

## Resilient Response and Recovery at Western Digital: After the Thai Flood<sup>1</sup>

As raging floodwater rushed through various broken spots along the dike at the Bang Pa-in (**BPI**) industrial estate, which is located approximately 40 miles north of Bangkok and 5 miles south of Ayutthaya in the Chao Phraya River basin, the BPI estate flood-fighting team had to retreat for their own safety on October 15, 2011. Throughout the night, heavy rain continued to fall and strong floodwater kept rising. All factories within the BPI estate became flooded.

At daybreak on October 16, Joe Bunya (SVP, Hard Disk Operations Asia, **WD (a Western Digital company)**) and his management team toured their inundated hard disk drive (HDD) factory at the BPI estate (BPI plant in short) on a boat. Their hearts sank as they saw that certain critical equipment (some weighing more than 5 tons) for producing sliders located on the ground floor was completely submerged under 6 feet of corrosive floodwater.<sup>2</sup> Recognizing that the entire factory was contaminated and that critical equipment on the ground floor could not be replaced for many months, Joe and his management team felt the immediate need to save their factory.



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<sup>1</sup> This case is jointly prepared by Mr. Joe Bunya (Senior Vice President, Hard Drive Operations Asia, WD (a Western Digital company)), and Christopher Tang (Edward Carter Professor of Business Administration at UCLA Anderson School of Management). This case is intended for MBA class discussion. ©UCLA Anderson School of Management, 2013.

<sup>2</sup> The slider is the body of material that supports the actual drive head in a hard disk. The slider slides over the surface of the disk, carrying the head at a consistent height above the disk for reading and writing.

As a way to keep customers and investors informed of the situation, Western Digital Corporation (issued the following press release on October 17: “WDC today announced that it has extended the suspension of its operations in Thailand. Over the weekend, rising water penetrated the Bang Pa-in Industrial Park flood defenses, inundating the company's manufacturing facilities there and submerging some equipment..... All WD employees in Thailand remain safe.” At the same time, the popular press (Wall Street Journal, New York Times, Computerworld, etc.) speculated that it would take multiple quarters for WD to restore its operations in Thailand.<sup>3</sup>

With a resilient response and recovery and the perseverance of all WD employees in Thailand, President and CEO John Coyne officially re-opened the plant at BPI on November 30, 2011 – only 46 days after its closure. Coyne remarked that, “While much work remains to be done over the next several quarters to reach our pre-flood manufacturing capabilities, the progress thus far is significantly ahead of our original expectations and is a tribute to the dedicated and effective actions of our employees, contractors and Thai government agencies, the efforts of our supply partners and the support of our customers.”<sup>4</sup>

On January 13, 2012, the BPI plant produced the first slider unit after the flood, exceeding internal and external expectations. Sampan Silapanad (VP, Magnetic Head Operations) attributed this speedy recovery (one week ahead of WD’s internal schedule) in his remark: “The recovery has proven that WD employees have exceptional passion and perseverance. We did everything to make the plant equal or better than the pre-flood condition.”<sup>5</sup>



<sup>3</sup> See [http://www.techcycle3.com/files/Thailand\\_flooding\\_impact\\_on\\_HDD\\_supplies\\_12aNov2011\\_2\\_.pdf](http://www.techcycle3.com/files/Thailand_flooding_impact_on_HDD_supplies_12aNov2011_2_.pdf) for a compilation of various commentaries from the press.

<sup>4</sup> Source: “Western Digital: Flood Response and Recovery,” Journal of the American Chamber of Commerce in Thailand, Vol. 1, 2012.

<sup>5</sup> Source: Sabayjai, S., “WD credits staff for turnaround after floods,” The Nation, April 23, 2012.

## Thailand Floods in 2011

Thailand is prone to seasonal floods that tend to occur in the North and spread down the Chao Phraya River through the central plains. Over the years, the Thai government has developed various flood control systems such as dams, canals, drainage tunnels, etc. Unfortunately, rainfall over northern Thailand from March to July in 2011 was over 300% above the normal level. As the rate of incoming flow of rainwater was higher than the discharging rates at various dams in the northern part of Thailand, most dams were almost full by the beginning of October in 2011. As floodwaters were moving south along the Chao Phraya River, major cities such as Ayutthaya and Bangkok were facing an imminent flood.



