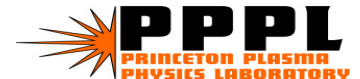


Princeton Plasma Physics Laboratory Safety Program

Description & Progress

DOE-SC Televideo Conference
June 21, 2006

J. W. Anderson, Jr.
Head, ES&H and Infrastructure Support Department

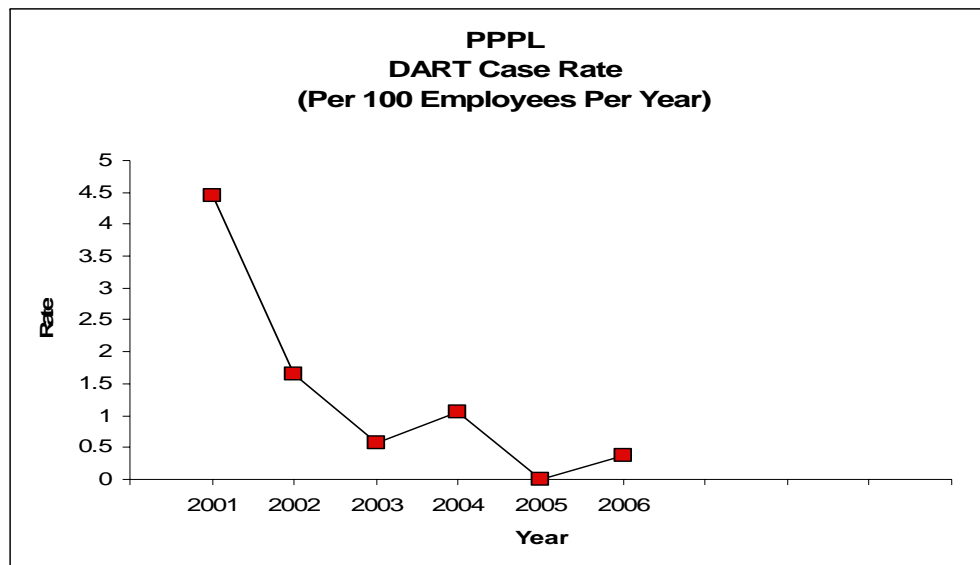


Discussion Topics

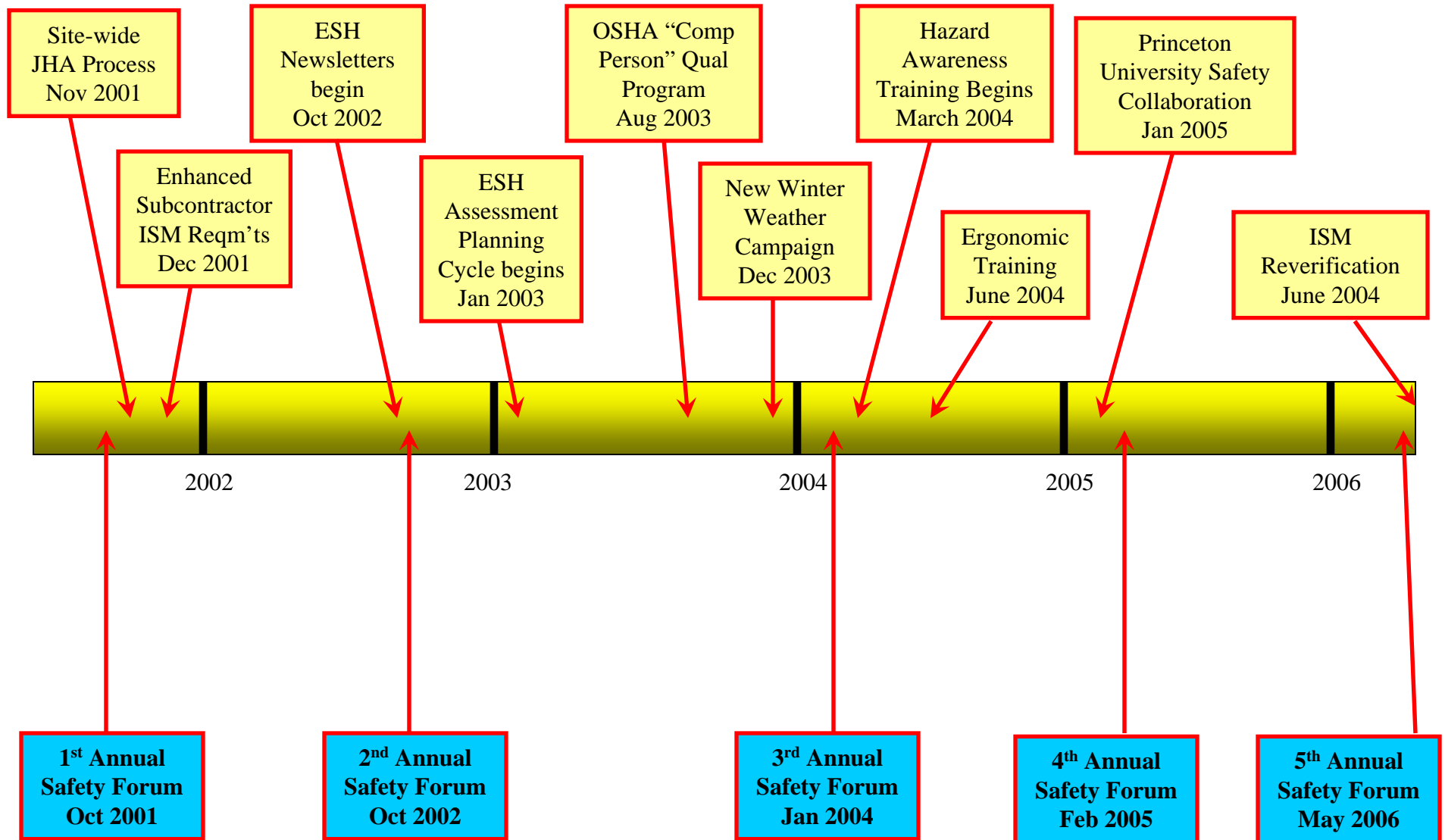
- Trends
- Chronology of Major Initiatives
- Details on Specific Practices
- Future Opportunities

