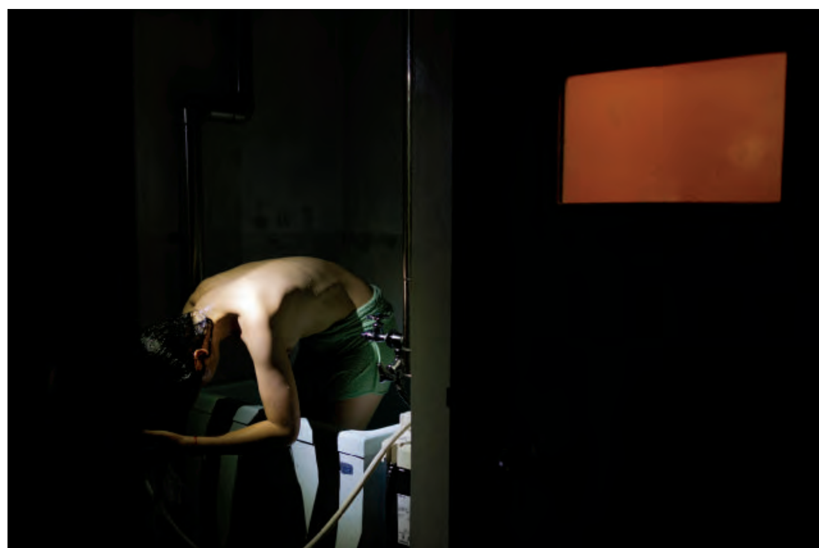
In the control room, amid the rows of screens and panels, calculations scrawled on metal by engineers represent the desperate graffiti of men who could not halt a nuclear meltdown. Electricity was not restored until March 24, nearly two weeks after the tsunami. "We have to honestly and deeply reflect on the accident," says Takafumi Anegawa, TEPCO's managing executive officer, whose role is to shake up a utility he has accused of cozy relations with regulators and a cavalier attitude toward safety. "We should reset the level we pursue to the very highest. If we cannot achieve that level because of our capability or our culture, it means we are not qualified." Akira Ono, the plant superintendent at Fukushima Daiichi, is equally blunt—at least in a Japanese context—about the need to reassess the nation's nuclear future. "Because of the accident," he says, "nuclear energy is an issue that should be discussed again in our country."

There's no question that Fukushima Daiichi is a huge test for TEPCO—and for Japan. Yet the destroyed plant feels enervated and empty, like a Hollywood version of a nuclear wasteland. Thousands of workers may be on the payroll, but few are in evidence. The protective suits slow everyone down, masking any sense of urgency. Just outside the destroyed reactors, in a swath of Fukushima declared uninhabitable for mankind, azaleas are in full bloom. A rabbit hops across the road—I wonder where, in this devastated landscape, it is going.

The Glow Is Off

IT'S A TRUISM, BUT THAT DOESN'T MAKE IT ANY LESS true: Japan is perhaps the world's most collectivist society. But what happens when that collective trust is so fundamentally breached? Fukushima was not just an epic natural disaster in a nation long conditioned to frequent betrayals by land and sea. It was also a man-made crisis, born of political hubris, corporate dereliction and an instinct to obscure Japan's ugliest elements that remains unchanged to this day. The Japanese, as a people, may bow before the temple of precision, fetishizing detail and safety. But Fukushima proved that no matter how many cool innovations Japanese companies churn out, a lack of oversight and emergency initiative can be deadly.

You'd think, for example, that a nation ranking as one of the world's most seismically active would take heed when building a nuclear plant on the edge of the



Lasting tragedy
Clockwise from top left: Japanese forces search for tsunami victims in 2011; a hospital in Okuma, not far from the crippled plant, in 2012; a segment of the tsunami-pounded coastline in 2011; Yaeko Watanabe, whose husband worked at the Fukushima plant after the accident and died of cancer in 2012; a 2014 memorial service; a resident of Koriyama, about 35 miles (56 km) from Fukushima, so worried about radiation exposure that she keeps a Geiger counter in her home

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NUCLEAR REACTORS IDLED
Despite public opposition, Prime Minister Shinzo Abe wants to restart some of the shuttered plants

Pacific Ocean. Yet TEPCO's disaster plan and postaccident coordination were woeful. It had ignored a joint government and utility-company study on potential inundation by a tsunami. TEPCO's advisory ranks were weighed down with too many retired officials. But the fault went well beyond one power company. The Nuclear Accident Independent Investigation Commission, authorized by Japan's parliament, was damning in its 2012 report on the nuclear meltdown: "What must be admitted—very painfully—is that this was a disaster 'Made in Japan.' Its fundamental causes are to be found in the ingrained conventions of Japanese culture: our reflexive obedience; our reluctance to question authority; our devotion to 'sticking with the program'; our groupism; and our insularity." The panel, composed of Japanese scientists, doctors and engineers, among others, continued with a candor exceptional for Japan: "The consequences of negligence at Fukushima stand out as catastrophic, but the mind-set that supported it can be found across Japan."