Despite the efforts of the Thai government and various international organizations such as the United Nations, floodwaters inundated northern parts of the capital city of Bangkok. Flooding persisted in some areas until mid-January 2012, ultimately causing over 800 deaths and affecting over 13 million people. With 65 out of 77 provinces declared flood disaster zones, over 7,700 square miles of farmland was severely damaged. According to the Federation of Thai Industries, the estimated damage was at least 185 billion Baht (1 US\$ = 30 Thai Baht). This includes 95 billion Baht damage on Thai industry, 25 billion Baht damage on Thai agriculture, and 65 billion Baht damage on residential properties.

The flood in 2011 disrupted the supply chain operations in certain key industries in Thailand. Besides the fact that Thailand accounts for 30% of global trade in rice, over 40% of the world's hard disk drives were produced in Thailand and most of them were concentrated in the Bangkok-Ayutthaya corridor. Also, in addition to tourism, Thailand is a major automotive parts producer for many Japanese car companies such as Toyota and Honda, and a major producer for many Japanese digital camera companies such as Canon, Nikon, and Sony. As such, the 2011 flood in Thailand created major global supply chain disruptions in the automotive industry (due to a shortage of parts) and the computer industry (due to a shortage of hard disks). The World Bank

estimated 1.5 trillion Baht (US\$50 billion) in economic damages and losses due to the 2011 flood in Thailand.

## Western Digital in Thailand

As the market became saturated and highly competitive, various hard disk drive companies such as Hitachi, Maxtor, and Samsung were acquired by giants such as Western Digital and Seagate. After a series of mergers and acquisitions, there were only three key HDD companies left by the end of 2011 (Exhibit 1): Toshiba captures 15% of the market, and the rest of the market is equally divided between Western Digital and Seagate.

Headquartered in Irvine, California, Western Digital Corporation ([www.westerndigital.com](http://www.westerndigital.com)) is a global provider of hard disk drives, networking equipment and home entertainment products under the WD, HGST and G-Technology brands. Western Digital is the largest producer of HDDs in the world, with approximately US\$16 billion in annual revenue as of the third calendar quarter of 2012.

Through a series of foreign and domestic investments that began in the 1980s, Thailand became a major producer of hard disks by 2010. To achieve cost synergies (by reducing freight costs) and supply chain efficiency (shorter cycle time, better coordination, and lower inventory), Thailand has developed a cluster of industries associated with hard disk drives manufacturing. Specifically, this cluster includes hard disk component parts manufacturing (such as motors, suspensions, disk media, disk heads (sliders), etc.) as well as hard disk assembly operations.

To leverage skilled labor at low cost and to leverage the Thai government's tax incentives, WD established two HDD plants in Thailand (at the Bang Pa-in and Navanakorn industrial estates located in Ayutthaya Province and Pathum Thani Province, respectively) in 2003.<sup>6</sup> By the end of 2011, WD was employing over 38,000 people (including 2,000 engineers and scientists) and had become the largest foreign employer in Thailand. The country was producing 60% of all of WD's hard disks. The remaining 40% were produced in the other plant located in Kuala Lumpur, Malaysia. Because the BPI plant produced sliders (magnetic heads for reading and writing on the disk surface) for different types of HDDs for notebook PCs, desktop PCs, other consumer electronic products and external storage devices, the BPI plant inundation affected the production of most classes of HDDs. In addition to the closure of both plants in Thailand that performed hard disk assembly operations, there were serious concerns about shortages of various mechanical hard disk components because many of WD's parts suppliers in Thailand were inundated.<sup>7</sup>

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<sup>6</sup> Seagate's HDD plant located in Korat (northern part of Thailand) was not affected by the 2011 Thai flood.

