SAND2007-0202C

JOWOG 30–8: Strategic Infrastructure Planning

Safety Performance and Programs

January 17, 2007

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Sandia National Laboratories

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Integrated Laboratory Management System

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Engage the Customer/Stakeholder

Understand and Satisfy Requirements

Provide Leadership

Develop and Deploy Vision, Strategy, Goals

Assure, Assess, and Improve

Accomplish the Mission

Satisfy Customer Needs

Create Sustained Value

Achieve Mission Success Through Operational Excellence

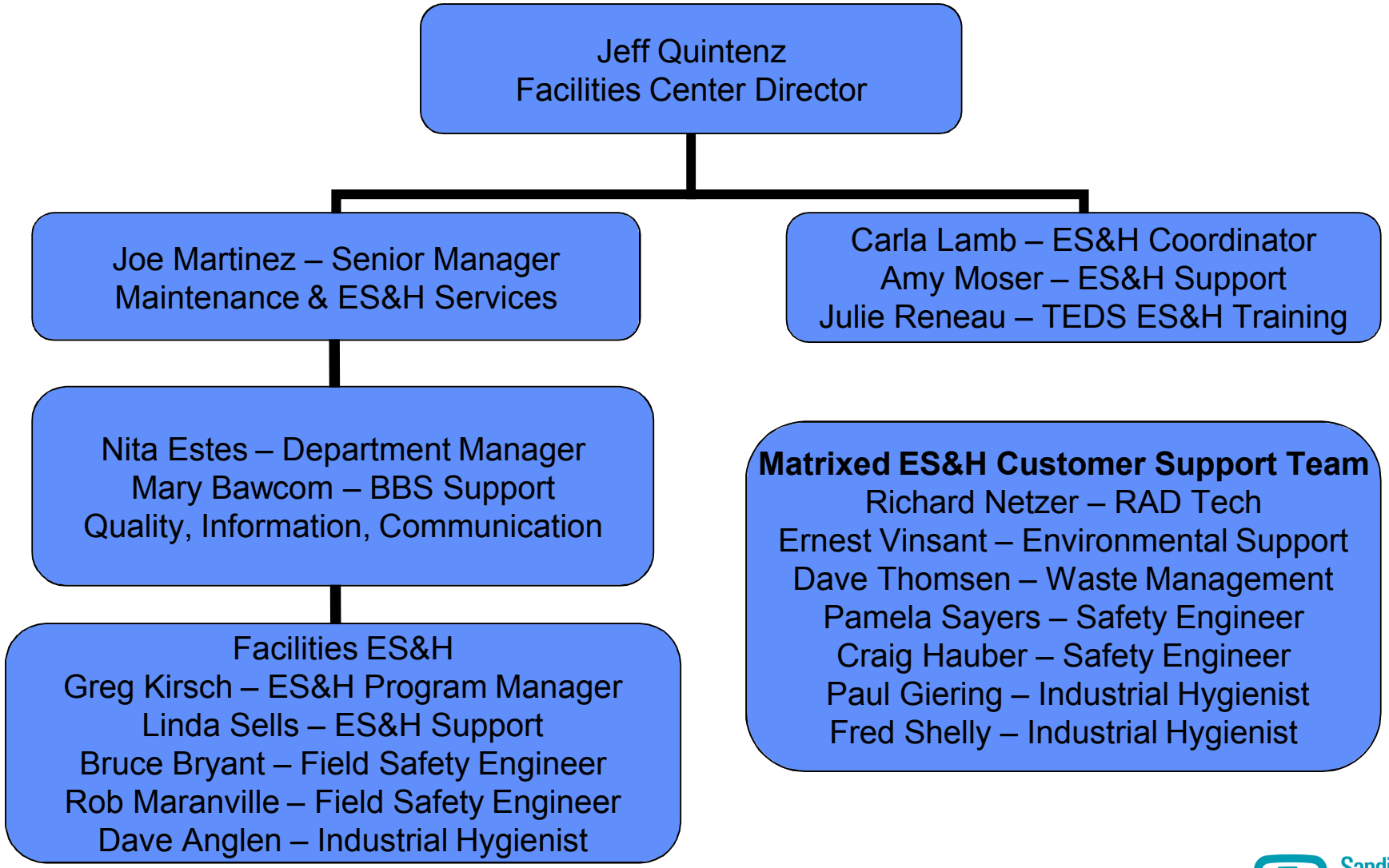
ILMS is Sandia's enterprise model and is the framework for all management requirements at Sandia.

