



Photos courtesy chicagotribune.com

For ergo, it's what's inside that counts

*Proper assessments made Zurich North
America's new HQ work for its employees*

By Tim Pottorff

Head northwest out of Chicago and you will see the distinctive, glass façade of the custom-designed Zurich North America building, more horizontal than vertical, which rises just west of the Interstate 90 intersection with Interstate 290 in Schaumburg, Illinois.

The 783,800-square-foot icon has earned the LEED Platinum-certified designation for environmental design and sustainability. While that's all well and good, for the 3,000 employees who show up and work for eight or more hours a day, it's what's inside that counts – particularly at their workstations.

The 2016 move to Zurich's new headquarters showed how combining industrial engineering skills with ergonomics provides organizations – and their employees – a lot of value. Applied early enough, proper, initial specifications can keep you from buying equipment that has no chance of meeting your employees' needs. While that didn't happen here, as some things were done before trained ergonomists were brought in, industrial engineering tools and knowledge combined with ergonomic assessments resulted in adjustable workstations that were welcomed by management and employees. And the adjustability helped save money by reducing future ergonomics assessments.

Piloting the future

In June 2014, after many months of attempts to join the project, I was asked to review the design specifications for the furniture that was being considered for the new Zurich North America headquarters facility. Using the *ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations* technical standard as a guide helped me identify several opportunities to improve the furniture that ultimately was installed in the headquarters.

In this case – and in many instances – the pledge of ergonomic design by outside vendors fails to live up to its promises.

An internal ergonomist has your site's best interests in mind, and that was my job when I was brought onto the project team – provide hands-on, internal ergonomics consulting assistance. The pilot project from September 2014 to December 2014 involved 150 people from a cross-section of departments who rotated every three weeks into one of four "pilot" workstation layouts. This was definitely the largest single-site project I ever worked with internally.

The science of ergonomics maximizes the flexibility of workstations and tools. People shouldn't contort their bodies into awkward postures to use a desk-placed keyboard and mouse or hold their neck awkwardly to view improperly placed monitors. Instead, employees should be able to make simple equipment adjustments to achieve optimal work postures and improve their physical comfort and well-being. This premise is true whether in an office setting, as described here, or in an industrial or process setting.

Unfortunately, several pilot group workstations were not easy to adjust. In some, workers had to actually use tools to adjust the "articulating" monitor arms. Simple adjustments took about 10 minutes and forced employees not only to work with awkward postures but exposed them to high force exertion as they tried not to drop the dual monitors while adjusting their height.

I had to carry around a set of hex/Allen wrenches, which was particularly vexing when a manufacturer representative asked to borrow them to adjust his company's monitor arms. Years of experience in the IE/ergonomist world has taught that anything that requires a tool for adjustment really isn't adjustable. Yet, the manufacturer and dealer representatives "answer" to having to use a tool to adjust every monitor arm was to install a new monitor arm post with a plastic cap that, when removed, gave access to a wrench at every workstation to make the arm adjustable.

As a result, many employees in the pilot

were "frequent fliers" who requested numerous visits to adjust their workstations. Clearly, employees were not going to adjust these "adjustable" monitor arms.

And in one pilot neighborhood, the chairs had a molded plastic design that could catch the rear-pocket button in the "weave" of the chair. People who stood up, a necessary process, risked having their buttons ripped off. Ergonomists never would have approved of such a chair, so this was just another effect of excluding an internal ergonomics team from the project's initial stages.

The articulating keyboard/mouse trays were another issue. Our ergonomics team knew that easily adjustable workstations made employees, whether in a manufacturing or office environment, more comfortable. But these trays had cross-support bars on the undersides of the desk, along with a drop-down attachment, making the keyboard/mouse tray mounting brackets significantly lower than desired. Employees who frequently bumped their knees had many of the trays removed, eliminating a key aspect of adjustability. The pilot workstations were a mix of traditional, seated workstations and a few adjustable sit-stand workstations, which were a mix of sit-to-stand keyboard trays, counterbalanced desks (we never effectively achieved a safety and comfort level due to the difficulty in balancing the weight of the desks) and electric desks.

Figure 1 reviews cost estimates for "traditional" sedentary workstation assessments and includes a factor for added costs required to adjust monitor arms.

Anticipating the move to occur nearly two years in the future, we worked with the project team and various manufacturers to identify products that would be easier for our employees to use to achieve maximum comfort. So in a "hoteling" area of one of the pilot floors, I worked with additional vendors and had articulating keyboard/mouse trays with "short" mounting arms installed on the underside of the desk surfaces, along

FIGURE 1

Costs add up

This table totals up the estimated cost to review 3,000 sedentary workstations.