<sup>7</sup> Source: Western Digital Updates --

<http://www.wdc.com/en/company/thailandupdates/ThailandFloods2011FAQ.pdf>

## Before the Flood – Identifying, Assessing, and Mitigating Risks

According to the *Centre for Research on the Epidemiology of Disasters* in Belgium ([www.emdat.be](http://www.emdat.be)), the number of floods in Asia has been growing at an exponential rate, as indicated by 1910-2010 statistics. Unlike earthquakes, floods are more predictable in terms of timing and location, and companies can develop plans for better preparedness and mitigation. Knowing Thailand to be flood-prone, WD has developed its Business Continuity Plan (BCP) to safeguard its employees and facilities (in addition to the plans developed by the Thai government and by the BPI estate).

While the BPI had built a dike to surround its 750-acre estate, WD's 7-acre BPI plant also had a designated BCP team that performed the following tasks before the flood:

1. *Monitor and assess risks.* Monitored the rain forecast, floodwater level, conditions of dams and dikes in surrounding regions and areas, and assessed the likelihood of the flood and the potential impact on the plant and WD's suppliers in Thailand.
2. *Proactive measures.* Prepared the plant against floodwater entering it, including sandbags, water pumps, generators, first-aid kits, and essential food. In addition, the team prepared evacuation plans that included the detailed mapping of bus routes.
3. *Mitigation plans.* Developed mitigation and contingency plans by moving inventories and some equipment from the ground floor to higher floors to avoid potential damage from floodwaters.<sup>8</sup> In addition, the team worked with management in Thailand, Malaysia, and the United States to develop contingency plans in case production at the BPI plant was disrupted. Specifically, WD prepared a plan to shift much of its production to Malaysia should the BPI plant shut down.
4. *Communication plans.* Develop communication plans with all employees, all key suppliers, and all other WD units throughout the company.

## During the Flood – Resilient Response

As the BCP team continued to monitor the flood situation, they found that the information obtained from various sources, including government authorities, appeared to be inconsistent.<sup>9</sup> At the same time, after the estate flood-fighting team's unsuccessful efforts in repairing various breaks (including a 60-foot-long one) at the dike surrounding the BPI estate, strong floodwater was gushing through various places and entering the BPI plant. Despite piles of sandbags and

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<sup>8</sup> WD was unable to move some of the heavy equipment (weighing more than 5 tons) to higher floors.

<sup>9</sup> Despite the Thai government's efforts in establishing the *Emergency Operations Center for Flood, Storm and Landslide* in August 2012 that was intended to coordinate warning and relief efforts, the government has been criticized for giving mixed or conflicting information. Some foreign companies also thought there was a lack of accurate and timely information provided in English, preventing them from being better prepared. Prime Minister Yingluck Shinawatra immediately responded to the press that the Thai government will invest in water management to ensure that such flooding does not happen again (source: cnc.com).

water pumps, the floodwater continued to rise. To ensure safety, all WD employees were asked to evacuate the facility and a security team was appointed immediately to secure the company's property.

At the same time, the WD management team assembled at Sofitel Hotel in Bangkok and deployed various contingency plans. These included:

