Site Personnel Index (SPI)

A Manpower Efficiency Benchmarking Program

SPI – History

- Developed and validated by Shell over time since the 80's
- Used for refineries, chemical sites and LNG sites
- Used regularly by Shell, Shell JVs and affiliates as well as 3rd parties
- Licensed and used regularly by World Class Companies
- Benchmarking license (methodology, IP, software, consented data, etc.) transferred to PTAI in October 2009

SPI - Methodology

- SPI benchmarks how efficiently personnel are used to operate, maintain and support assets
- Compares sites that differ in number and types of processing units and size of units
- Creates a 100-based index by normalizing the total hours worked at a site independent of the overall configuration
- *Not* aiming for comparison of personnel costs or hours per unit of production

SPI - How does it work?

- Translation of actual number of hours worked into a uniform organization with 22 job categories
- Comparison for all “Standard Activities” in production sites
- Normalization via the site complexity, expressed as a factor called “Normalized Shift Positions” (NSP)
- Expressed as an index

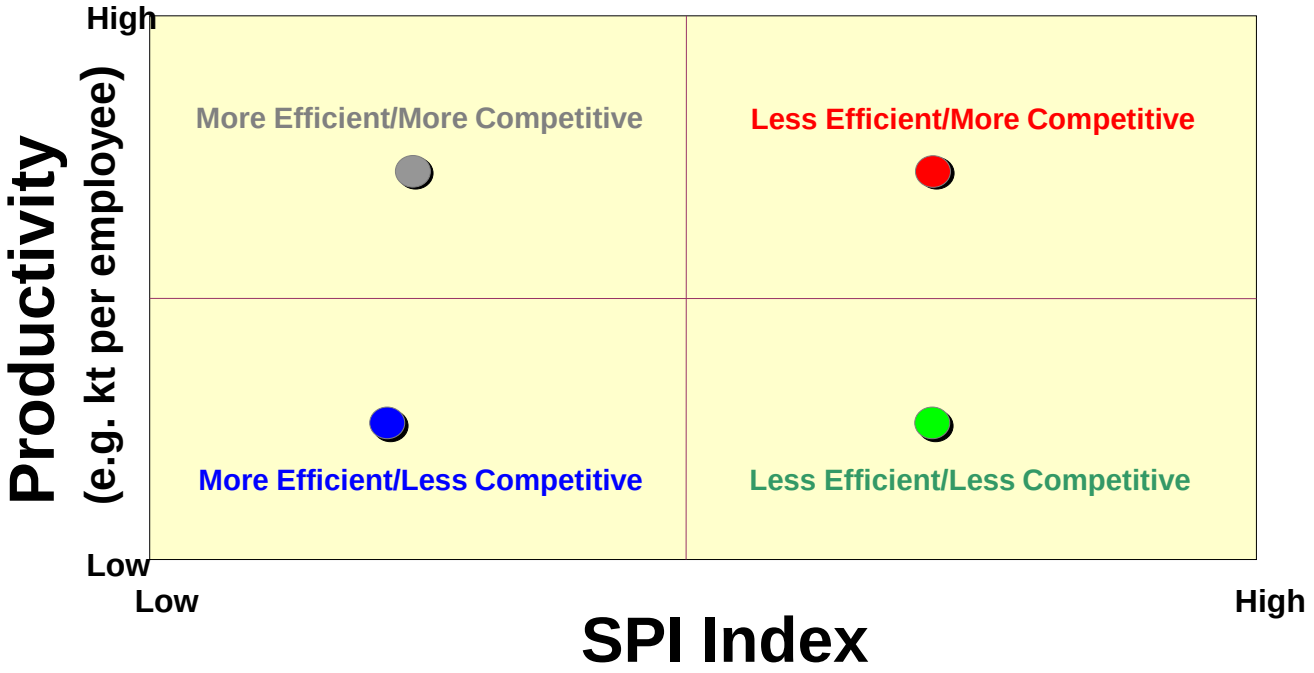
Why was SPI developed?

