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Assessing the Best-in-Class–What Drives Superior Safety Performance?

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Introduction

The purpose of this paper is to describe a process for the development and implementation of a tool for assessing high performing projects and for the identification of common characteristics of those projects that drive superior safety performance.

Once identified, these common characteristics can serve as focus areas that can be replicated across the company, provide a consistent framework for independent assessments, cold eyes reviews, and other similar activities, and enable more effective start-up of new projects.

Background

Jacobs Engineering was incorporated in 1957 as an engineering and design company primarily servicing the chemical process and hydrocarbon industries in the US Gulf south. After going public in 1970 with approximately 600 employees, Jacobs Engineering entered the direct-hire process plant maintenance and construction business in the early 1980s. Since then, growth into diverse markets and locations has given rise to a complex organization operating in a global market facing many challenges, including the challenge of keeping employees, subcontractors, clients, and the public free from harm.

The Jacobs safety program evolved from the application of traditional construction safety approaches typical of those primarily motivated by conformance to OSHA standards. The processes applied today were developed in the mid-1980s and refined over the next decade, while the corporate OSHA recordable incident rate dropped from 4.7 in 1986 to 0.54 in 2006 and 0.43 in 2007. During the same period the field operations Workers' Compensation case rate has fallen from 1 case per 11,000 hours worked to less than one case per 100,000 hours worked. However, performance as measured by recordable incident rate has leveled out over the past three years with the Construction Industry Institute (CII) average, used as corporate benchmark, closing the

gap with Jacobs (Exhibit 1). Although this level of performance is good, people still continue to get hurt and that is unacceptable.

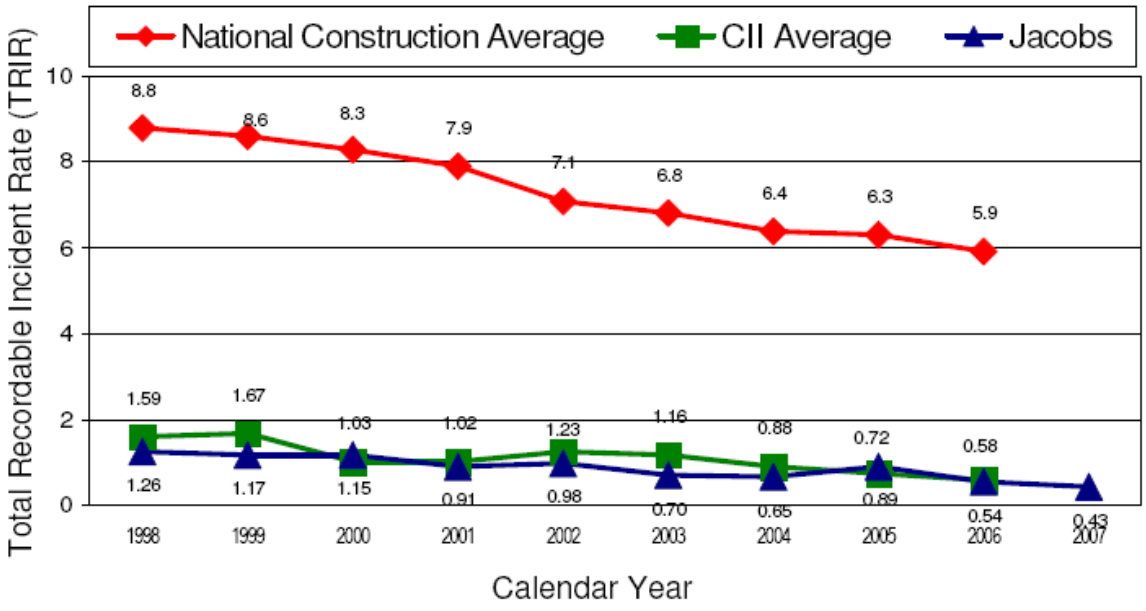

Exhibit 1. Performance is good but has flattened in recent years.

Jacobs Engineering, like many engineering and construction services companies, has continually strived for improvement in safety performance, with an ultimate goal of zero injuries to personnel. Many companies have embraced the notion that it is possible to achieve zero incidents on a project or as an entire organization. Others, like Jacobs, have adopted strategies and implemented initiatives to not only achieve and sustain superior or "world class" safety performance but to ultimately achieve zero injuries across the company.

