

## **Building LIFE: How to Get Craft Truly Engaged in Construction Projects**

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### **Introduction**

As a large international construction company, Turner Construction faces the ongoing challenge of continuous improvement for an already mature and advanced safety program. In order to help meet the continuous improvement challenge, Turner has teamed with Liberty Mutual and Predictive Solutions to develop the Building L.I.F.E.™ (Living Injury Free Everyday) process. The Building L.I.F.E.™ process has three goals or objectives:

1. Develop and deploy a repeatable safety problem-solving model with an upstream emphasis on risk and the systems which drive risk (connected to the safety pre-planning process).
2. Increase involvement, engagement and participation of the front-line workers in the daily safety process.
3. Increase the use of positive recognition and feedback at various levels on the construction project, to optimize performance of desired behaviors.

Building L.I.F.E.™ seeks to shift the emphasis away from top-down directives to bottom-up engagement. Building L.I.F.E.™ does this by obtaining significant involvement from the front-line workers in the safety process, and by using key elements of Behavior Based Safety processes. As Turner optimizes systems within Building L.I.F.E.™, they expect to see positive and measurable differences, from front-line workers bringing solutions that are more holistic and

sustainable, to more proactive leadership and engagement from subcontractors. Workers ultimately want to be part of Turner projects because it is safer, and that is a true-value proposition that creates sustainable results. Put another way, Building L.I.F.E.™ is a way of “doing safety” with and *for* front-line workers, rather than *to* them. The strategy for rolling out Building L.I.F.E.™ includes: 1) selecting a pilot Business Unit (Chicago), 2) establishing a steering team, 3) conducting a baseline Cultural Assessment and 4) choosing a pilot project to implement the Building L.I.F.E.™ process. This paper will review the elements involved in the Building L.I.F.E.™ process and preliminary results.

## **Historical Perspective – Safety Plateau**

Organizations have traditionally measured safety performance in terms of outcome measures like incidents, failures or costs, played out over time. Often, those organizations embark on a safety journey, beginning from a point of “crisis,” concern, or plateau. From this starting point, initiatives and programs are implemented to improve safety results. The most common initiatives include increasing compliance efforts, reviewing/rewriting safety policies and procedures, escalating disciplinary measures, assessing and/or implementing additional safety training, looking at safety staffing needs, and using safety audits/inspections. As those elements mature, outcome statistics improve and additional initiatives and programs are implemented. These more advanced initiatives may include construction safety pre-planning, supervisory leadership development, and formalized performance management reviews. Again, outcomes improve over time.

At some point, improvement in these traditional safety outcome statistics slows and the organization experiences a general “plateau effect”. For many organizations, a common response is to “turn up the volume” on program elements that have worked well in the past (increasing disciplinary measures, hiring more safety people or intensifying the audit process). However, this often has little effect on speeding the pace of continuous improvement. Many effective organizations have experienced at least the beginnings of this “plateau effect”. For many others, it may be just around the corner. Organizations that recognize this early know that the only way to break below the plateau is to begin to intentionally do things differently, beginning with steadily increasing worker involvement and ownership.

Either case begs the same response: build upon the program elements which have realized reduction in incidents and explore new ways to reduce risk. For the next evolution of the “safety journey,” the key to improvement relies on increasing involvement of those closest to the risk: the front-line workers. This was one of the central objectives in developing the Building L.I.F.E.™ process: front-line engagement, involvement and ownership built on a multi-foundational model of safety performance that treats risk reduction and thus injury reduction within the context of the whole organization, including its systems, culture, and leadership.

## **Process Control (Upstream) vs. Damage Control (Downstream)**

All organizations have a finite amount of “safety energy” to invest. While it is very important to learn from our history and not forsake *damage control* in the management of incidents, harm and costs, there must be increasing investment in *process control*. Shifting focus and energy on reducing process failures as a result of risk from system variance increases reliability, drives out

uncertainty and prevents incidents. One of the foundational goals of the Building L.I.F.E.™ process was to facilitate this upstream movement by implementing a safety model which examines workplace risk, and the system elements which may contribute to it. The nature of risk in systems was an essential component folded into the first Building L.I.F.E.™ Program objective.

