43rd Annual ECC Conference
engineering and construction contracting association

Journey Into Uncharted Territories

September 7-10, 2011
JW Marriott Desert Ridge, Phoenix, AZ

How are owners, contractors and suppliers adapting to successfully execute projects and reposition their businesses in the ever evolving project environment?

Repositioning the Project's Business in a World with Changing Boundaries
43rd Annual ECC Conference

Safety on Construction Abroad

EZIO VILLA

Journey Into Uncharted Territories

Breakout Forum

Director of Engineering
Jacobs Italy

Repositioning the Projects Business in a World with Changing Boundaries
ECC Safety on Construction abroad

Agenda

- The Engineering Contractor Perspective
- A significant experience: Lilly Sesto (Italy) Project
- Safety in Jacobs - Beyond Zero
- Conclusions
Safety Topic:
Too much focus on Metrics Vs larger risks?

• For sure metrics and procedures have been key in driving tremendous improvement in world safety and specifically in the high industrial Countries;
• The question is: can we achieve additional improvement in this way? or do we need to explore new ideas and ways to challenge the seemingly stagnation?
• An Outside US perspective.
The Engineering Contractor Perspective
All US/international Engineering Contractors are faced with a lot of challenges when performing construction work abroad.

Some challenges arise when the workforce is faced with differences like:

- Sectors: Industrial vs Residential.
- Greenfield vs Existing Facilities
- Construction work in parallel with operation activities
- Fast track projects

Some are related to international environmental:

- Geographies (culture, workforce, ...)
- Languages
- Global vs Local culture
- Works methods
- Legislation

Safety in an international environmental
Currently 27 Member States of the European Union follow EU Directives on HSE.

Member States (blue) and Candidate Countries (yellow) of the EU.
Safety in Europe

• EU–OSHA - European Agency for Safety and Health at Work. Established by EU in 1996. It is the main reference subject on HSE.
• Different progress and implementation of EU Directives among EU countries.
• Different local HSE legislation in European Non-EU countries.
• Necessity to use local HSE expertises in each European country, in particular in Non-EU countries.
• Low HSE quality and culture in all Eastern European Countries.
Safety in Italy

- Only Industrial and Global Companies are referring to OSHA
- Most of the injuries are covered by INAIL (National Insurance for the Injury at Work)
- Almost always after a doctor visit a person receives days off.
- Example of INAIL statistic: 1 recordable (3 days off) every 20,000 hours worked on Sites. This represents more than 5 times the US level
- The focus is still mainly based on attention to statistics and defensive approach from legal problems coming from rules not respected
- The real situation of the Safety in Construction in Italy is improving due to the EU and Local laws but is still far from US.
A significant experience
Lilly Sesto (Italy) Project
Project background

• Complete redesign, upgrade, renovation and new construction of an existing pharmaceutical facility in parallel with manufacturing activities
• Long term relationship between Client and Engineering company in US
• First project experience of Jacobs with Lilly in Italy
• Involvement from beginning at corporate levels
• Evaluation and adaption to local construction standards (Authorities, subs, materials, workforce, etc)
• HSE aspects has been highlighted as a challenge at an early stage.
Project metrics

- Project construction value about 300M$
- Construction developed in 6 main Phases
- Construction started in 2005 and lasted in 2011
- 165 contractors involved
- 4052 workers inducted
- Recordables (2)
- Lost time (2)
- No Injuries since March 2007
- 0.39 LTIR
- 0.78 TRIR
- 667,000 safe work hours vs 1,012,706 worked hours
Some Data

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Training</th>
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<tbody>
<tr>
<td>Worked hours</td>
<td>1,012,706 Workers Inducted</td>
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<tr>
<td>Total Site workhours without injuries</td>
<td>667,003 Lilly Rep. Trained</td>
</tr>
<tr>
<td>Total Recordable Incident Rate</td>
<td>0,78 Jacobs Rep. Trained</td>
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<tr>
<td>Lost Time Incident Rate</td>
<td>0,39</td>
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<tr>
<td>Property damage (PD)</td>
<td>5 Weekly Coordination Meetings</td>
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<tr>
<td>Near Misses (NM)</td>
<td>32 Toolbox Meetings</td>
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<tr>
<td>First Aid Case (FAC)</td>
<td>8 Safety Leadership Meetings</td>
</tr>
<tr>
<td>Recordable Incident (RI)</td>
<td>2</td>
</tr>
<tr>
<td>Lost Time Incident (LTI)</td>
<td>2 SOR</td>
</tr>
<tr>
<td>Total Recordable Incident (TRI)</td>
<td>4 SIR</td>
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<tr>
<td>SPA</td>
<td>1431</td>
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</tbody>
</table>

IMF/Si II/Apollo 4 PROJECT IN NUMBERS (O38 data included)

Audit & Control

SOR 3477
SIR 255
SER 14

Meetings

Weekly Coordination Meetings 279
Toolbox Meetings 1235
Safety Leadership Meetings 50

Planning
The Safety context

• Sesto was not a potential catastrophic Project but like every Construction activity, was potentially subject to the relevant risks of multiple injuries or fatalities (for example uncontrolled demolition, fire, collapsing of multilevel scaffold…);
• Since Basic Design Phase a Safety Program according to US/OSHA and Local standards has been implemented
• Safety was identified as the first priority
The Safety program

- Tools and methods:
  - Meetings;
  - Trainings;
  - SPA’s;
  - Audit, Tests, Control & Observation (SIR, SER, SOR);
  - Monitoring of safety violations: scorecard & zero tolerance program in parallel with rewards & recognition program.