Corporate Policy on Safety

“No job is more important than your health, your safety, and the protection of our environment”

- Sandia has multiple sites (New Mexico, California, Hawaii, and Nevada), which create unique issues regarding facilities management and safety
- Safety is a primary concern at the highest levels of Laboratories’ management

Facilities Safety Organization



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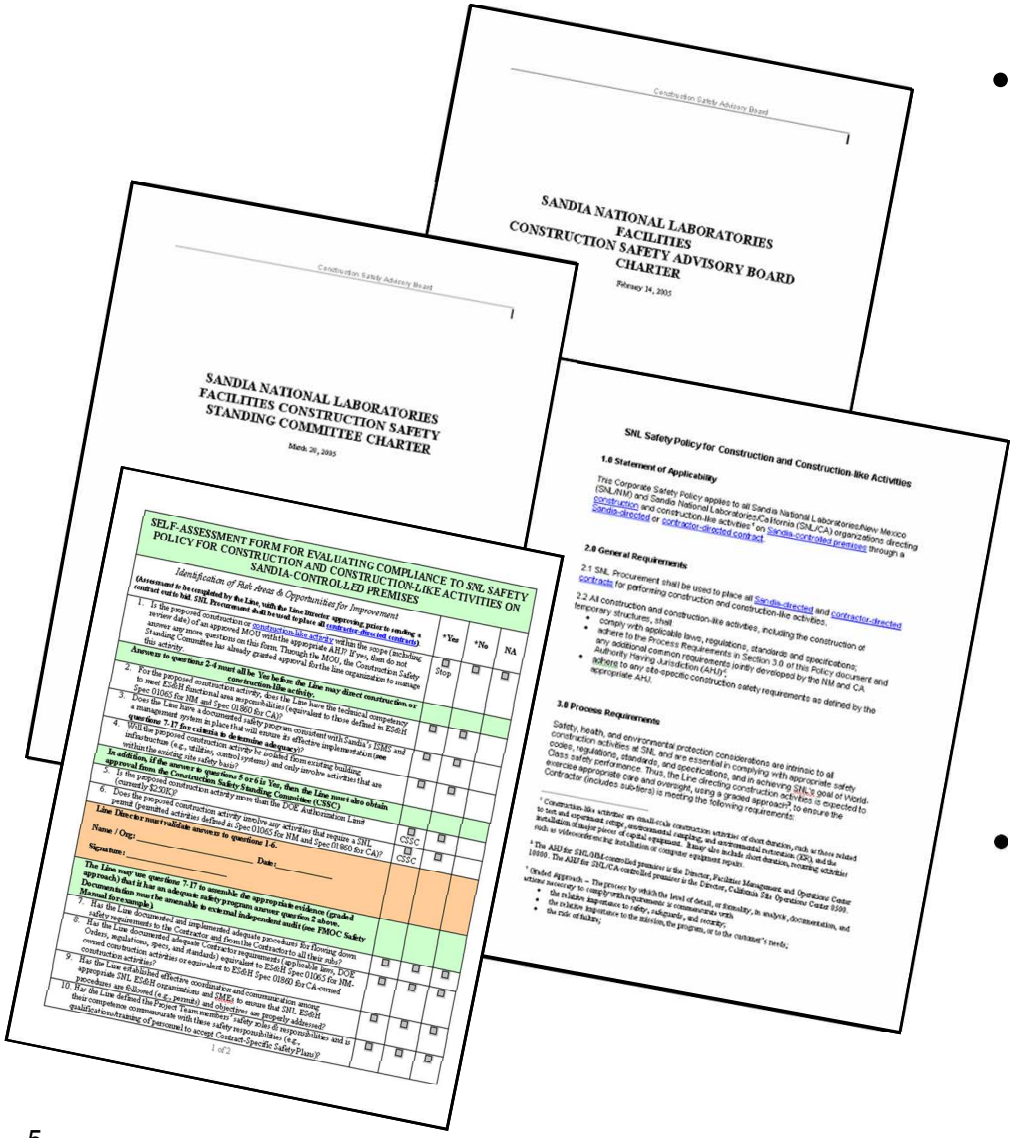
Safety Initiatives

Construction Safety Standing Committee



- This Corporate committee
  - Reviews line organization construction work for adequate implementation of the ES&H Manual requirements
  - Prepared a template for Line Self-Assessment and a plan for the committee to review and approve completed assessments
  - Shares lessons learned
- Allows uniform application of construction safety requirements across the site, leading to operational excellence