## Building L.I.F.E.™ Foundation – Safety Cultural Assessment

At the very heart of the Building L.I.F.E.™ process is a complete and transparent view of the overall safety culture. Every decision made, at every level of the business, sets the culture and ultimately what people see as important. Without this you cannot measure improvement over baseline. To ensure success and facilitate implementation, a safety Cultural Assessment was conducted with a representative sample of the target business unit staff. By starting with a cultural assessment, the BL team was able to identify potential barriers in effectively implementing a culture change strategy like the BL Process. In addition to identifying barriers, the cultural assessment also helps identify other weaknesses in our safety processes. This can be envisioned as progressive layers of barriers or defenses that organizations put in place to prevent defect, property damage, human error, risk, or injury. An example of one such barrier would be an organization’s policy and procedures, followed by behavior-based safety observations, followed by safety management systems (see Reason, 1990 for more on safety barriers). Each of these barriers has inherent weaknesses (active and latent) that place cracks or holes in these defenses (see graphic below). These holes present an opportunity for risk, error or injury. However, because there are typically many layers or barriers in place to prevent incidents, it is only when all the holes line up that there is a greater probability that an incident will occur. Over the past few decades, safety professionals, engineers, and workers have been effective at identifying when and where a new safety “barrier” is needed. Then organizations design, manufacture, and



implement the new barrier to prevent future incidents or reduce the consequences of an incident if it were to occur. However, the workers’ perspective is that the safety department is just adding “one more safety rule to make my job more difficult” or they are “wrapping us up in a cocoon of PPE to try to keep us safe.” In many instances, a new process, rule, requirement, or task is added to the safety system without first looking at the existing barriers for deficiencies. Thus, it is critical that

organizations use methods, such as intermittent cultural assessments, to identify “holes” in their safety systems and redesign the circumstances that place workers in situations that create risk, are error-likely, produce property damage, create defects or encourage risky behavior (Rasmussen, 2003).

## Building L.I.F.E.™ Element #1 – Repeatable Upstream Model

Safety Pre-Planning is one of the most effective elements in any construction safety program. Turner Construction requires all contractors to submit Job Hazard Analyses (JHA) ahead of pre-mobilization meetings as a means to pre-plan for safety. These JHAs follow the standard (three Columns) format of Steps, Hazards and Controls. Building L.I.F.E.™ adds to that step by creating a Job Hazard Risk Assessment (JHRA) in exchange for the JHA. Contractors still complete the standard format (Steps, Hazards and Controls), but when the pre-mobilization meeting takes place, a structured discussion takes place. This repeatable upstream safety problem solving model follows four steps: 1) Risk Assessment, 2) System Analysis, 3) Integrated Solutions and 4) Performance Measurement.

**1) Risk Assessment – Identifying the Risk.** During the pre-mobilization meeting, the contractor’s JHRA is reviewed and potential risks are discussed. This discussion starts with an informal dialogue of perceived risk in the work sequence, which results in a quantified Risk Assessment for those activities agreed upon for focus. However, not all work activities result in a quantified Risk Assessment. The Risk assessment is quantified using a comparative (1-5) scale for three interacting elements: 1) Frequency – how often the activity is performed, 2) Likelihood – how effective are the planned controls, and 3) Severity – what is the most severe plausible outcome. Understanding the nature and resulting effect of risk in the workplace is essential to continuous safety improvement. (Tolbert, 2005).

**2) System Analysis – Understanding the Risk.** Once risk in the work sequence is identified, the current or planned controls are examined to provide an understanding of the risk. This determination is made by viewing the workplace as a system; looking for gaps or variance between actual and “ideal” within the following System Elements:

- Environment – How does the physical environment impact risk? Consider physical tools, equipment, materials, protective equipment and configuration of the work space. Also includes time, temperature, indoors or outdoors, etc.
- Capability – Does the worker have the capability to identify the risk and mitigate it? – Consider training, orientation, procedures, hazard analyses, worker placement, skill sets or qualifications, language or literacy barriers, etc.
- Motivation – Are there any elements impacting the workers’ motivation. Consider performance or other behavioral aspects of the task including the clear behavioral expectations, the establishment of a performance baseline, the identification of barriers to “safe” behavior (schedule, etc.).