Global Executive Safety Committee

The Jacobs Global Executive Safety Committee (GESC) is comprised of twenty employee members from across the globe, including a chairman who is a member of operational executive management. The membership represents a cross section of both operational and functional organizations as well as experience, both with the company and with safety in general. The committee is facilitated by two members of executive safety management and supported by representatives of the safety management team, who serve as adjunct members and technical advisors. At the time of this work, the committee was supported by fourteen senior safety managers from around the globe. The current committee is supported by four safety directors with global safety oversight responsibility. The committee members, appointed by executive management, serve two-year terms with half the membership rotating off each year.

Originally assembled to provide an opportunity for networking and learning, the committee has in recent years become more actively involved in activities and initiatives to support the corporate quest for significant improvements in safety performance. In fiscal year 2006, the committee focused on the development of a tool to assess leadership engagement in safety, identification and use of leading metrics, and incorporation of system safety concepts in key safety processes.

In fiscal year 2007, the principal focus of the committee was on the assessment of top performing projects sites that clearly demonstrated "best-in-class" performance. The objective was to better understand the processes, tools, and procedures, and how they are applied at those projects to produce superior results. In addition to assessing the processes, tools, and procedures, the committee also chose to focus on the "practice" of safety on best in class projects. For the purpose of this initiative, practice was defined as the culture, enthusiasm, passion, engagement, discipline, and the way things get done – which characterize the top performing sites.

To accomplish this work, the GESC met three times as a complete committee during the course of the year. In addition, subcommittees met as required to achieve individual objectives, including travel to project locations to perform the assessments.

Project Selection – Defining "Best-in-Class"

Jacobs operates in a broad range of industries, thus three broad categories of projects were chosen for assessment: 1) continuous presence (operations and maintenance), 2) construction – self perform, and 3) construction – construction management/subcontract.

Three primary criteria were established for defining best-in-class. First, the project needed to be moderately large so that a majority compliment of safety processes, tools, and procedures and would be employed on the project. In terms of project work force, this translated to a project accumulating 300,000 to 400,000 hours in a single year. In addition, the presence of a relatively large workforce would tend to lessen the possibility of a "hero influence" bias in the results. For the purpose of this work, hero influence was defined as the overwhelmingly positive influence of one individual on the safety performance of the entire project.

Second, the project should have demonstrated a level of safety performance that placed it in the upper echelon within the company, either with regards to hours worked per medical case or TRIR, over a sustained period of time. An analysis of projects active for at least a year was performed and those with a safety performance above 200,000 hours worked per medical case or a TRIR below 0.5 were identified as having demonstrated best-in-class performance.

Last, in order to be considered, the duration of the best-in-class project must have been through the timeframe when the assessments were expected to be performed. Since the assessment results were expected to be discussed during the September 2007 GESC meeting, the assessments were scheduled for the March – June timeframe, leaving ample time for data analysis and report preparation.

The projects identified as best-in-class and selected for assessment are highlighted in Table 1. Projects were assigned letter designations to ensure client confidentiality.

Project Category	Project	Industry	Number of Personnel	Performance (hours worked /medical case)
Construction – Direct Hire	A	Hydrocarbon	180	300,000+
	B	Hydrocarbon	600	300,000+
	C	Hydrocarbon	460	250,000+
Continuous Presence – Operations & Maintenance	D	Automotive	180	196,000
	E	Process - chemical	250	200,000
	F	Process - plastics	130	240,000
Construction – Construction Management/Subcontractor	A	Process - chemical	750	300,000+
	B	Automotive – R&D	200	200,000+
	C	Hydrocarbon	450	300,000+

Table 1. These were the projects selected for Best-in-Class Assessments.

Developing the Assessment Tool

Prior to the initial GESC meeting, a subcommittee met to begin developing the Best-in-Class assessment tool. The subcommittee consisted of the GESC chairman, two senior safety professionals, and three senior operations managers, each representing one of the major categories of work to be assessed.

The stated purpose of the tool was to determine the top four or five focus areas (either process or practice, or both) which have the most profound impact on superior safety performance. With that said, the focus of the tool was on the existing processes that make up the Jacobs health and safety program and the practices employed on the individual projects to implement those processes.

As a starting point for the development of the assessment tool, existing audit and assessment tools and processes were reviewed to consider which portions, if any, should be included. The tools and processes that were considered included formal elements of the company health and safety program as well as tools and processes that were used informally across the company. These included the Jacobs Safety Evaluation Process (formal safety audit process), the Leadership Engagement Assessment tool (informal assessment tool), Safety Performance Assessment Team review guidelines (informal tool), and reports from relatively recent cold eyes reviews. Detailed descriptions of these existing tools and processes, along with the Jacobs Safety Program documentation, were provided to each of the subcommittee members in advance of an all-day interactive development workshop.