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Safety Initiatives
Target Zero Leadership Team

- The Director established a Center-level working group called the “Target Zero Leadership Group” (TZLG) composed of senior managers and safety professionals
- The goal is to think outside the box and develop innovative ways to improve safety
- The team meets regularly to review historical data, metrics, and trends
- The team also mines safety data for correlations between days of the week, months of the year, age of employee…

Safety Initiatives
Maintenance Safety Board

- In October 2005 the Maintenance Senior Manager instituted a Maintenance Safety Board made up of the department managers, ES&H professionals, and himself
- The board observes work in the field on a monthly basis
- A key message given to the workers is that they should never rush, take short cuts, or charge ahead when conditions change. Rather, management expects full adherence to safe behaviors and operating procedures. Management also fully supports stopping work until unexpected situations are addressed with more planning

Safety Initiatives
Behavior Based Safety (BBS)

- Objectives
  - Part of Corporate “Best in Class” strategy
  - Zero injuries, zero fines, zero non-compliances
  - Prevent injuries by using leading indicators
  - Reduce “at-risk” behaviors of workers
- Strategic Implementation
  - Led Division 10000 and Corporation in BBS implementation
  - Workers manage the process; management provides support
  - Prioritized BBS implementation based on work hazards and injury rates: June 2005 – Maintenance and Construction, March 2006 – Computer Users
  - Share lessons learned, documents, and processes with others in the Corporation who are starting BBS implementation

Safety Initiatives
Behavior Based Safety, cont.

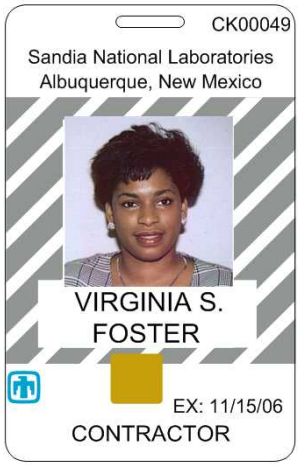
- BBS Process
  - Worker-managed; management-supported
  - Utilize key principles of BBS to tailor for each workgroup: Maintenance, Construction, and Computer Users
  - Perform Pareto analysis of three years of injury data and focus on 5-7 behaviors for each workgroup
  - Identify and focus on the critical (5-7) behaviors that can prevent injuries (Pareto analysis) and develop tailored checklist to address these behaviors for each workgroup
  - Reinforce and redirect those behaviors through observation and positive feedback to the worker
  - Measure the use of the behaviors and the reasons for their use or lack of use to prevent injuries

Safety Initiatives
BBS Safety Challenge

- In support of the BBS program, the entire Facilities Management Team is participating in a safety challenge – leading by example
- The team will buy lunch for the first person who observes any member NOT practicing safe behavior (eyes on path, using handrails on stairs and ramps, walking on designated paths or walkways, etc.) starting December 1, 2006, and ending on February 28, 2007
- Team members who do not get caught during this period will receive a free lunch
- To date, only 3 of 45 members have been caught

Construction Safety Initiatives

Contractor Safety Training



- All contract workers must complete four training classes before they are issued a badge and allowed to enter our site:
  - 10 hours of OSHA training
  - Security 050, Initial Security Briefing
  - 01065 ES&H specification training
  - Contract-Specific Safety Plan training
- The contracting company's official must sign the badge request to certify that this training is complete
- Additional training may be required, depending on specific job requirements (radiation hazards, beryllium, etc.)

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Construction Safety Initiatives
Work Site Observations

- On-site inspectors conduct daily work site observations to ensure contract compliance
  - Safety
  - Quality
  - Code compliance
- Inspectors and other observers conduct Behavior Based Safety observations at least four times per month
- Early identification of problems leads to early intervention; if necessary, work is stopped and assessed, and changes are implemented
- Leads to operational excellence