Outcomes Have Improved

	2001	2005
RECORDABLE INJURY & ILLNESS CASES	33	3
DAYS AWAY & RESTRICTED (DART) CASES	28	0
DAYS AWAY FROM WORK	201	0
DAYS WITH WORK RESTRICTIONS	814	0



Evolutionary Improvement



Key Practices

1. Safety Forums

Safety Forums have proven to be valuable opportunities to talk about safety issues and expectations and obtain feedback on ways to improve the safety program and our work habits.



Key Practices

2. Oversight/Assessment Planning

Integrated ES&H Assessment Plan for the Princeton Plasma Physics Laboratory – FY2005			
PROGRAMS to Assess			
PROGRAM	Assessments	Who	When
Elements of programs (to consider during assessment scheduling)	[Audit / Inspection / Surveillance / Self-assessment / External review / Mini-review / USR / Peer review / Other]	(PPPL, PSO, Joint, Other)	
	<i>(Indicate the types of reviews to be conducted)</i>		
Construction Safety ESHG Section-1 ENG-021 "Hoisting and Rigging Program" Rev.2 ENG-024 "Digging Permits" Rev. 2 ENG-028 "Penetration Cutting/Drilling" Rev.0 Safety Review Committee Charter, Rev. 4 P-038 - Control of Hazardous Energy Sources Rev. 0 P-041 - Suspect Parts Rev. 2 P-045 -Working on Rotating Equipment Rev. 1	QA Audit 0506 Hazard Identification and Mitigation	PPPL QA Lead	Nov 2004
	Inspection / Surveillance - NCSX Test Cell Preparation work	PPPL ES&H (M. Lumia, W. Slavin)	Ongoing work
	USR or Mini review of a GPP project in planning stages just prior to commencement. Assess ES&H planning and readiness.	PSO / PPPL joint assessment (L. Dietrich Lead)	Jun 2005
Electrical Safety ESHG Section-2 [Isolation of Hazards, Personnel-Safety-Interlock Systems, Capacitors and Capacitor Banks, Electrical Conductors and Connectors, Enclosures for Electrical Equipment, Inductors and Electromagnets, Instrumentation and Control Systems, Power Supplies, Resistors] ENG-011 "Interlock Key Control" Rev. 2 Electrical Safety Subcommittee Charter, Rev. 0 P-009 - Electrical Isolation During Emergencies Rev. 0 TCR-P-046-001 - Cable Tagging and Removal Rev. 0 P-049 - Authorization for Work on Electrical Systems Rev. 1	Status Assessment of Engineering Interlock Safety and Key Control System [follow-up to the DOE-PSO/PPPL USR on Interlock Safety & Kirk Key Control, performed by R. Borusovic and A. Wrigley April 2004]	PSO Mini-review (A. Wrigley Lead)	Apr 2005
	USR of Small Experimental Projects on C-Site	PSO lead (D. Niemenski) w/PPPL	Dec 2004
	Lab-wide ES&H review in response to SLAC accident investigation report	Lab-wide review	Jan 2005

An annual assessment plan is developed jointly between PPPL and DOE.