- to see how efficiently a site uses its personnel
- to compare sites that differ in capacity, technology and labour costs

- to build networks within the company
- to identify best practices, then to share them
- to harmonise organisational structures

- to have a baseline for target setting and improvement programs

SPI and Traditional Productivity Benchmarks



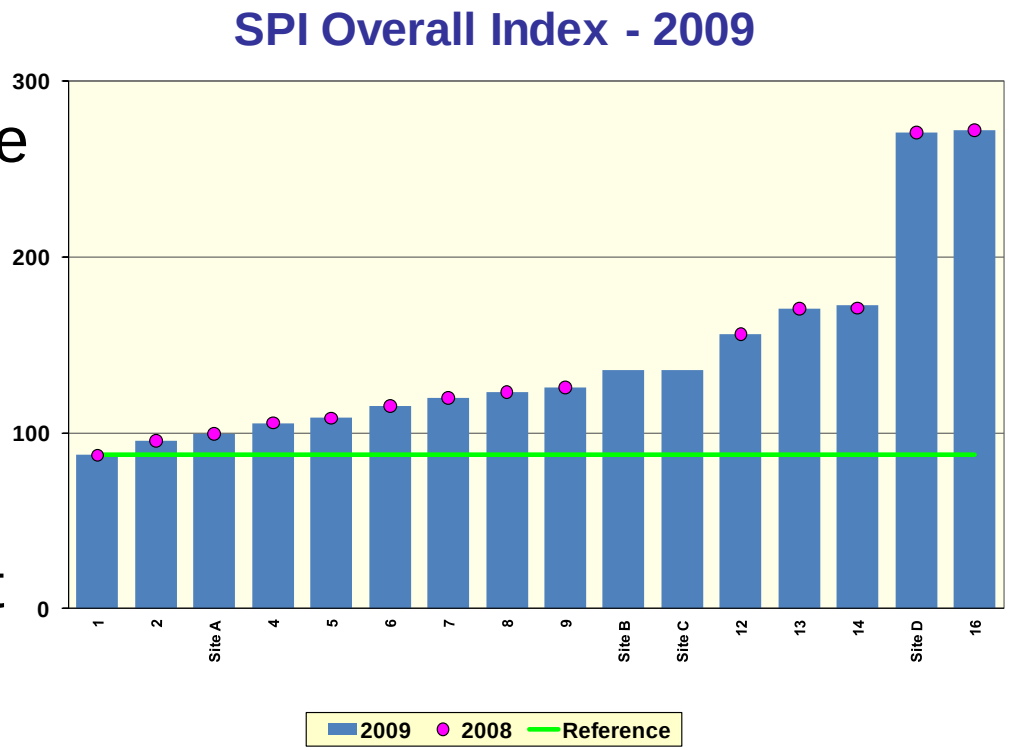
Traditional benchmark measurements look at productivity or competiveness, they do not measure efficiency, this chart illustrates that a company can be More Competitive (upper half of vertical axis) but may still be inefficient with manpower! SPI focuses on efficiency and complements traditional benchmark tools

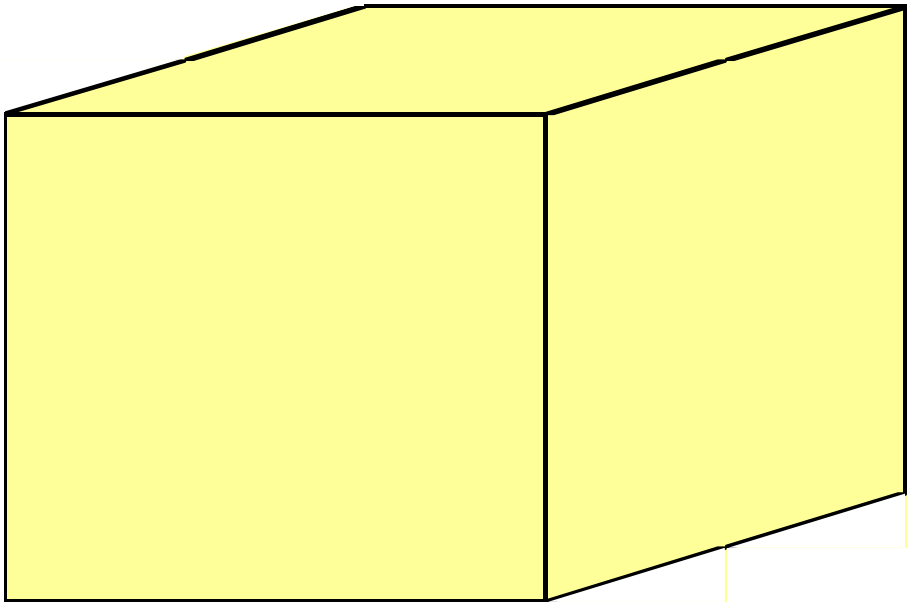
How do Companies use SPI?