Construction Safety Initiatives

Using ES&H Performance as a Criterion for Contractor Selection

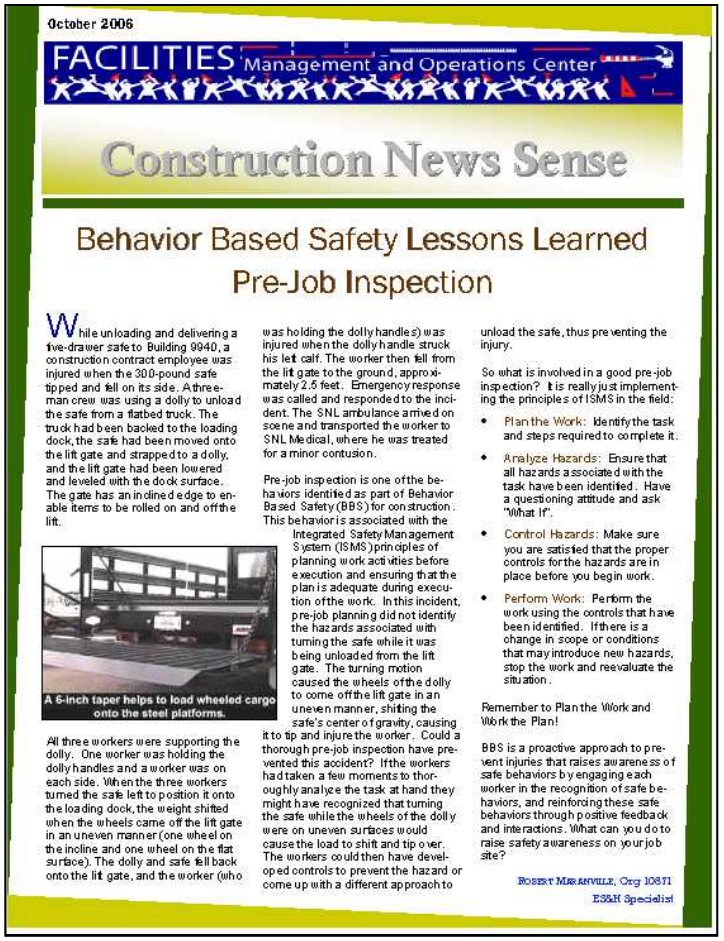
- Implemented formal SCORE system to track contractor historical performance (including ES&H) on past Sandia projects for use in contract award evaluations
- Contractor's ES&H and construction safety program are part of criteria for awarding contracts (up to 30% of best value score)
- Contractor is asked to identify and describe:
  - Construction safety program
  - Safety management policies, processes, and procedures
- Safety incentive/disincentive measures included in contracts

Construction Safety Initiatives

Tracking and Trending of Contractor Performance

- Developing an application that will capture data by contractor in a single database for tracking, trending, and evaluating contractor performance
- Currently, data resides in multiple databases and requires manual preparation of reports
- New application will include information for the following, including corrective actions that will be tracked until completion:
  - Field observations
  - Non-compliance
  - Safety Stars
  - Injury data
  - Occurrence data

Other Safety Efforts



October 2006

FACILITIES Management and Operations Center

Construction News Sense

Behavior Based Safety Lessons Learned
Pre-Job Inspection

While unloading and delivering a five-drawer safe to Building 9940, a construction contract employee was injured when the 300-pound safe tipped and fell on its side. A three-man crew was using a dolly to unload the safe from a flatbed truck. The truck had been backed to the loading dock, the safe had been moved onto the lift gate and strapped to a dolly, and the lift gate had been lowered and leveled with the dock surface. The gate has an inclined edge to enable items to be rolled on and off the lift.

A 6-inch taper helps to load wheeled cargo onto the steel platforms.

All three workers were supporting the dolly. One worker was holding the dolly handles and a worker was on each side. When the three workers turned the safe left to position it onto the loading dock, the weight shifted when the wheels came off the lift gate in an uneven manner (one wheel on the incline and one wheel on the flat surface). The dolly and safe fell back onto the lift gate, and the worker (who was holding the dolly handles) was injured when the dolly handle struck his left calf. The worker then fell from the lift gate to the ground, approximately 2.5 feet. Emergency response was called and responded to the incident. The SNL ambulance arrived on scene and transported the worker to SNL Medical, where he was treated for a minor contusion.

Pre-job inspection is one of the behaviors identified as part of Behavior Based Safety (BBS) for construction. This behavior is associated with the Integrated Safety Management System (ISMS) principles of planning work activities before execution and ensuring that the plan is adequate during execution of the work. In this incident, pre-job planning did not identify the hazards associated with turning the safe while it was being unloaded from the lift gate. The turning motion caused the wheels of the dolly to come off the lift gate in an uneven manner, shifting the safe's center of gravity, causing it to tip and injure the worker. Could a thorough pre-job inspection have prevented this accident? If the workers had taken a few moments to thoroughly analyze the task at hand they might have recognized that turning the safe while the wheels of the dolly were on uneven surfaces would cause the load to shift and tip over. The workers could then have developed controls to prevent the hazard or come up with a different approach to unload the safe, thus preventing the injury.