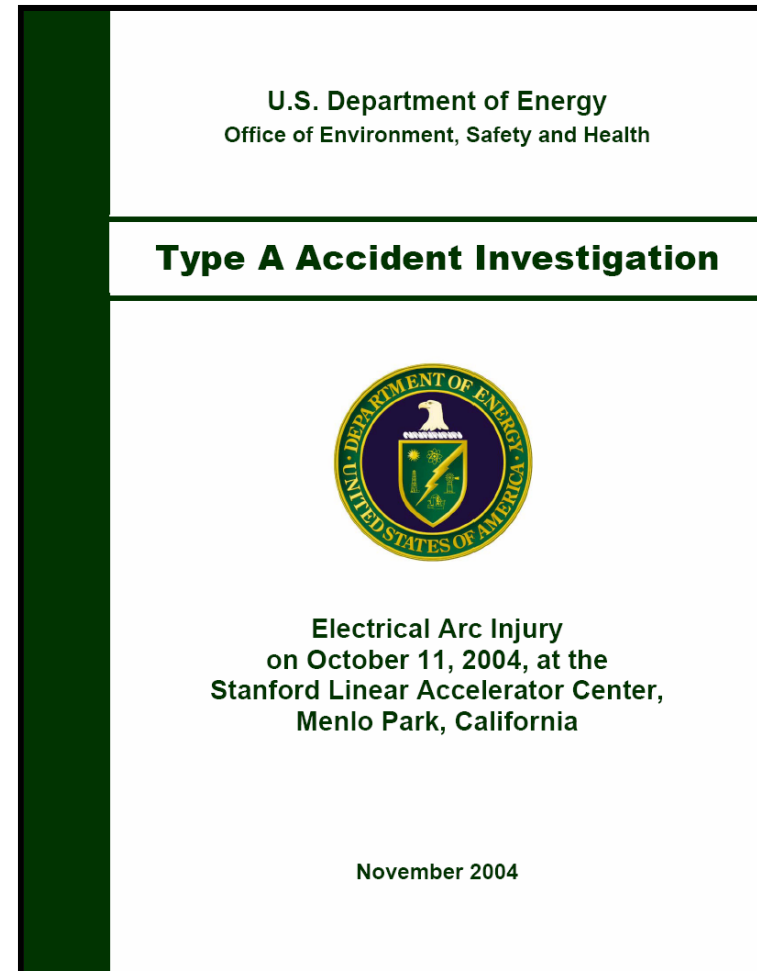
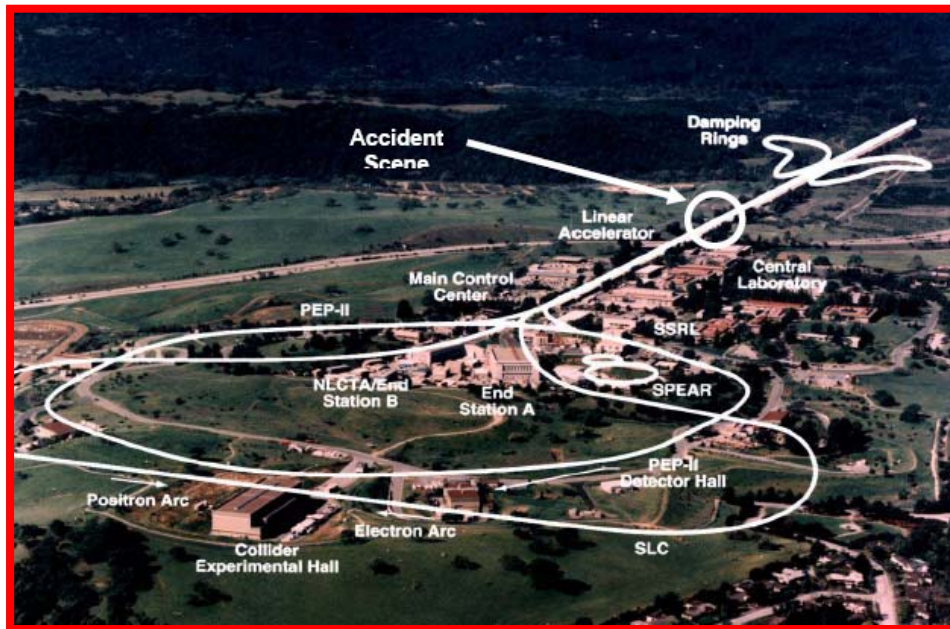
Assessment Plans consider internal as well as external issues.