**3) Integrated Solutions – Reducing the Risk.** Once the risk is identified and the system factors are understood, risk reduction strategies can be developed. Organizations achieving optimal safety performance do so through the successful integration of safety solutions in the same three System Elements as above:

- Environment – System gaps lead to engineering solutions.
- Capability – System gaps lead to training, procedural, hazard analysis, and worker placement solutions.
- Motivation – System gaps lead to behavioral solutions through consequence management.

**4) Performance Measurement – Demonstrating Value.** With the integrated solutions in place, the impact of those modifications can be measured. First, a reduction in the risk score can be calculated on the JHRA form (for those activities scored in the Risk Assessment step). Additional measures can be identified and progress tracked. A good example would be percent Safe for each of the identified behavioral expectations. Last but not least, operational gains or efficiencies should be identified during this discussion and connected to the safety improvement.

The above four step process is built into the JHRA tool, which is then used in a Turner facilitated discussion during the construction pre-mobilization meeting. As the project moves closer to mobilization, the JHRA (with the needed adjustments completed) is reviewed with the actual crew performing the work. This is the critical step that connects the first objective (upstream model) to the second (front-line involvement and engagement). Without this review step, true engagement may never be realized.

## **Building L.I.F.E.™ Element #2 – Front-line Engagement**

The second goal in the Building L.I.F.E.™ process was to increase front-line involvement, participation, engagement and ownership of the safety process. Several opportunities for this were created, but will vary among different projects. This is where creativity is applied by the contractor to continuously look for, and present opportunities for, involvement of the front-line workers. If front-line workers see tangible opportunities for participation in the project safety program turned in to action, they will feel more “part of the team”. This is the ultimate goal for the Building L.I.F.E.™ process. Some examples of the opportunities developed on the Building L.I.F.E.™ pilot project were:

JHRA Reviews – as described prior, the JHRA connects the pre-planning process to upstream risk based safety. Since front-line workers will not usually attend these pre-planning meetings, a step was added to review the completed JHRA with the work crews as soon as possible after mobilization. This creates the opportunity to modify or update the plan to better reflect actual conditions as the work begins. The effect of this step is to expand involvement in the planning process to include the actual crew and get their opinions on where there is additional risk based on prior knowledge and experience.

Daily Take 5 Meetings – Daily Take-5 meetings provide an opportunity, every day, for all workers to help identify and discuss risk on a pre-shift basis (much like Pre-Job Briefings). The Building L.I.F.E.™ process takes this essential component of any performance management effort to another level by creating a *daily* opportunity to have a repeated, structured discussions,

lead by the contractor Foreman, that address:

- What are the main activities or tasks being performed that day?
- What are the key risks associated with those activities?
- What controls are in place to keep that risk low? (Environment, Capability, Motivation)
- What additional controls are needed to reduce that risk? (Engineering, Training, Behavior)
- At the end of the day, what went as planned and what didn't go as planned? If it didn't go as planned, how do we further reduce the risk in the system?

5-Worker Lunches – Once per month a small group of workers are brought together for a (contractor provided) lunch discussion held with the project leadership. This creates yet another opportunity for structured discussion with craft in which they can communicate and make suggestions on the identification and reduction of risk. Implementing those suggestions creates buy in, ownership and value for all workers involved. Recognition is then given to those workers who were instrumental in the identification and reduction of risk.

Regular Progress Meetings – In order to help integrate discussion of risk in, and on equal footing with, all operational issues, every regular project operational meeting includes it as an agenda item.

## **Building L.I.F.E.™ Element #3 – Feedback & Reinforcement**

One of the core goals of Building L.I.F.E.™ was to increase the level of positive feedback and reinforcement as a means to help establish and build effective work habits. To begin this element of Building L.I.F.E.™, Turner worked with Liberty Mutual and Predictive Solutions to identify a set of common safety related behaviors, resulting in an on-line tracking of Building L.I.F.E.™. This tool creates the ability for supervision to “warehouse” the Building L.I.F.E.™ activities performed, and observations made. It should be noted that some behavior safety processes rely heavily on direct peer to peer observations. Initially, the Building L.I.F.E.™ behavioral data was gathered by Turner personnel, but eventually will be expanded to allow contractors to gather observations on their own workers.