So what is involved in a good pre-job inspection? It is really just implementing the principles of ISMS in the field:

- Plan the Work: Identify the task and steps required to complete it.
- Analyze Hazards: Ensure that all hazards associated with the task have been identified. Have a questioning attitude and ask "What If".
- Control Hazards: Make sure you are satisfied that the proper controls for the hazards are in place before you begin work.
- Perform Work: Perform the work using the controls that have been identified. If there is a change in scope or conditions that may introduce new hazards, stop the work and reevaluate the situation.

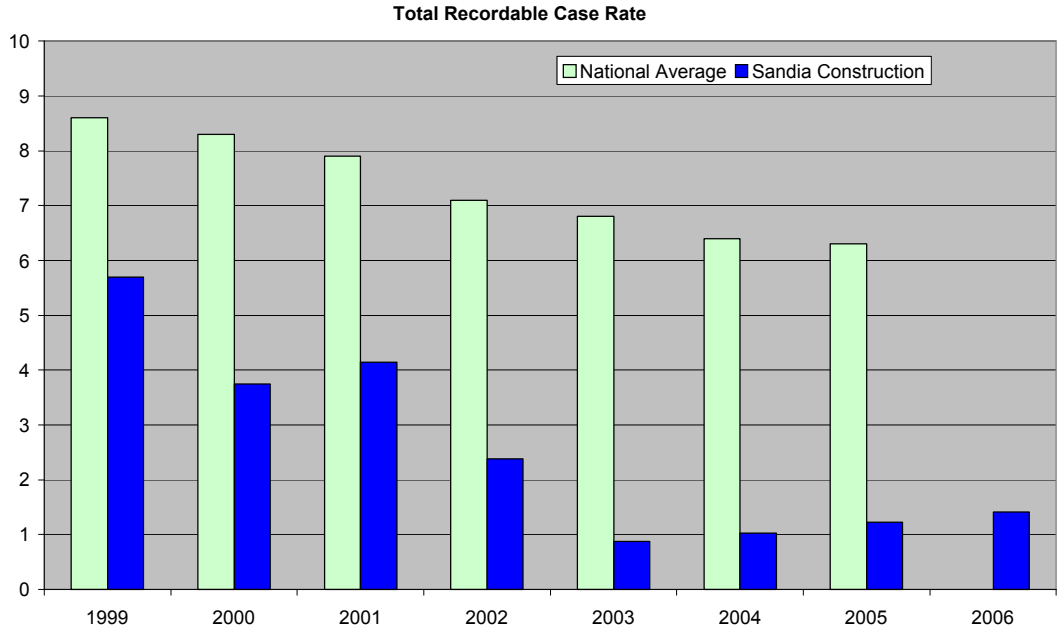
Remember to Plan the Work and Work the Plan!

BBS is a proactive approach to prevent injuries that raises awareness of safe behaviors by engaging each worker in the recognition of safe behaviors, and reinforcing these safe behaviors through positive feedback and interactions. What can you do to raise safety awareness on your job site?

ROBERT MARANVILLE, Org 10871
ES&H Specialist

- Integrating Human Performance Improvement (HPI) features into safety program
- *Construction News Sense*, monthly newsletter for construction contractors
- Quarterly Construction Safety Seminars, started in FY03 to share lessons learned and Sandia site-specific information
- Construction Contractor Safety Deficiency Process, issued for 01065 Specification and OSHA Violations and non-adherence to Contractor's Safety Plan
- Construction Contractor Safety Star Process to recognize outstanding safety performance

Results—Safety Rate Trend



- Facilities Construction Contractor Accident/ Incident Rate is approximately 22% of the national average:
  - Facilities recordable injuries rate for FY06 is approximately 1.41
  - National Average Accident/Incident Rate for Construction in 2005 was 6.3 (most current data)
  - State of New Mexico Total Recordable Case Rate (TRCR) for 2004 was 5.2 (2005 data not yet available)