Results are reviewed at the end of the year.

Key Practices

3. Lessons Learned

We continually look to learn from our own lessons as well as from incidents/accidents taking place at other facilities.



Key Practices

4. Hazard Awareness & Analysis

The Hazard Awareness training course involves classroom training and field exercises.



Over 90% of the staff has taken advantage of this training.

JOB HAZARD ANALYSIS		
Reference: Work Order # _____ Work Permit # _____ Work Planning # _____ Procedure # _____ Other _____		
Written by (Print): _____ Date: _____ Division/Branch/Org: _____ <i>Writer must inform affected workers of hazards and controls on the JHA prior to commencement of work.</i> <input type="checkbox"/> Pre-Job Brief		
Description & Location (Room/Building) of job/work to be performed:		
Hazard (Check-off and Describe the source of the hazard)	Control Measures (Write # of Control(s) in Box)	See Back
<input type="checkbox"/> Chemicals ^a	<input type="checkbox"/> MSDS's Available <input type="checkbox"/> Training Provided	
<input type="checkbox"/> Ergonomic Issues (Repetitive Motion, Lifting, Physical Stresses, etc.) ^b	<input type="checkbox"/> Contact IH for briefing	
<input type="checkbox"/> Ionizing Radiation [Health Physics-HP]	<input type="checkbox"/> Radiation Work Permit (RWP)	
<input type="checkbox"/> Non-Ionizing Radiation (Lasers, Magnetic Fields (EMF), RF, etc.)	<input type="checkbox"/> Contact IH for high power lasers/EMF/RF	
<input type="checkbox"/> Environmental Impacts (Causing Environmental Release, Creating Hazardous Wastes, etc.) [M&ES]	<input type="checkbox"/> Contact M&ES for guidance	
<input type="checkbox"/> Noise ^c		
<input type="checkbox"/> Sharp objects/tools ^d		
<input type="checkbox"/> Working Surfaces / Tripping Hazards ^e		
<input type="checkbox"/> Falls / Elevated Work ^f		
<input type="checkbox"/> Ladders / scaffolds / manlifts	<input type="checkbox"/> Inspection	
<input type="checkbox"/> Cranes / rigging / Forklifts	<input type="checkbox"/> Trained Qualified Personnel	
<input type="checkbox"/> Welding / cutting / grinding / open flame	<input type="checkbox"/> Hot Work Permit [ESU]	
<input type="checkbox"/> Impairing a Security / Fire System [ESU]	<input type="checkbox"/> Contact Security	
<input type="checkbox"/> Hot Surfaces / Cryogenics		
<input type="checkbox"/> Heat or Cold Stress ^g		
<input type="checkbox"/> Steam		
<input type="checkbox"/> Electrical ^h [Electrical Safety]	<input type="checkbox"/> Lockout/Tagout <input type="checkbox"/> Arc Flash Analysis ^h <input type="checkbox"/> GFCI	
<input type="checkbox"/> Confined Space / Oxygen Deficiency	<input type="checkbox"/> Confined Space Permit	
<input type="checkbox"/> Machinery / Machine tools	<input type="checkbox"/> Machine Guards <input type="checkbox"/> Chip Guards	
<input type="checkbox"/> Hand Tools / Power Tools ⁱ	<input type="checkbox"/> GFCI	
<input type="checkbox"/> Eye Hazards ^j		
<input type="checkbox"/> Falling Objects		
<input type="checkbox"/> Potential / Stored Energy ^k		
<input type="checkbox"/> Foot Hazard		
<input type="checkbox"/> Trenching / Digging	<input type="checkbox"/> Digging Permit	
<input type="checkbox"/> Wall / Floor Penetrations	<input type="checkbox"/> Penetration Permit	
For questions about these topics, contact Industrial Hygiene (IH) except where noted in [brackets]. IH = 2533, 2531, 96546, 639. HP = 2311, 2315. M&ES = 3380. ESU/Security = 2536. Electrical Safety = 3740		