The first step in the development process involved identification of ten major assessment categories. This was accomplished through a thorough review of the aforementioned audit and assessment tools, discussion regarding relative importance of various elements of those, and an informal voting process to arrive at following categories:

- Planning
- Leadership Engagement (Top Site Leaders)
- Leadership Engagement (Down to Team Leads)

- Workforce Engagement
- Training
- Risk Management
- Customer Engagement in Safety
- Subcontractor Management and Engagement in Safety
- Resources
- Work Execution

The next step involved identifying four or five key elements for major category and, for each element, developing three or four questions that would enable the assessment team to assess responses relative to an established expectation. Thus each best-in-class assessment consisted of evaluating approximately fifty elements related to the processes and practices that characterize the safety program for that project. Exhibit 2 depicts a portion of the assessment tool for the Planning category.

Planning				
	Assessment Element	Questions	Comment	Level 4 Criteria
1	Site wide planning (HASAP)	What role does the HASAP serve in defining the site-specific processes and practices? How are those processes and practices communicated to the workforce?		A well-communicated project level safety plan (HASAP) exists that defines the site-specific processes and practices that are implemented on the site. The HASAP includes a project-level risk assessment which is used to focus attention on higher risk activities. The HASAP is used to guide implementation of HSE process and is reviewed and approved regularly by management.
		What is the review and approval process for revisions to the HASAP? How are you involved in this process?		
		How effective is the site HASAP in identifying and documenting hazards and controls? Give an example of a particular hazard or control that is identified in the HASAP and relate it to a process or practice that helps to mitigate the risk.		
2	Task work instructions	What is the process for defining and communicating task work instructions? How are you involved in that process? How are skills and competencies considered in the assignment of work teams to tasks?		Work instructions are clear and specific and are provided for all tasks. The work instructions are prepared, reviewed, and approved by personnel with the appropriate expertise and help define the safety requirements for the task. The work instructions are integrated with other work control processes. The tasks are assigned to skilled and competent persons.
		What is the process for providing feedback on work instruction information that is either deficient or superior? How are improvements or changes communicated?		
		What role do work instructions serve in communicating safety issues associated with a task? Have you found the work instructions to be beneficial in that regard?		
3	Task planning (SPA)	What is the process for pre-task planning? How is this process implemented and do you find it to be effective?		Pre-task plans are developed for all tasks with participation from all persons involved in the task. The pre-task plans are reviewed by management and supervision during development and implementation
		What is your role in the pre-task planning process? How is the effectiveness of the process and quality of the pre-task plans		And feedback is provided via coaching and mentoring

Exhibit 2. This is a partial example of the actual assessment tool.

Next, tangible and achievable expectations (Level 4 Criteria) were established for each element to provide a basis for subjective assessment. The basis for these criteria were derived from the collective experience of the subcommittee and from the knowledge gained through the review of the various assessment processes and audit tools in use throughout the company. These criteria were later vetted with the entire GESC.

Lastly, a scoring system was established based on a 0 to 4 score with a score of 0 being assigned for no subjective evidence of conformance to the Level 4 Criteria. If all aspects of the criteria were met, a score of 4 was assigned for that element. The assessment team was required to arrive

at a consensus score for each element. The scoring was documented using the Assessment Scoreboard shown in Exhibit 3.

Assessment Scorecard									
Assessment Category	Sub-Element Assessment (0-4)					Average	Self Assessment – Success Drivers		
	1	2	3	4	5		Top 3	Second 3	Third 3
Planning									
Leadership Engagement – Level I									
Leadership Engagement – Level II									
Workforce Engagement									
Training									
Risk Management									
Customer Engagement					N/A				
Subcontractor Management & Engagement					N/A				
Resources					N/A				
Work Execution					N/A				

Exhibit 3. This is the Assessment Scoreboard used to document the assessment process.

Performing the Assessments

To expedite the assessments three teams were assembled, with each team assigned to assess the three projects in a particular project work category. Each team was comprised of two to three operations personnel and one safety representative. In order to prevent bias, the teams were selected such that no member had any direct relationship with the project.

During the first GESC meeting, the assessment teams developed the protocols for performing the assessments. Although the details of the protocols varied from team to team, they generally consisted of the steps shown in Table 2.