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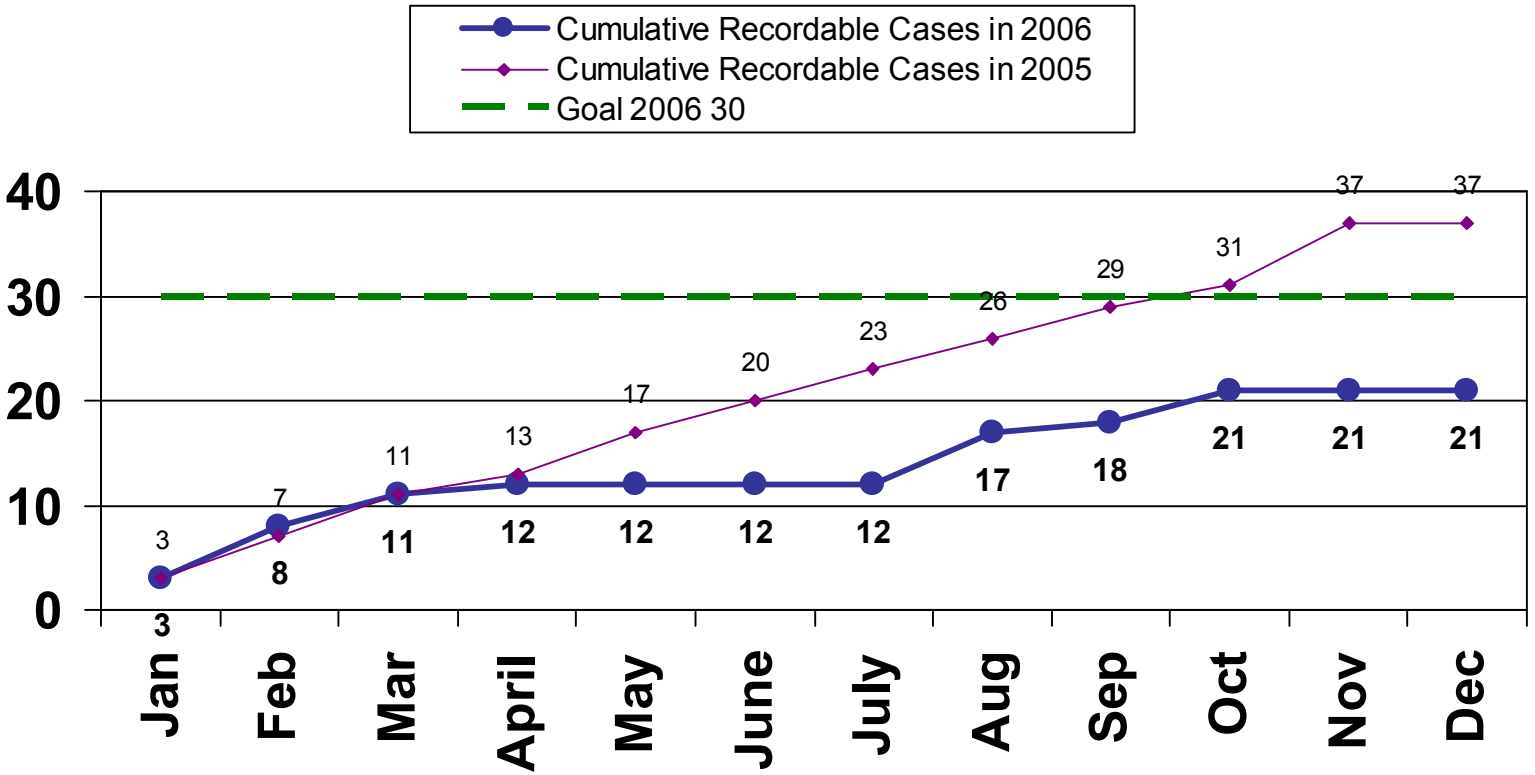
Center 10800 CY06 Cumulative Recordable Cases



Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

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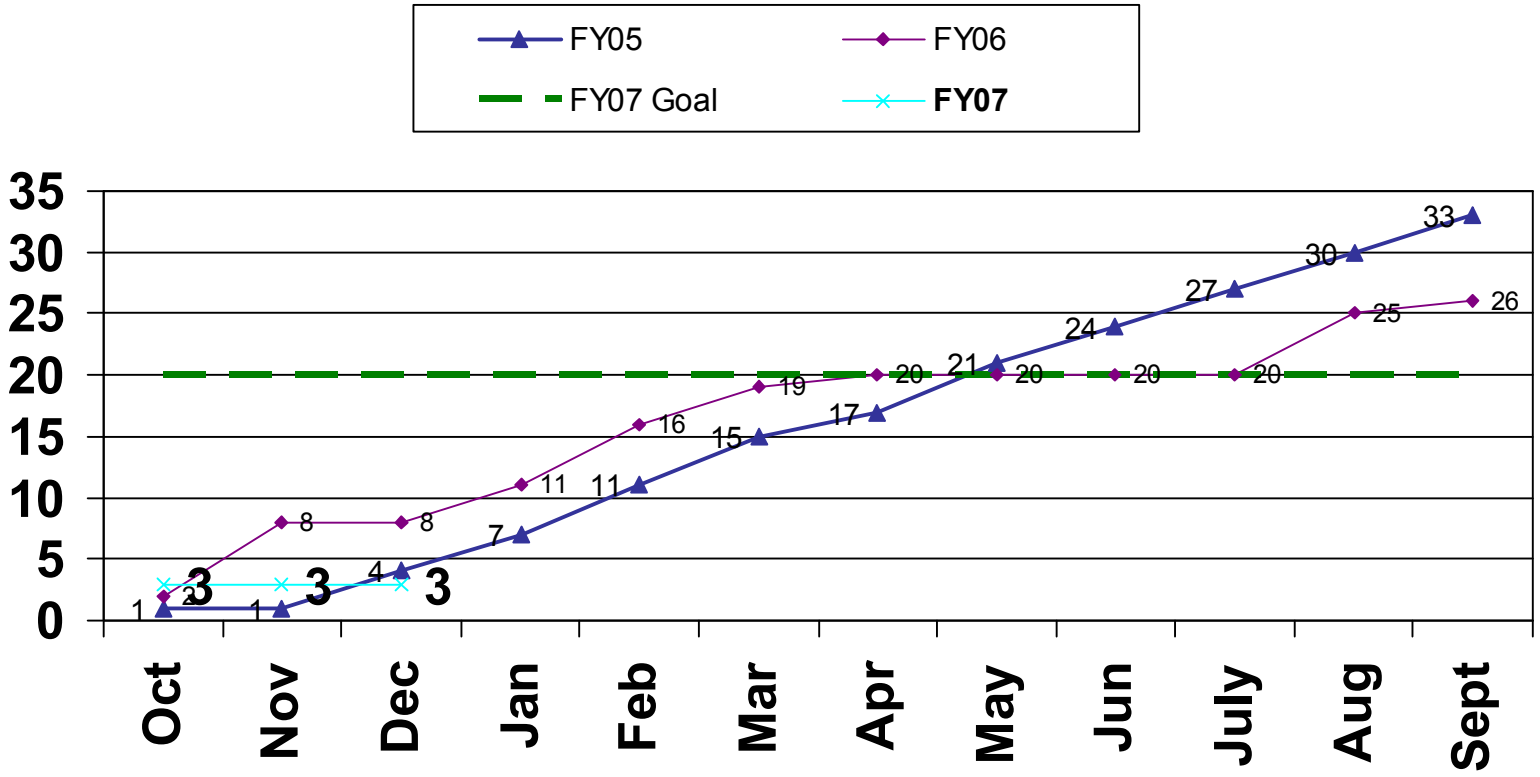
Center 10800 FY06 Cumulative Recordable Cases, cont.



Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

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Center 10800 FY07 Safety Statistics

	FY2006	FY2007*	FY2007 Goals
Hours Worked	816,713	182,916	
Total Recordable Injuries	26	3	
Total Recordable Case Rate	6.37	3.28	4.60
Days Away Cases	4	0	
Days Away	13	0	
Days Away Case Rate	.98	0	.74

***Through December 31, 2006**

Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

Center 10800 FY07 Safety Statistics

Top Causes	FY2006	FY2007*
Slip/Trip/Fall	5	1
Awkward Posture/ Twisting/ Bending	3	
Struck by/Against	2	
Lifting/Carrying/Moving	8	2
Repetitive Trauma/Motion	3	
Other	6	

***Through December 19, 2006**

Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

Center 10800 FY07 Total Recordable Cases by Labor Category

	FY2006	FY2007*
Total Injuries (456 people)	26	3
Custodial (82)	12	1
Craft (152)	12	2
Field Tech Support (179)	2	
Office (43)	0	