- For existing units, optimizes level of staffing across 22 job functions
- Sets staffing levels for new units
- Establishes personnel levels following site restructuring
- Highly effective at monitoring personnel efficiency at established sites

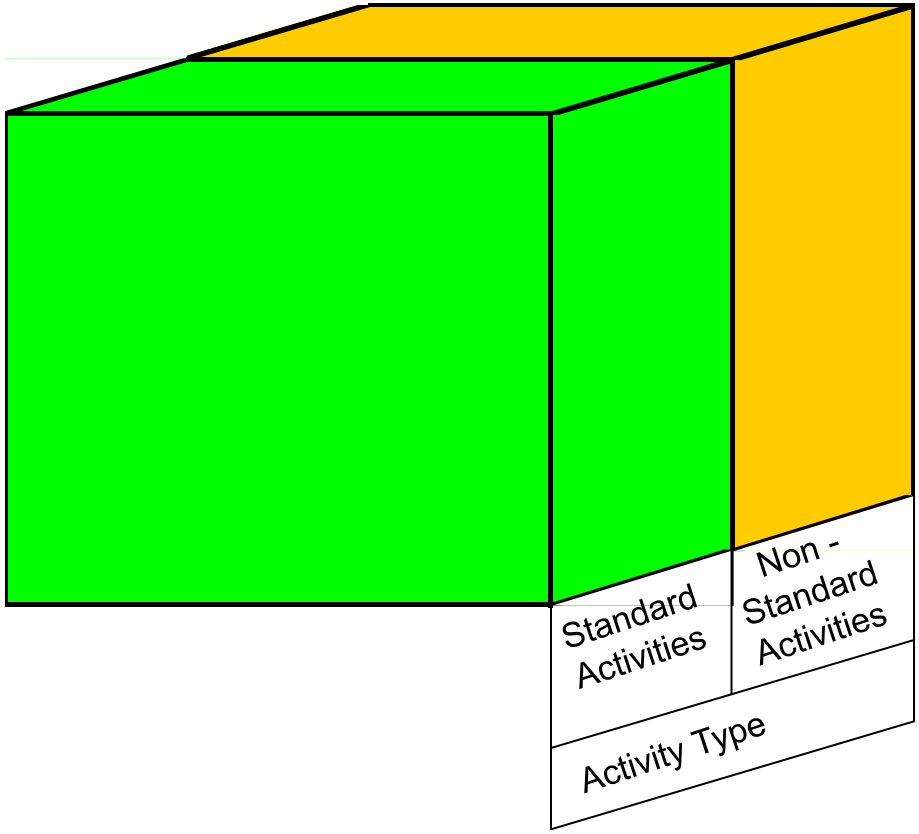
Monitor Site to Site Efficiency

- Multiple sites in a study provide a common basis to make comparisons
- Participation in multiple years will highlight improvement trends
- Best practices can be shared across different sites