Task	Hours per assessment	Total hours required	Cost (estimated consulting rate \$175/hour)
Cost to adjust sedentary workstation	0.75	2,250	\$393,750
Added costs to adjust monitor arms with tools	0.2	600	\$105,000
Total costs	0.95	2,850	\$498,750

with honestly counterbalanced monitor arms. Once calibrated, these arms did not require any tools for adjustment.

‘That’s it. I’m in. Let’s do it!’

Once the pilot had been completed in late 2014, in early January 2015 I was asked to develop a justification for sit-stand workstations, given their popularity in the pilot. I reached out to colleagues Alicia Licata, Lance Perry and the company director of health, safety and environmental affairs for North America to form a virtual team. Our team began creating a justification to help senior executives decide whether to move forward with adjustable sit/stand workstations.

We also researched the health effects of more standing. This was difficult, as just a few short years ago little research was available. One resource was the book *Could You Stand to Lose?* by Mark Benden of Texas A&M University. All things remaining equal, Benden wrote, adults who stood an additional two and a half hours per day would burn calories equivalent to a 20-pound weight loss over a year’s time. When I presented that fact to senior executives, in one of the best displays of executive leadership I have ever witnessed, the COO jumped out of her chair and said, “That’s it. I’m in. Let’s do it!”

I did not have a chance to get to many of the other benefits, like how the flexible workspaces resulting from sit/stand workstations could save costs. By this time, I had gotten to know Benden

better, and we invited him to Illinois to present a subsequently unfunded research proposal to the executives to compare the use of the sit/stand desks to employees’ personal health data in a double-blind study.

Since then, Benden has asked us why Zurich North America gave us such a degree of flexibility. Our experience was that employees frequently needed workstation assessments and adjustments that required installing a new monitor arm, keyboard tray or sit/stand desk add-on. We believed that if desks had articulating keyboard trays and monitor arms and could adjust from 22 to 48.6 inches, employees would need little additional equipment or workstation accommodations going forward, eliminating those added steps and expenses.

The executives decided to move forward with electric sit-stand workstations, an announcement that led to applause at an employee town hall meeting the following month. The next phase, through 2015, included further research and discussions regarding specifications for workstation design. This included several meetings with the project team and external business partners, using an internal analytical process to help select the workstation manufacturer.

Speed dating of a different sort

An enjoyable part of the selection process was the opportunity to be the customer for a change and experience a type of “speed dating” furniture evaluation and manufacturer elimination

process at the Merchandise Mart in Chicago. This facility is one of the largest office-style buildings in the U.S. outside the new West Coast behemoths and the Pentagon. Our project team spent many hours listening to sales pitches in showroom after showroom.

Once the “winning” chair and desk manufacturer had been selected, I traveled to that company’s headquarters, and our project team met the CEO, toured some design facilities and participated in change management brainstorming sessions.

Another part of the procurement process was to help write equipment specifications. We were locked in to the desks and chairs through prior contracts and employee preference data collected during the pilot, but we wrote the specifications for the monitor arms and keyboard/mouse trays. Procurement is an important yet often neglected component of an industrial engineer’s toolbox. By writing very specific criteria, we were able to procure monitor arms that did not require tools to adjust and keyboard/mouse trays with a lateral slide capability that could easily install under electric sit-stand desks with a shorter mounting track.

We then began work on how to settle thousands of people into a brand-new workstation concept in a limited amount of time. In the summer of 2016, my regional manager helped us identify a team of risk engineers from our region, and the manufacturer and furniture dealer agreed to help with the

Two important tools

As detailed in the main story, moving 3,000 employees into Zurich North America's new headquarters building helped detail the virtues of two industrial engineering tools, one old (procurement) and one new (writing apps).

A couple of examples author Tim Pottorff cited from outside of the Zurich North America story drove the importance of those tools home. At one client, laboratory technicians were complaining of sore shoulders and arms while pipetting. It turns out that the pipettor tips were too long because the lab's procurement department had gotten "a better deal" on long pipettor tips versus the appropriate, shorter tips that were needed. Once procurement realized the issue, the ordering protocol was changed.