Yet the hope that Japan's nuclear crisis would spark a national reset has gone unfulfilled. The disasters of 3/11 caused the largest single loss of life on Japanese soil since the U.S. detonated atomic bombs over Hiroshima and Nagasaki. But Japan was reborn after that catastrophe nearly 70 years ago, rising from the ashes of defeat and building, in just a few decades, an economic powerhouse that would eventually draw a third of its energy from nuclear power. This time around, though, the phoenix never emerged. Public faith in the government's ability to ensure safety and respond to crises has eroded because of the nuclear accident, but Fukushima has not inspired new environmental or civil-society movements that can boast of major accomplishments. "Inertia is still very strong," says Akihiro Sawa, an executive senior fellow at the Keidanren business federation's 21st Century Public Policy Institute.

In the meantime, Fukushima's fallout continues to claim victims. Nearly 20,000 people—mostly in Iwate and Miyagi prefectures but also in Fukushima prefecture—were killed by the earthquake and tsunami. Yet only in Fukushima, the epicenter of the nuclear catastrophe, does the number of people who the Japanese government says have since died from causes indirectly linked to the natural disaster now exceed the initial death toll. Stress, both physical and mental, has led to a rise in suicides.

About 125,000 Fukushima residents, most of whom used to reside within an 18-mile (30 km) radius of the nuclear station, still exist as evacuees because their homes are within a government-mandated exclusion zone. Some now subsist in prefab units more evocative of a third-world disaster zone than the world's third largest economy. In June the Ministry of Environment admitted that decontamination efforts in some towns near the stricken plant had failed; residents cannot return, even if they want to. Fear has infected other neighborhoods as parents wonder whether the radiation clouds that spewed out of the ruined reactors in the days following the tsunami harmed their children. At the disabled plant itself, many experienced employees have reached the official limit on maximum dosages of radiation—leaving critical work in less skilled hands.

Despite all this, the Japanese government's message to the world is, Trust us. Last year Prime Minister Abe visited Fukushima, flashed a grin and bit into a locally grown peach to prove that the area's produce—an economic mainstay—was safe to eat. Shortly after his fruit tasting, Abe traveled to Buenos Aires and gave a speech that propelled Tokyo to victory as the host of the 2020 Summer Olympics. "Let me assure you the situation is under control," he said. But is it? "This was a grave accident in which many mistakes were made," says Haruo Kurasawa, one of Japan's foremost TV commentators on nuclear issues. "But no one has gone to jail, and no one wants to take responsibility. Everyone still wants to look the other way. Nothing has really changed."

Hot Zone

THE ROAD TO THE FUKUSHIMA DAIICHI PLANT IS LINED with scenes of small-town Japan: a noodle eatery with chopsticks and condiments on the counter, farmhouses with shingled roofs, even a loader with a claw hanging in midair. Billboards boast of diners, bowling alleys and hot-spring resorts. But no one lives here. The area began to be abandoned on March 12, 2011, when the first of the reactors exploded and left entire towns preserved in radioactive amber.

Yukie lived in Futaba, a tidy town where many residents worked at the nearby nuclear plant. Other parts of rural Japan have been slowly depopulating as society has grayed and the young have flocked to the big cities. But Futaba survived because of atomic power. Fukushima Daiichi's history is intertwined with Yukie's family lore: her grandmother grew up on farmland that was given up for the future site of the nuclear plant, and Yukie entered an arranged marriage with a nuclear worker. (Her husband still works at the plant, which is why she doesn't want her full name used.) "We were a TEPCO family," she says. After the evacuation order went out, Yukie and her family ran home—just under 2 miles (3.2 km) from Fukushima Daiichi—to grab a few essentials, like blankets and diapers for her

$35.4
BILLION
Estimated direct annual impact of the nuclear shutdown on Japan

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Marking time *Workers tend grass by hand at the Ikata Nuclear Power Station, which was idled because of Fukushima*

daughter. Then they piled into a car and drove northwest. Unbeknownst to them, the prevailing winds blew radiation along the very same path.

Since then, Yukie and her family have moved 10 times, from one set of cramped rooms to another. But the specter of radiation—invisible, odorless, tasteless—follows them. Yukie, 33, and her two small children now live like shut-ins on the outskirts of Iwaki, the biggest city near Fukushima Daiichi, about 25 miles (40 km) away. Earlier this year, her daughter broke out in mysterious rashes; one visiting doctor speculated that radiation could have caused the outbreaks. (Other doctors, however, blamed different causes.) Yukie suffers from frequent nosebleeds, which she says she never had before the disaster.