### **Building L.I.F.E.™ – Training Requirements**

In order to support the Building L.I.F.E.™ process, several levels of training were needed and developed. The time requirements associated with this training (especially on the project) were identified and folded in to the contract documents “up front”. Some of the Building L.I.F.E.™ training requirements were:

- Business Unit – Executive Kick off & Overview – 1 hour.
- Building L.I.F.E.™ project team – 8 hours training included the upstream model, and behavioral safety.

- Contractors – 2 hours to include JHRA and basics of behavioral safety.

## **Building L.I.F.E.™ - Measures & Metrics**

As with any program, Building L.I.F.E.™ will only be as successful as our ability to demonstrate value, not just from a safety standpoint, but operationally as well. Since the Building L.I.F.E.™ process focus on upstream measures ahead of incidents, the metrics are more designed to capture activities, rather than results or outcomes. The following are examples of the Building L.I.F.E.™ upstream measures:

- Percent Building L.I.F.E.™ engagement – measures the percentage of the workforce engaged in any BL activity.
- JHRA Penetration – measures the percentage of contractors on site with JHRAs (scored risk).
- JHRA Follow Through – measures the implementation of the (front-line) suggestions.
- Behavioral Project Score – measures percent safe behavior improvements (to baseline) over time.

## **Building L.I.F.E.™ Program – What's next?**

The broad vision for Building L.I.F.E.™ is to transform safety on all projects to a more front-line driven and participatory climate. To reach that point, the process will first need to be expanded to other projects within the selected Business Unit, then to other Business Units. However, challenges abound with different contract arrangements, different project owners or client types, different sizes, shapes and time frames for projects.

## **Summary**

Building L.I.F.E.™ is intended to build upon, not supplant, traditional construction safety processes. It was developed as a means to avoid or move beyond the (safety) plateau effect, and was designed to seek increased involvement from front-line workers in the safety process. As involvement and active participation increases, so does their ownership of the daily safety process. Ultimately by working this model consistently, it fosters a better educated workforce that makes safe decisions, even when no one is watching, not only for themselves but also for others around them. The practice of safety evolves from a mandate to a value. To help realize this evolution, the Building L.I.F.E.™ process design includes several key elements:

- A repeatable continuous safety improvement model, with an upstream focus on risk, rather than a downstream focus on incident and loss. This model has been incorporated into the pre-planning process through the development of the Job Hazard Risk Assessment (JHRA), during which contractors assist with the identification,

understanding, and reduction of anticipated risk. The completed JHRA is reviewed with front-line workers at mobilization to provide an opportunity for modification (and the benefit of being involved).

- An effort to continuously seek input and engagement of front-line workers in the safety process. This could take the form of the JHRA review, Daily Take-5 meetings, Five worker lunches, Opportunities to participate (and make risk reduction suggestions) in regular project meetings.
- Wide spread participation in the behavioral safety process at several levels on the project that includes:
  - Front-line workers helping to identify critical safe behaviors
  - All levels of contractor supervision involved (and educated in) the effective delivery of feedback on observed performance
  - Incremental expansion of the behavioral observation process toward the aim of building and sustaining safe work habits

All of these elements working together can transform the cultures on our projects by focusing on safety done *for* the workers, rather than safety done *to* the workers. This change does not happen overnight. But it does happen one observation at a time, one safety talk at a time, one JHRA at a time and one conversation at a time. Through this worker engagement, we can all build a culture where Living Injury Free Everyday becomes a reality.

## **Bibliography**

Guastello, S. J. (1993). Do we really know how well our occupational accident prevention programs work? *Safety Science*, *16*, 445-463.

Reason, J. T. (1990). *Human Error*. New York, NY, Cambridge University Press.

Tolbert, George D. "Don", Residual Risk Reduction: Systematically Deciding What is "Safe", *Professional Safety*, November 2005.