Practitioners also can build smartphone and tablet applications to collect assessment data in a more efficient manner. These applications allow engineers and ergonomists to practically automate sharing assessment data with clients. Pottorff also created a new application for the assessment protocol of a new ergonomics standard in California, and an added feature of this most recent application is the use of geotagging data to identify the specific location on a property where the assessment has been performed. Geotagging also has the added benefit of keeping those conducting assessments "geographically honest."

move. Licata and I also worked on an iPad application for data collection during the move, and we worked with the project team to fine-tune the ergonomics approach for the fall move.

The first step was to train about 160 department change champions on the new workstations' features and adjustments. During the September 2016 training, colleagues, business partners and I had about 25 minutes to teach the change champions the nuts and bolts of the new workstations and how to make adjustments. Unfortunately, by the time the move came around, most of the change champions had forgotten most of their learning, as ours was only a small part of a full day of training, orientation and walking around the huge facility. Following that effort, we conducted several webinars to calibrate additional risk engineers and business partners to prepare for the move.

The physical part of the move was only about one mile, but the logistics were enormous. Employees were to

move into the new building on three Mondays in three phases of about 700, 1,000, and 1,300 employees. The second phase was scheduled two weeks after the first phase, to allow for any potential glitches to be addressed, and the third phase was scheduled the Monday following the second phase.

I'm first!

While our ergonomics team did not have to move any boxes, files or furniture, it was a high-profile venture. The building, one of the largest custom-designed commercial real estate projects in North America, won architectural design awards. And we were working with employees at all levels of the organization from nearly every department. Our goal was to contact each person the first week of their respective move phase and teach as many people as possible how to use their new workstations.

Prior to the move, we scheduled a series of classroom sessions in the new building and posted them on the new



television monitors spread throughout the facility. We also scheduled lean process huddle meetings with departments that had adopted lean processes, posted homemade and manufacturer's custom "how-to" videos on our corporate intranet, and because we knew we needed hands-on assistance on the floors, calibrated our team of risk engineers and business partners on how to coach people to use their new chairs, desks, keyboard trays and monitor arms. My role was to coordinate these efforts, conduct special reviews for those needing immediate assistance or accommodations and liaise with the project lead and her team at daily afternoon project meetings.

On the first day of the first wave of the move, our team took turns conducting "sweeps" to assist on various floors as waves of employees settled into their new desks. Each morning we used a whiteboard chart to assign floors and tasks. Making job assignments this way allowed our team to gauge whether we would need help and allowed us to flex

FIGURE 2

Tasking each floor

Data helped the ergonomics project team divide up tasks per person and floor.

Name	Task	Task/floor assignments
Pottorff	"Specials" and C-suite	C-suite and "specials"
Browning	Training sessions	Training center
Wendel/Shaw	Sweeps	10
Salem/manufacturing representative	Sweeps	9
Woletz/Turner	Sweeps	8
Zoia/Browning	Sweeps	7

support up or down depending upon needs.

Even though everyone was given specific goals and expectations each day, some greatly exceeded productivity, and some did not achieve adequate levels of productivity, so staffing levels were adjusted to achieve maximum productivity.

On the first move day, I was asked to attend the North America CEO's Monday morning staff meeting. After a few questions and answers about the workstations and our approach, the COO who set the tone nearly two years earlier boldly announced "I'm first!" She wanted me to help with her workstation. I spent most of the day helping other executives and their assistants before attending the first of daily project status meetings, which included the project lead, facilities, IT and the furniture manufacturer's representative, among others.

You've reset my preset!

On the third morning of the first week, we started to get questions from departments about the presets being reset overnight. Each sit/stand desk had four presets on the controller, with the "set" button to the left of the presets.

According to the reports, per our instructions, employees would leave the desk at standing height at night so they

would start the next day in a standing posture. But the desks were at credenza height in the mornings, and the presets had been reset. I worked with one of the manufacturer's representatives, who was on-site and helping with the sweeps. We called the product designer, but as we spoke, I started to work through various potential scenarios with one of the controllers and developed a theory.

This situation was a huge issue for all involved. We had just installed 3,000 of these desks, something was wrong, it was the North American launch for this particular product, and millions of dollars were on the line, along with my professional reputation.

At the Wednesday afternoon project status meeting, the issue came up early, and I asked the representative of the cleaning subcontractor if his employees had been adjusting the desks during nightly cleaning. The direct response was "We didn't do it." I asked him to call his cleaning crew supervisor to ask their employees if they were doing anything while cleaning. We learned that the cleaning crews were lowering the desks to credenza height to be able to dust them each night, but that they were also cleaning the controllers with a left-to-right motion. This dovetailed with my initial theory over the changed presets, as enough pressure in a left-to-right motion would reset the presets. We

instructed the cleaning crews to stop cleaning the controllers and the problem never arose again.