Protocol Step	Estimated Time Frame	Purpose
Initial communications with project management at site to be visited	At least two weeks prior to visit	Communicate intent of visit (not an audit), expectations, logistical details, requirements for site personnel involvement
Initial discussion with project/site manager	1 hour	Obtain background information on project including scope of work and organization
Discussions with all levels of project leadership (project/site manager to foremen and team leaders	5 – 6 hours, can be accomplished in small groups (supervisors, foremen, team leads, etc.)	Detailed discussion of all 10 assessment categories and sub-elements in an open inquiry and discussion format for assessment relative to Level 4 Criteria
Tour of project/site	1 – 2 hours, can be accomplished at a convenient time during the visit	Gain understanding of scope of work and informal conversation with employees
Wrap-up	1 hour	Provide preliminary feedback to the project team along with expectations for follow-up
Self assessment by project/site leadership	2 – 4 hours, can be done after the assessment team has departed	Obtain the project leadership's perception of primary drivers of safety performance

Table 2. The general assessment protocol involves a one day visit.

Based on this general protocol, it was determined that a one-day site visit would be sufficient for performing each assessment. Limiting the assessment to one day also helped minimize the potential impact of the activity on the on-going project activities.

The focus of the assessments was the discussions with the project leadership since they were the primary means of gathering information relative to identifying the common characteristics of best-in-class projects. In addition, the assessment teams also documented lessons learned should the company decide to perform assessments on a more formal basis.

At the conclusion of the assessment, the project leadership was asked to perform as self assessment by ranking their perception of which assessment categories were the primary contributors to superior safety performance. The results of the self assessment were documented on the Assessment Scoreboard.

Analyzing the Data

Upon completion of the assessments the results for both the team assessments and the self assessments were compiled by project work type. The results were grouped based on average score then scored and color coded to illustrate overall trends. The assessment results for the three project work types are shown in Exhibits 4, 5, and 6.

Assessment Team Score — Site —			Assessment Category	Site Leadership Self Assessment — Site —		
A	B	C		A	B	C
3.8	3.2	3.8	Planning	1	1	3
4.0	4.0	4.0	Leadership Engagement (Level I)	1	1	1
3.4	3.8	4.0	Leadership Engagement (Level II)	2	1	2
4.0	3.6	3.6	Workforce Engagement	1	3	1
2.8	3.4	3.2	Training	2	2	2
3.0	2.8	2.6	Risk Management	3	2	3
2.75	2.25	3.25	Customer Engagement	3	3	1
2.25	2.75	NA	Subcontractor Management and Engagement in Safety	NA	3	NA
3.5	3.5	3.25	Resources	3	2	3
3.75	3.75	4.0	Work Execution	2	3	2

Exhibit 4. These are the assessment results for Construction – Direct Hire projects.

Assessment Team Score — Site —			Assessment Category	Site Leadership Self Assessment — Site —		
D	E	F		D	E	F
3.4	3.6	3.5	Planning	1	2	1
3.9	3.9	4.0	Leadership Engagement (Level I)	1	1	1
3.9	3.9	4.0	Leadership Engagement (Level II)	2	1	1
3.5	3.8	3.5	Workforce Engagement	2	2	1
3.0	3.3	3.5	Training	3	3	
3.2	3.5	3.0	Risk Management	2	3	
3.9	3.9	N/A	Customer Engagement	1	1	
N/A	N/A	3.5	Subcontractor Management and Engagement in Safety			
2.9	2.8	3.5	Resources	3	3	
3.0	3.1	3.5	Work Execution	3	2	

Exhibit 5. These are the assessment results for Continuous Presence – Operations & Maintenance projects.

Assessment Team Score — Site —			Assessment Category	Site Leadership Self Assessment — Site —		
G	H	I		G	H	I
2.8	1.5	4	Planning		2	2
4.0	1.8	4	Leadership Engagement (Level I)	1		1
3.6	1.2	3.8	Leadership Engagement (Level II)	2		2
2.6	0.8	3.8	Workforce Engagement	1	1	
2.6	1.0	3.8	Training	2	2	
3.0	1.0	4	Risk Management	3	3	1
4.0	2.5	4	Customer Engagement			1
4.0	1.5	3.9	Subcontractor Management and Engagement in Safety		2	2
3.3	2.3	N/A	Resources		1	
2.5	1.8	3.8	Work Execution		1	

Exhibit 6. Construction – These are the assessment results for Construction Management/Subcontractor projects.