As yet there's no clear evidence of any connection between the Fukushima meltdown and ill health in the area, even among nuclear workers. The government has pointed out that taking an X-ray or even a long-haul flight can expose our bodies to surprisingly high doses of radiation, yet somehow we go about our lives without worrying about the risk. But even if the science says otherwise, the radiation from an accident like Fukushima feels different—and dangerous. "There's so much societal pressure to not even mention the word *radiation*," says Sachihiko Fuse, an oncologist who helps run a private medical clinic in Fukushima city. "The national and prefectural governments say, 'Please, there's no danger, live as normal.' But people are concerned."

There's no doubting the very real mental-health crisis caused by Fukushima—and no one knows exactly how stress can manifest itself in physical complaints, including nosebleeds. And sometimes the consequences are far worse. Many suicides aren't reported by families who worry about being stigmatized, say local doctors, obscuring the real death toll. Shigekiyo Kanno, 54, didn't hide his feelings. A dairy farmer from Soma who lost his livelihood because people feared his milk was radioactive, Kanno used his barn walls for his suicide note. "I've lost the will to try," he wrote, apologizing to his wife and sons before hanging himself from a rafter. "If only there was no nuclear plant." Kanno's death was not initially categorized as Fukushima-related.

Nuclear Politics

ATOMIC POWER IS ENTRENCHED IN THE JAPANESE GOVernment. In 2009 more than 70% of individual donations to the now ruling Liberal Democratic Party came from current or former electric-company executives. The LDP supports restarting Japan's nuclear power plants, which were idled by a previous government. Toshikazu Okuya, director of the energy supply and demand office at the Ministry of Economy, Trade and Industry, frames the need to restart the reactors as both environmental and economic in a land starved of domestic energy resources. Japan's greenhouse-gas emissions increased by 7% from 2010 to 2012 as imported fossil fuels replaced carbon-free nuclear. The government has estimated the direct impact of the nuclear shutdown to be $35.4 billion a year—this at a time when Abe is trying to revive the national economy. "We cannot say there is no risk," Okuya admits of nuclear power. But "we need to try to take back public confidence."

In Fukushima, that starts with mothers, an unlikely demographic that has become politically active and increasingly antinuclear. For months after the meltdown, Kayoko Hashimoto's daughter wore a dosimeter to school, just as authorities urged. The radiation cloud had passed over the region, but locals were told the area was safe. So why was her daughter's dosimeter recording high levels of radiation? Hashimoto bought a top-of-the-line dosimeter and began testing the route her daughter took to school. To her shock, she discovered tiny hot spots of radiation throughout the community: one by a bakery, another by a dog kennel, still another in the school parking lot. These levels were even higher than in some towns that had limited outdoor playtime because of fears over radiation exposure. The health effects of such small hot spots aren't clear, but Hashimoto is worried. "People are scared of radioactivity," she says, "but they don't want to make a fuss or draw attention to themselves."

Hashimoto has also campaigned against the storage of decontamination waste on school grounds. Piles of black plastic bags—filled with radiation-tainted topsoil and vegetation—are scattered across Fukushima. But no one wants a formal dumping ground near them. Even designating temporary storage sites for the bags is difficult, which is why schools have been used. The bags have a life span of a few years, and already some have grass and debris poking through. "It's wrong to call this decontamination," says nuclear analyst Kurasawa. "It's just moving around contaminated waste."

Some of the laborers in charge of that decontamination are poorly paid and trained; recruiters have even been known to target the homeless. At Fukushima Daiichi itself, three-quarters of the white-suited workers are subcontracted laborers. In March a contract worker died in an accident after it took an hour to get him to a hospital. "Before I was proud because I thought I was helping to save Japan," says Sunny, who uses a nickname because he still works at the plant and isn't supposed to speak out. "But it's long hours and bad pay. The new foot soldiers don't get any training, and the media say we're constantly screwing up. I've lost my pride."

For Kyoji Konnai, a tatami-mat maker and former nuclear-plant worker, radiation isn't a concern. In April the government formally lifted an evacuation order for Miyakoji, just over a mountain road from Fukushima Daiichi, after decontamination work was carried out. Konnai and about a third of other neighborhood residents have returned and cleared the mold, vermin and ruined furniture from their homes. "I still think the nuclear industry is important," he says. "Without it, we'd have no jobs in the area." But others cannot go home. On the outskirts of Iwaki, a grim collection of metal huts is the latest temporary housing offered to 250 Futaba families. Tatsuko Shiga, 77, has pots of flowers in front of her tiny living space. A shelf holds the family altar. But there's only so much you can do with a prefab shack. Still, Shiga has no wish to return to her farmhouse, one of the few in her community to have escaped the tsunami's wrath. "That place is finished," she says. "It's only fit for ghosts." —WITH REPORTING BY CHIE KOBAYASHI AND MAKIKO SEGAWA/FUKUSHIMA ■