For the sweeps, each of us used an iPad with our custom application to track employees by department, manager, location, issues addressed and items/adjustments needed. This data was then downloaded each night to Licata, who sorted it by department and sent summaries to the facilities department for furniture needs or to employees' managers for accessory needs. Figure 2 provides an example of the daily floor and task assignments made during the move.

Each "visit" started by first asking employees if they wanted assistance. Those who did were asked to back their chairs away from the desks (we learned early on that everyone was enamored of the electric desks like a child with a new toy). We taught them how to use the new chairs and find a comfortable, seated posture before moving toward the desk and teaching employees how to adjust the desk, set the presets and use the keyboard/mouse tray and monitor arms. I believe the flexibility of the workstations allowed many employees to adjust their workstations independently, saving the company hundreds of thousands of dollars in assessment costs.

One challenge in the C-Suite was that executives wanted it to look, well, executive. So although executive assis-

FIGURE 3

When adjustments equal cash

Installing adjustable workstations in Zurich North America's headquarters saved the company hundreds of thousands of dollars in ergonomics assessment costs.

Task	Hours per assessment	Total hours required	Cost (estimated consulting rate \$175/hour)
Sedentary workstation assessments	0.95	2,850 estimated hours	\$498,750
1,400 move-in assessments (new workstations)	0.25	350 used	\$61,250
Difference between 1,400 adjustable workstation assessments with monitor adjustments versus 3,000 sedentary workstation assessments	-0.70	2,500 hours (not used)	\$437,500 saved

tants received sit/stand desks, hardwood cabinetry surrounded the desk pedestals. This limited the desks to a lower range of only 29 inches. Moreover, the custom-built half-walls in front of their desks limited effective use of their articulating monitor arms. So these key employees did not have easily adjustable workstations.

The follow-ups for these workstations, which were effectively not adjustable, are excluded from Figure 3, which estimates how much adjustable workstations saved in assessment costs.

We learned during the move process that the early change champion training did not have the desired effect. The champions were exposed to too much information in a short time and forgot about it by October. They were effective, however, in helping us get their people to the classes and to wave us down if we had missed some of their employees during a sweep.

We learned that just placing the class schedules on the video monitors did not guarantee that anyone would show up. It was a new way of thinking, and only one person showed up for the first few classes. We realized our error, changed our approach, leveraged our relationships with the change champions, printed out class schedules and distributed them, and successfully filled classes during the remainder of the move.

By the end of the project we had reached 1,400 employees who wanted assistance, notwithstanding those few who were unhappy with the move and may have unconsciously made things difficult for our team because we “were the ones who had ‘done’ it.” We experienced extremes of “We’re so happy” to “We don’t like it.” We experienced many days where we logged more than 10,000 steps, where we were physically and emotionally drained, and where my manager mentioned one day, “You look exhausted.”

Later, during my annual performance review, he noted “You exhibited great leadership.” Probably the comment that meant the most to me was from the manufacturer’s representative, who had participated in scores of moves with many other companies. He remarked that our ergonomics effort made this the smoothest move he had ever witnessed.

Our team received special bronze and silver awards and bonuses. And in the ensuing months, not one workers’ compensation claim was reported by employees in the new facility. A job well done, but it required the investment of time, the use of intellectual capital and knowledge of the organization from working there 22½ years, the use of project management skills, along with the use of interpersonal and other communication skills to give the execu-

tives the data they needed to make informed decisions, and the ability to flex the number of consultants working on specific days.

To achieve the greatest chances of success, industrial engineers and ergonomists have to write our reports and justifications to match the metrics or other criteria executives are held accountable for. Sometimes we know those metrics going in, and sometimes we must cover all the bases ahead of time, just in case.

But no matter what we do in our lives, as industrial engineers we have unique skills that let us work at all levels of myriad organizations, whether in professional or volunteer roles. These are skills for which we as IEs should be thankful. ♦

Tim Pottoroff, founder and principal at QP3 ErgoSystems LLC, is a certified industrial ergonomist who earned his B.S. and M.S. degrees in industrial engineering from Kansas State University. He previously worked as a manufacturing engineer in defense electronics at Texas Instruments. He then started his ergonomics career at Alcoa’s largest smelter, Warrick Operations, later becoming a consulting ergonomist with Zurich Services Corp. He has authored various other articles and presented numerous topics at professional ergonomics and safety conferences, including IISE’s Applied Ergonomics Conference.