- *Ensuring employees' safety and well-being.* To ensure employees' safety, strict safety standards and protocols were enforced by a dedicated EHS (Environment, Health and Safety) team. Before starting any work, the team got together and planned the process with safety as the number one priority. During the cleanup, workers were required to wear U.S. industry-standard protective gear. The EHS team would perform frequent audits to ensure strict compliance to the agreed upon process. Every employee and worker was urged to take the safety issue seriously. Even though both plants in Thailand were closed, the WD management team did not want to overburden employees' livelihood, especially when their homes were also flooded. So to build trust and loyalty, WD decided to keep all 38,000 employees on the payroll at 75% pay during the recovery period.<sup>10</sup>
- *Minimizing supply chain disruption.* Knowing that WD's customers typically had about two weeks of inventory on hand and distributors had about a four-week supply, WD decided to reduce the impact on its customers by shifting production from Thailand to Malaysia during the recovery period. To accomplish this, WD immediately ramped up the Malaysian facilities to full capacity.<sup>11</sup>
- *Reducing recovery time by saving submerged equipment.* Recognizing that some critical and heavy equipment was in 6-foot-deep floodwater and understanding that this equipment could not be replaced quickly and cheaply, WD managed to get divers to retrieve that submerged equipment. However, because the equipment was extremely heavy, these divers had to unbolt the submerged machinery, disassemble it into different pieces (kits) under water, and then move the kits to higher floors.<sup>12</sup>
- *Maintaining consistent communication.* WD developed a plan to communicate information in a consistent and timely manner to all employees, all key suppliers, and all WD units. A temporary small command center was initially set up at the Sofitel Hotel in Bangkok, which was unaffected by the flood at the beginning. Later on, with support from one of WD's business partners, Siam Commercial Bank (SCB), WD moved its command center to SCB's central office in Bangkok. This was the location where the information from the frontline people at the flood site was received and communicated to headquarters on a daily basis. Management also visited the site every few days to get firsthand information and to provide support to the ground troops as needed. SMS messaging was used as a means to keep the entire workforce informed of the recovery progress. Also, WD headquarters in Irvine issued updated news on its website to ensure that customers and investors were fully informed of the situation.

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<sup>10</sup> Sabayjai, S., "WD credits staff for turnaround after floods," The Nation, April 23, 2012.

<sup>11</sup> Source: TechCentral, "WD shifts operations to Malaysia in wake of Thai floods," October 25, 2011.

<sup>12</sup> Source: Romero, J., "The Lessons of Thailand's Flood," November 2012, Spectrum, IEEE.



### **After the Flood – Speedy Recovery**

To restore the inundated factory at the BPI estate and resume manufacturing operations as soon as possible, the temporary office at the SCB headquarters building in Bangkok was also used as a command center to manage the recovery operations in parallel. At the same time, all key employees commuted to work during the recovery period, even though their homes were flooded. Immediately after the flood receded at the BPI estate, WD began recovery operations, which involved:

- *Establishing a decontamination process.* After the floodwater was removed, WD started the decontamination process by spraying the entire interior of the facility with special, non-hazardous chemicals to remove films of dirt, mildew, mold, grime, etc., from the ceilings, walls, and air ducts prior to the demolition work.
- *Restoration.* Besides restoring the main power, WD assessed those kits retrieved by the divers earlier. By reassembling the kits to rebuild various refurbished machines, WD managed to salvage 80% of the equipment.
- *Monitoring progress.* SCB provided WD with computer hardware, phone lines, and access to the Internet, albeit with limited bandwidth. WD's IT department established a line of communication with Corporate using "live meeting." The command center received daily, verbal reports from the frontline people at the sites and was able to keep Corporate informed of progress and the recovery plan.
- *Coordination and communication.* WD worked with its suppliers to ramp up production in Malaysia to reduce the impact on customers. Besides continued communication with different stakeholders, WD hosted a four-day seminar for over 20,000 employees at Thammasat University (Rangsit campus) in Thailand to ensure that WD employees received updates and the company's recovery plans.



## The Sun Shines Again

Strong leadership and well-executed contingency and recovery plans helped WD's BPI plant to be re-opened by President and CEO Coyne on November 30 just 46 days after the plant closure. That was weeks ahead of the internal schedule. This speedy recovery can be seen as phenomenal, especially when considering that many companies, including Honda, took 6 months to recover. To recognize the resilient response and speedy recovery at the BPI plant, all 2,500 WD Presidential Awards in 2011 were given to various WD employees in Thailand.

WD's production capacity had been affected significantly at the end of 2011. As reported in IHS iSuppli Research in February 2012, WD shipped 28.5 million HDDs in the fourth quarter of 2011, which was about half of the 52.2 million HDDs it shipped in the same quarter the year before. As such, WD slipped to the number two spot after Seagate at the end of 2011. Even though WD reported that the flood in 2011 cost the company US\$199 million, WD managed to restart its slider production in January 23, 2012.