Next, the primary contributing characteristics, identified using the Exhibits above, were collected to illustrate overall trends for all the best-in-class projects. The primary contributing characteristics identified by the three assessment teams for the nine projects assessed are shown in Exhibit 7. The primary contributing characteristics common to all projects were leadership engagement (both Level I and Level II), customer engagement, and planning.

Assessment Category	A	B	C	D	E	F	G	H	I
Planning	■		■						■
Leadership Engagement (Level I)	■	■	■	■	■	■	■	■	■
Leadership Engagement (Level II)		■	■	■	■	■			
Workforce Engagement	■								
Training									
Risk Management									■
Customer Engagement				■	■		■	■	■
Subcontractor Management and Engagement In Safety							■		
Resources								■	
Work Execution			■						

Exhibit 7. The assessment team results show the common primary contributors.

Similarly, the primary contributing characteristics identified by the project teams during the self-assessments are shown in Exhibit 8. Clearly the common characteristics identified by the projects through the self assessment process were leadership engagement (Level 1), workforce engagement, planning, and customer engagement.

Assessment Category	A	B	C	D	E	F	G	H	I
Planning									
Leadership Engagement (Level I)									
Leadership Engagement (Level II)									
Workforce Engagement									
Training									
Risk Management									
Customer Engagement									
Subcontractor Management and Engagement In Safety									
Resources									
Work Execution									

Exhibit 8. The self assessment results show the common contributors.

The subcommittees met to compare and contrast the common contributing characteristics from the team assessments and the self assessments. These discussions, along with a review of observations and comments made during the assessments, were used to identify common themes shown in Table 3. For each common theme, several defining characteristics were identified. These defining characteristics were identified primarily through the collective observations of the assessment team members made during the assessments.

In addition, the observations made around leadership engagement and culture of caring were used to develop a profile of a "passionate safety leader". The committee fondly referred to this passionate safety leader as "Dave" after an actual project manager that demonstrated many of these qualities. A "Dave" leader is characterized by:

- Recognizes the need to clearly paint a vision and hold people accountable in a positive atmosphere – causes people to think, causes people to coach and mentor, causes people to engage in the process
- Fostering a culture of caring – not a directive leader
- Having a passion for doing what is right and influencing others to be better leaders
- Using team planning sessions to teach but also taking advantage of one-on-one teaching opportunities
- Taking full responsibility and accountability for safety without waiting for outside influence or direction
- Being a proactive and engaged learner of safety and leadership skills

Common Theme	Characteristic
Leadership Engagement	• Genuine/passionate ownership of safety start with top site management • Routine visibility in the field by all levels of site leadership • Clear expectations and acceptance of accountability for safety by all site leadership • Coaching/mentoring is routine
Culture of Caring	• Genuine care for each other • Sense of community/family environment • Pairing new workers with experienced workers • Weed out those that do not share the safety culture • Creating a sense of site/project pride
Planning	• Weekly and daily work execution planning, written work packages, pre-task plans are sequenced, risk assessments done • Integrated planning with Client for operating environments • Involvement by all in pre-task planning process
Disciplined Use of Key Tools	• Safety induction led by site manager • Daily safety discussions/tool box meetings • Extensive use of observations that involve immediate/constructive interaction between observer and the observed • Robust training program/worker orientation

Table 3. Four common themes were identified.

Acting on the Results

The results from the Best-in-Class Assessment activity were communicated across the company via management meetings and intranet communications. However, at the time of this work, the assessment process has not been formally incorporated into the company health and safety program. Consequently, much of the company has yet to benefit from the application of the lessons learned from this activity.

Elements of the Best-in-Class Assessment tool have been incorporated into the formal safety audit process and appear to making a positive impact on how the company is assessing effectiveness of planning and leadership engagement, as well as the project-level approach to instilling a culture of caring in our approach to leadership in the implementation of construction and continuous presence projects.

Summary and Conclusions

The question remains – what drives superior safety performance?

For Jacobs the Best-in-Class Assessments have, at a minimum, provided tangible and achievable expectations for project leadership in the execution of construction and continuous presence operations and maintenance projects. In addition, the tool can be used, either in part or in whole, as a powerful self assessment against proven internal benchmarks.

The work of the Global Executive Safety Committee has validated the importance of the four common themes of leadership engagement, culture of caring, planning, and disciplined use of key tools. However, projects should not and can not abandon the remaining suite of processes and tools to focus solely on these four common themes.

A holistic approach to achieving the ultimate goal of zero injuries involves effective implementation of proven processes and tools with engaged and passionate leadership in an environment that places value on caring for employees.