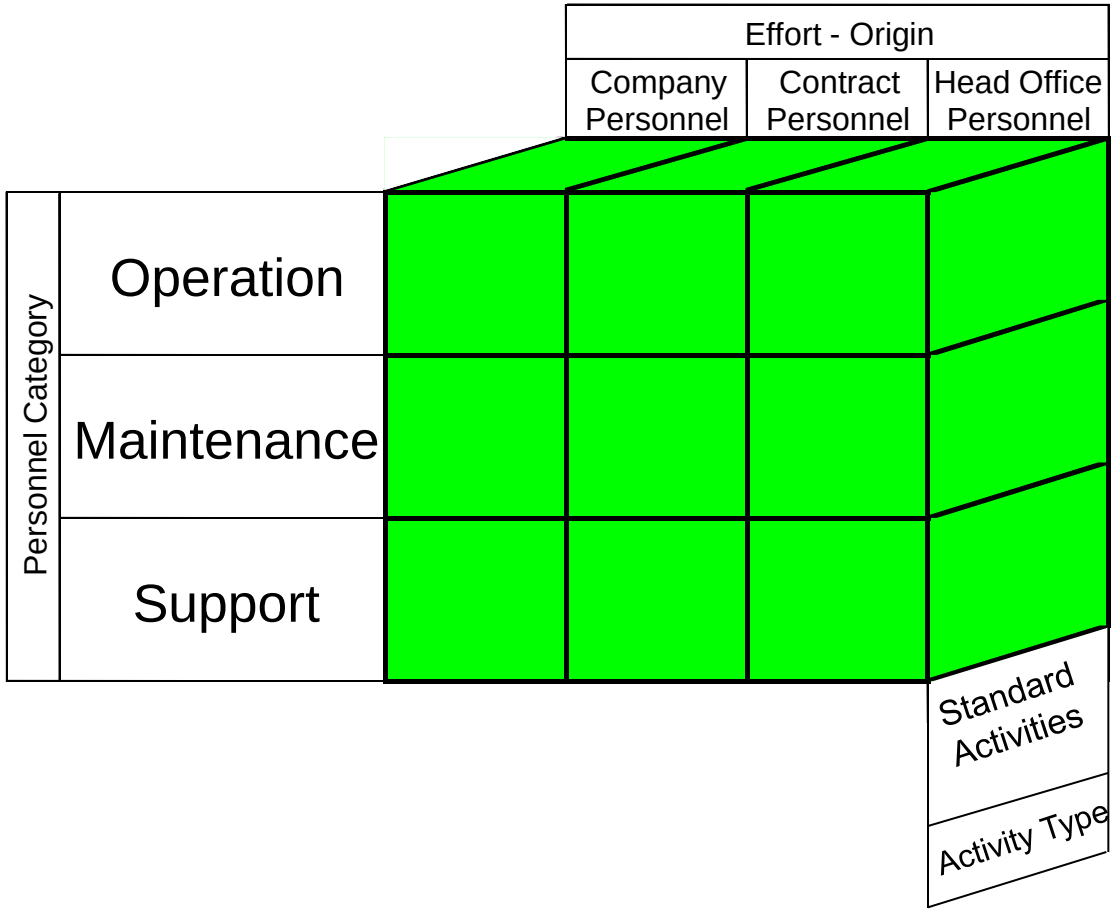


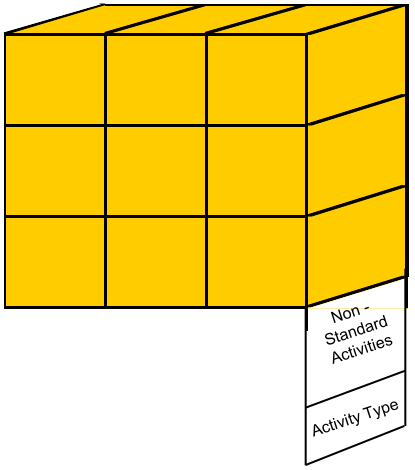


Total Personnel effort visualized as a *cube*



Separate Standard vs Non-Standard Activities

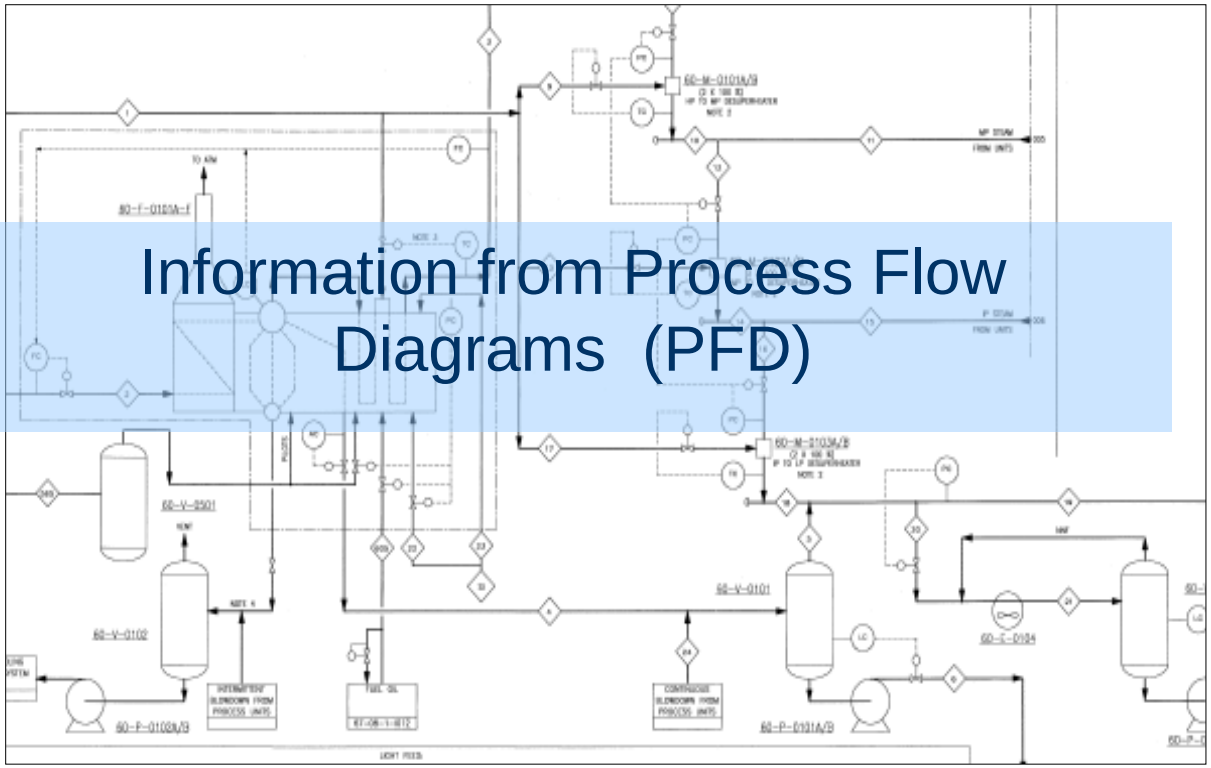




Three Main Categories from three sources get broken down into 22 activities

Normalized Shift Positions

- NSP is defined as amount of hardware that one operator can operate safely and sustainably.