While investors were concerned about the earnings of WD, their concerns were lifted when the price of HDDs continued to rise as the supply of HDDs fell in 2011. The underlying reason was that, even though Seagate's factory in Thailand was not affected, there was a shortage in the supply of the components for hard disk manufacturing because many hard disk components suppliers in Thailand were also flooded. As a result, there was a 29% reduction in the number of HDDs produced in Thailand in the fourth quarter of 2011. As the supply of HDDs fell, the average HDD price increased from US\$51 to US\$66: a 30% increase in the same quarter. As reported by IHS iSuppli in June 2012, the price of HDDs will remain high until 2014.



WD recovered faster than industry analysts expected. By the end September 2012, WD’s operations in Thailand were restored to the pre-flood level. This great news has major potential effects. Firstly, shipments would increase as more customers have stronger confidence in WD. Secondly, as the selling price of HDDs is “sticky,” WD’s revenue and profit would continue to rise. Moreover, in the second quarter of 2012, WD had completed the acquisition of Hitachi’s hard disk division. WD also set a new record by shipping more than 71 million HDDs with over US\$4.8 billion in revenue and earned a record profit of US\$745 million (Exhibit 2). Furthermore, as investors regained confidence about WD, the company’s stock price bounced back to the pre-flood level despite drops in stock prices during the flood period.



After suffering from serious flood damage in Thailand in October 2011, it is remarkable that WD reclaimed the number one spot in the HDD market by the end of the second quarter of 2012.

Upon reflection, WD's SVP Bunya remarked: *"The resilient response and speedy recovery at the WD plant in Thailand is a strong reflection of the core values formed and nurtured by President and CEO John Coyne: Passion, Action, Productivity, Perseverance, Innovation, Integrity and Teamwork – PAPP II TWO (Together We Outperform). These values were the foundation of WD's successful recovery from the 2011 flood."*<sup>13</sup>

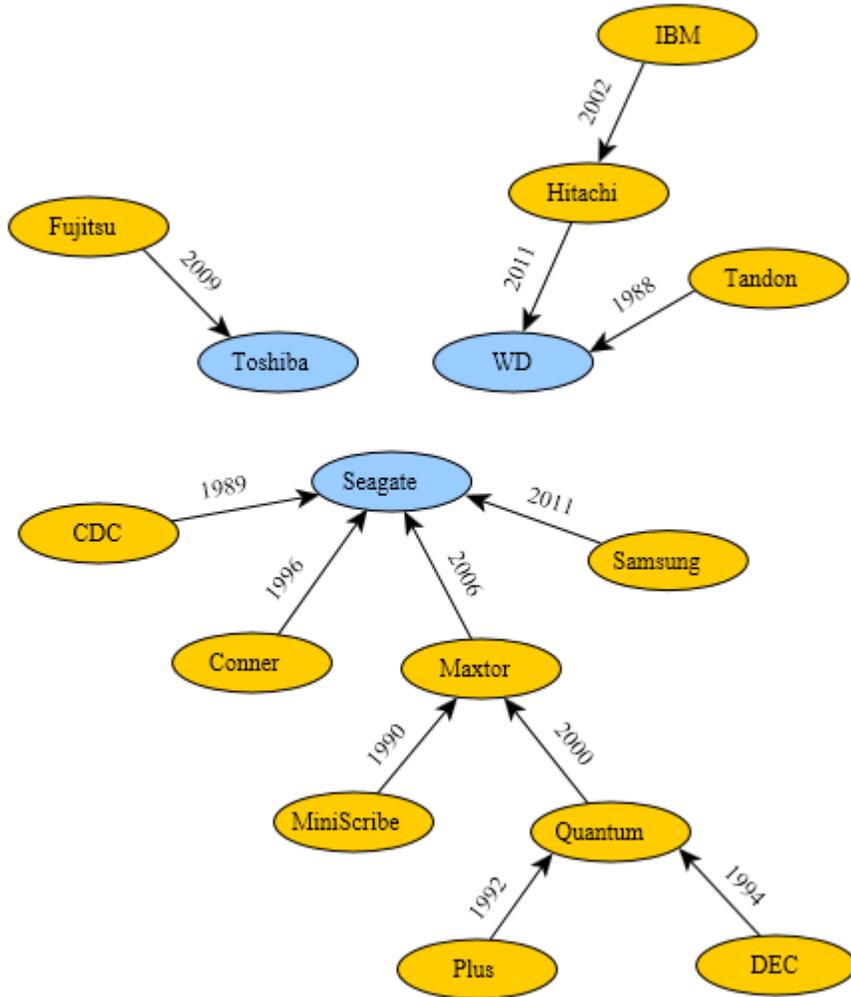
Looking ahead, WD is wondering about the following issues:

1. While the response and recovery were successful in fighting the flood, is there something WD can do to improve its Business Continuity Plan?
2. Should WD rely only on the Thai government and the BPI estate to control flooding? If no, then what shall WD do?
3. Knowing that Thailand is prone to floods, should WD consider shifting its production elsewhere?

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<sup>13</sup> Source: "Western Digital: Flood Response and Recovery," Journal of the American Chamber of Commerce in Thailand, Vol. 1, 2012.

**Exhibit 1. Recent mergers and acquisitions in the HDD industry.**



**Exhibit 2. Income Statement of WDC (as of September 2012)**

Currency in Millions of US Dollars	As of:	Dec 30 2011	Mar 30 2012	Jun 29 2012	Sep 28 2012	4 Quarter Trend
Revenues		1,995.0	3,035.0	4,754.0	4,035.0	
<b>TOTAL REVENUES</b>		<b>1,995.0</b>	<b>3,035.0</b>	<b>4,754.0</b>	<b>4,035.0</b>	
Cost Of Goods Sold		1,347.0	2,058.0	3,282.0	2,842.0	
<b>GROSS PROFIT</b>		<b>648.0</b>	<b>977.0</b>	<b>1,472.0</b>	<b>1,193.0</b>	
Selling General & Admin Expenses, Total		85.0	122.0	150.0	179.0	
R&D Expenses		191.0	265.0	406.0	396.0	
<b>OTHER OPERATING EXPENSES, TOTAL</b>		<b>276.0</b>	<b>387.0</b>	<b>556.0</b>	<b>575.0</b>	
<b>OPERATING INCOME</b>		<b>372.0</b>	<b>590.0</b>	<b>916.0</b>	<b>618.0</b>	
Interest Expense		-2.0	-6.0	-13.0	-16.0	
Interest And Investment Income		3.0	3.0	3.0	2.0	
<b>NET INTEREST EXPENSE</b>		<b>1.0</b>	<b>-3.0</b>	<b>-10.0</b>	<b>-14.0</b>	
<b>EBT, EXCLUDING UNUSUAL ITEMS</b>		<b>373.0</b>	<b>587.0</b>	<b>906.0</b>	<b>604.0</b>	
Merger & Restructuring Charges		-14.0	-34.0	-101.0	-26.0	
Gain (Loss) On Sale Of Investments		--	--	4.0	--	
Other Unusual Items, Total		-199.0	-15.0	-7.0	--	
Legal Settlements		--	--	-7.0	--	
Other Unusual Items		-199.0	-15.0	0.0	--	
<b>EBT, INCLUDING UNUSUAL ITEMS</b>		<b>160.0</b>	<b>538.0</b>	<b>802.0</b>	<b>578.0</b>	
Income Tax Expense		15.0	55.0	57.0	59.0	
Earnings From Continuing Operations		145.0	483.0	745.0	519.0	
<b>NET INCOME</b>		<b>145.0</b>	<b>483.0</b>	<b>745.0</b>	<b>519.0</b>	
<b>NET INCOME TO COMMON INCLUDING EXTRA ITEMS</b>		<b>145.0</b>	<b>483.0</b>	<b>745.0</b>	<b>519.0</b>	
<b>NET INCOME TO COMMON EXCLUDING EXTRA ITEMS</b>		<b>145.0</b>	<b>483.0</b>	<b>745.0</b>	<b>519.0</b>	

Source: Investing Business Week Research, accessed December 2012.