- Analyzed data:
  - Near Misses, Property Damages, Motor Vehicle Accident;
  - Incidents (Environmental, Lost time, Recordable);
  - First Aid Case; Medical Treatment Case, Day Away from Work;
Critical aspects

• The Lilly and Jacobs teams were not close to the HSE expected vision: too focused on the trailing metrics of injury rates vs a focus on the leading metrics (that allow us to identify issues before an accident occurs).

• Subs didn’t understand our Safety Program and their safety approach was not proactive

• The program started to use the leading and trailing metrics to drive the involvement of the workers and of all levels of Management;

• During the initial phase of the Project data was merely collected as yet another set of indicators. The intent of lead indicators were not truly understood

• Project experienced 4 Recordables at the beginning of the construction
How incidents happen

- Where does the SOR & SPA take place?
- Where does the Near Miss take place?

Root Cause

Indirect Cause

Direct Cause

Accident

Loss

Organizational Failure

Personal Lack Of

Unsafe Act

Unsafe Condition

Unplanned, Undesired Event

Results in a Loss

LACK OF PRE TASK PLANNING (SPA)
Safety program improvement

- Strong action at Lilly and Jacobs management level to shake the system.
- A cultural change step has been introduced. The new vision became a reality for the Project Team: Consistency in the application of the tools and the individual commitment.
- Safety leadership meetings introduction.
- Tailored project procedures, audits, tests and inspections.
- Involvement at all levels.
- Communication, Innovation, Continuous improvement.
- Meeting & Planning...sharing the targets.
- Investigation...sharing the near miss lessons learned (at all level: engineering design, office, workers).
- Team building, rewards & recognition program.
- Zero Tolerance Program.
- Foreman evaluation and recognition; we believe was a strong vector of improvement and culture change.
Communication, innovation, continuous improvement

Are you wearing all the personal protective gear that's required?

Take a look at yourself in the mirror!
Meeting & Planning...sharing the targets
Training & toolbox
Basis of success

- Client and Eng. Contractor Culture, Vision, Global presence, and real knowledge at local level.
- Management honest with clear expectation and commitment.
- Leadership.
- Alignment of each organization to project goals.
- Dedicated Resources.
- Understanding of risks from SOR, near miss, and dangerous situation and implementation of relevant measures.
- Extensive use SPA.
Basis of success

- B.Z. commitment workshops
- Team work
- Communication
- Continuous improvement efforts, innovation, involvement
- Enthusiasm
- Discipline
Safety in Jacobs
Beyond Zero
Safety in Jacobs

• Safety is more than policies and procedures; it’s how we do business and it’s how we live.

• We believe that we owe it to our employees to help keep them and their families, communities, our clients and our contractors healthy and happy.

• As individuals we are committed to making safety a personal value and taking responsibility for ensuring no one is injured on or off the job – including our colleagues, family and friends.

• The Integral Approach is a must.
Beyond Zero initiative – Why?

• Jacobs believes that current established process of improving safety through routine initiatives yields limited and slow results.

• 3 years ago Jacobs launched the BZ initiative focus to make a big Step change in the improvement.

• The leadership and commitment of the Senior Management led to implementing the Program throughout all levels of the Organization. This has been key to understand, digest and embrace a new vision and a new way of:  
  “Living and Doing business.”
Beyond Zero at Jacobs

- Beyond Zero is not just about driving numbers down;
- The BZ approach is to go beyond the numbers and the statistics;
- It is about removing the “potential” for incidents to occur;
- Beyond Zero is a mindset change that involve all aspects of life.
Beyond Zero initiative: definition

- BeyondZero is about thinking of possibilities; a belief that we can achieve a workplace free of incidents and injuries. But we’re not stopping there!
- BeyondZero is an integral approach to being incident and injury free

“Our Culture of Caring inspires mutual respect and personal accountability.

It creates the deep emotional commitment, active engagement, and courage to drive excellence in safekeeping and all that we do.” C. Martin
### Beyond Zero: a Culture of Caring

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<thead>
<tr>
<th>Subjective</th>
<th>Objective</th>
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<tr>
<td><strong>Intention</strong></td>
<td><strong>Behavior</strong></td>
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<td>- Values</td>
<td>- Plans</td>
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<td>- Attitudes</td>
<td>- Actions</td>
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<td>- Commitment</td>
<td>- Decisions</td>
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<td>- Responsibility</td>
<td>- Performance</td>
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<td>- Experience</td>
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<td>- Morale</td>
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<td>- Myths &amp; Legends</td>
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<td>- Justice</td>
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<td>- Fairness</td>
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<td>- Covenants</td>
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<td>- Policies &amp; Procedures</td>
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<tr>
<td>- Economics</td>
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<tr>
<td>- Contracts</td>
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Diagram shows:
- Incidents over Time
- ‘Rules’
- ‘Training & Tools’
- ‘Behaviours’
Conclusions
Identify Challenges and Issues

• Company vision on Safety
• Management attitude/involvement
• Belief
• Alignment at all level
• Safety culture (Client, Eng. Contractor, Local subs, Resources, Business, ..)
• Communication (languages, understanding, visual)