Total NSP for a site may be more than150 NSP

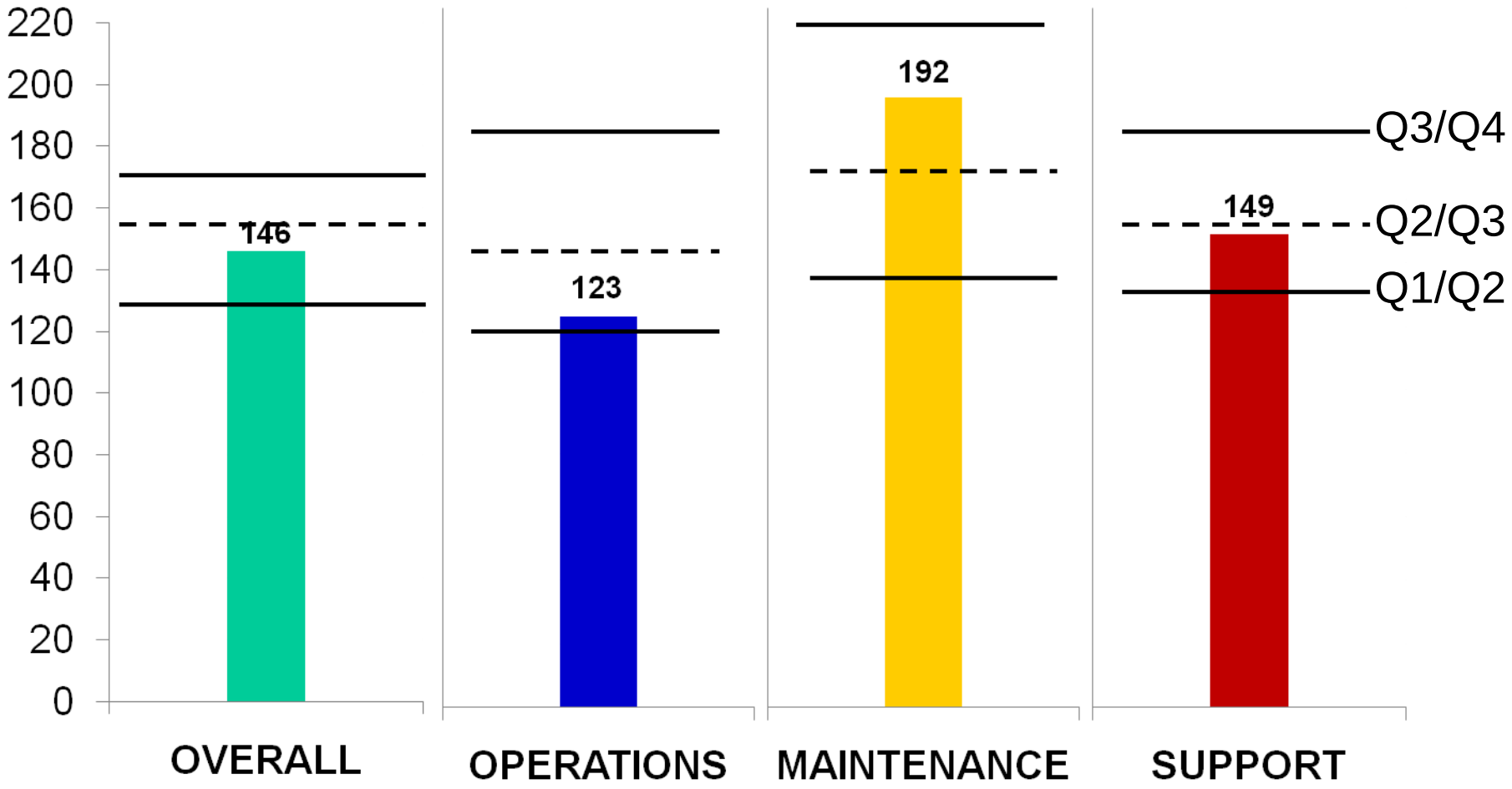
Creating an Index

Using the collected information, indices are created for:

- overall
- operations
- maintenance
- support

$$SPI = \frac{\text{Worked Hours [hr]}}{\text{Site Complexity [NSP]} * \text{constant}}$$

SPI vs Comparison Group



Examples of Other Metrics Provided

- Average lost time due to illness and injuries
- Average % paid overtime
- Annualized turnaround maintenance hours as a % of total maintenance
- Average Span of Control
- Non-standard activities as a % of standard activities

SPI New Client Project Timeline

Introduction & Training	Data collection	Data analysis	Report generation
2–3 weeks	4–8 weeks	2–4 weeks	2–3 weeks
Site review of SPI input manual and data collection instruments	Data collection coordinated by site focal point		
SPI training by PTAI	Assessment of site complexity by PTAI		Management presentation

Typical projects take from 3 to 4 ½ months

Conclusions about the SPI methodology

- The SPI methodology is a unique and well proven tool to benchmark personnel efficiency across industries (e.g. Refineries, Polymer, Chemicals, and Gas Plants, etc.).
- Established track record in identifying areas for efficiency improvements between 25% to 50% on total hours worked in manufacturing facilities.
- We work in partnership with customers to provide the foundation for efficiency improvements.