***Through December 19, 2006**

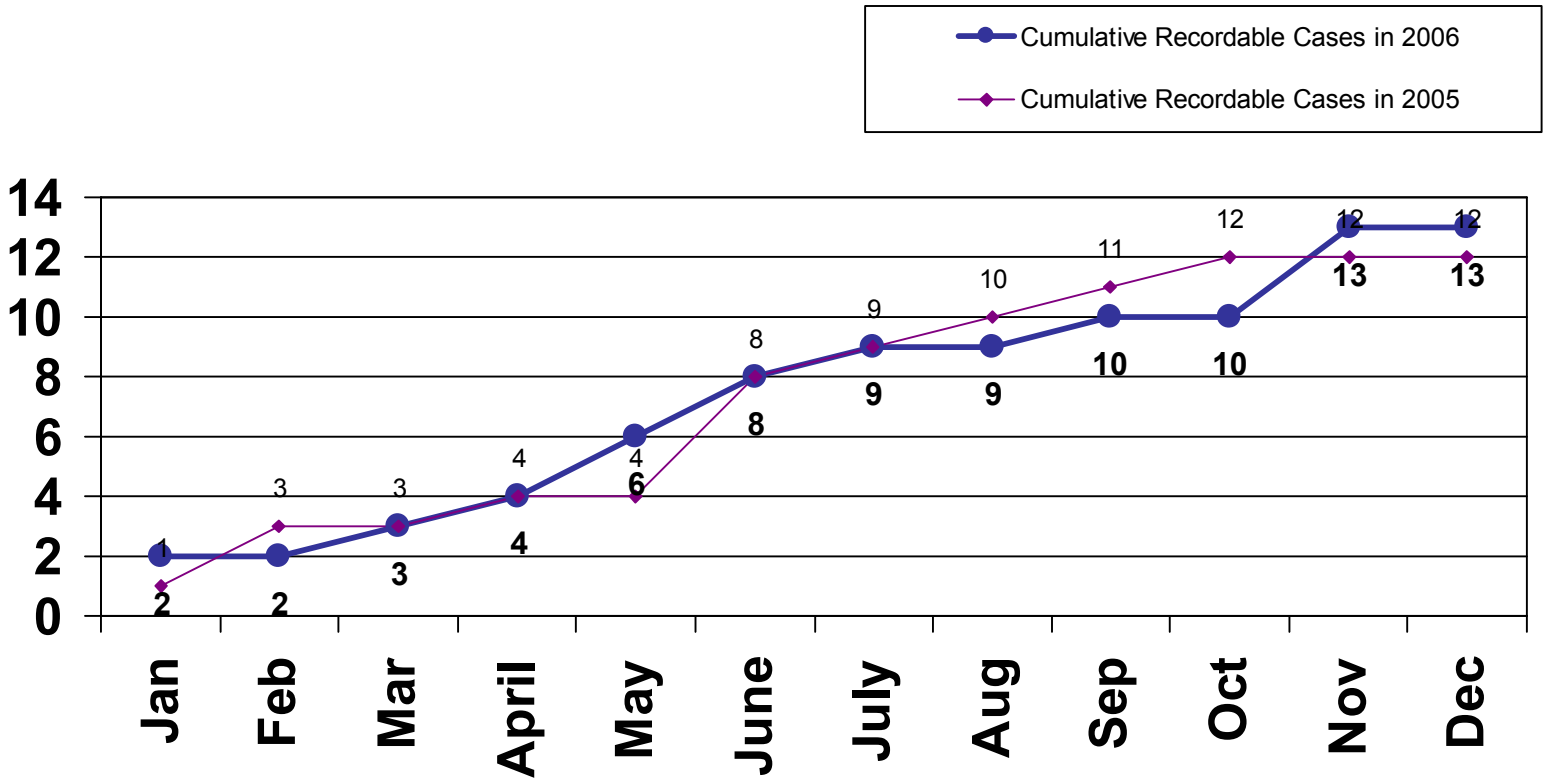
Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

Center 10800 CY06 FMOC Contractor Safety Statistics

Top Causes	CY2005	CY2006*
Fall – from Height	1	
Twisting/Pushing/Pulling	1	
Struck by/Against	3	3
Lifting/Carrying/Moving	2	2
Caught between objects	3	4
Other	3	5

Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

Center 10800 CY06 Construction Contractor Cumulative Recordable Cases



Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

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Center 10800 CY06 Construction Contractor Safety Statistics

	CY2005	CY2006*
Hours Worked	2,154,468	1,443,624
Total Recordable Injuries	12	13
Total Recordable Case Rate	1.11	1.80
Days Away Cases	4	1
Days Away	127	14
Days Away Case Rate	0.37	0.14

***Through December 2006 (only partial hours)**

Owner: Jeff Quintenz **Presented:** Monthly **Type:** ES&H Report

Holiday Shutdown

- Sandia shuts down every year from Christmas to January 2
- Significant maintenance work is planned during each shutdown – we logged more than 7,000 manhours without an injury

- Record 12-inch snowfall hit the site on December 30; the resulting enormous effort to clear the site's 206 acres of roads and walkways – enough snow to fill an American football field 150 feet high – was accomplished with no injuries

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