Key Practices

5. Identifying and Using “Competent Persons”

1926.354	Welding, cutting, and heating in way of preservative coatings.	and increase in length." "Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a Competent Person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity."	Robert Keilbach Robert Keilbach is the PPPL CP for performing this flammability test.
1926.404	Wiring design and protection	"Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees.... The employer shall designate one or more Competent Persons (as defined in 1926.32(f)) to implement the program."	Rich Borusovic Rich Borusovic is the PPPL CP to assure compliance with 1926.404. (NOTE: PPPL uses GFCI's so does not need a grounding program.)
1926.451	Scaffolds.	Numerous requirements for the Competent Person to approve activities associated with erecting, using and dismantling scaffolds, including inspections for visible defects by a Competent Person before each work shift, and after any occurrence which could affect a scaffold's structural integrity. Also, "the employer shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold <u>trained by a Competent Person</u> to recognize any hazards associated with the work in question." A " Competent Person " for the purposes of this provision (scaffolds) must have had specific training in and be knowledgeable about the structural integrity of scaffolds and the degree of maintenance needed to maintain them. The Competent Person must also be able to evaluate the effects of occurrences such as a dropped load, or a truck backing into a support leg that could damage a scaffold. In addition, the Competent Person must be knowledgeable about the requirements of this (scaffold) standard. A Competent Person must have training or knowledge in these areas in order to identify and correct hazards encountered in scaffold work.	Erik Perry, Bill Slavin Erik Perry and Bill Slavin are the CPs for the Program, and must do the initial inspection of a newly erected scaffold and inspections after any occurrence that could affect a scaffold's structural integrity. Each user must be a CP to perform inspections for visible defects before each work shift (requires taking PPPL scaffold safety course). Subcontractors should supply their own CP and the PPPL Program CP will survey the work.
1926.502	Fall protection systems criteria and practices	"The implementation of the fall protection plan shall be under the supervision of a Competent Person ." "The employer shall designate a Competent Person to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements: The safety:	Bill Slavin Bill Slavin is the PPPL "safety monitor"

“Competent Persons” are our qualified experts designated to fulfill specific accountabilities required by OSHA

Key Practices

6. Sharing Resources

- **“Fresh eyes” are being applied to our performance and practices by strengthening ties with Princeton University.**
 - **Princeton University now participates on the PPPL “ES&H Executive Board”**
 - **PPPL participates on the Princeton University “Environment, Safety and Risk Management Committee”**
 - **PPPL participates on the Princeton University “Radiation Safety Committee”**

The Future

1. Offsite Research

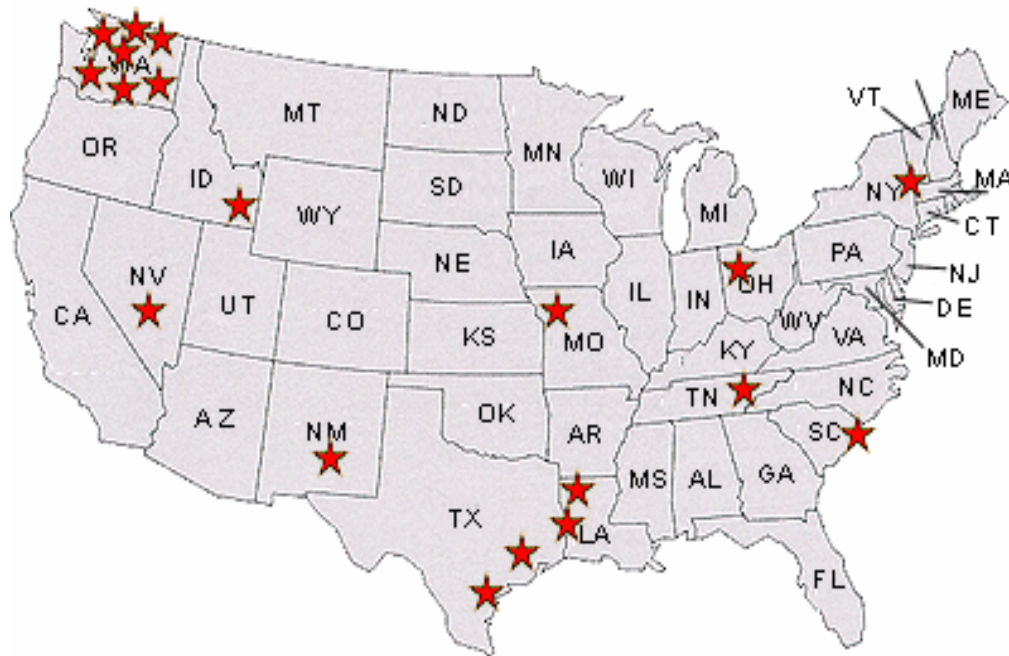
The safety of staff traveling to remote research facilities has taken on increased importance.



We're working to apply selected aspects of the PPPL safety protocols (e.g., line management responsibility, Job Hazard Analysis, specialized training, etc.) to these situations.

The Future

2. The Next Step in Pursuit of Excellence “Voluntary Protection”



We believe participation in the structure of the VPP Process will improve our program and performance.

Process is challenging but can be rewarding

However, our application has been slowed by a couple of other external initiatives.

The Future

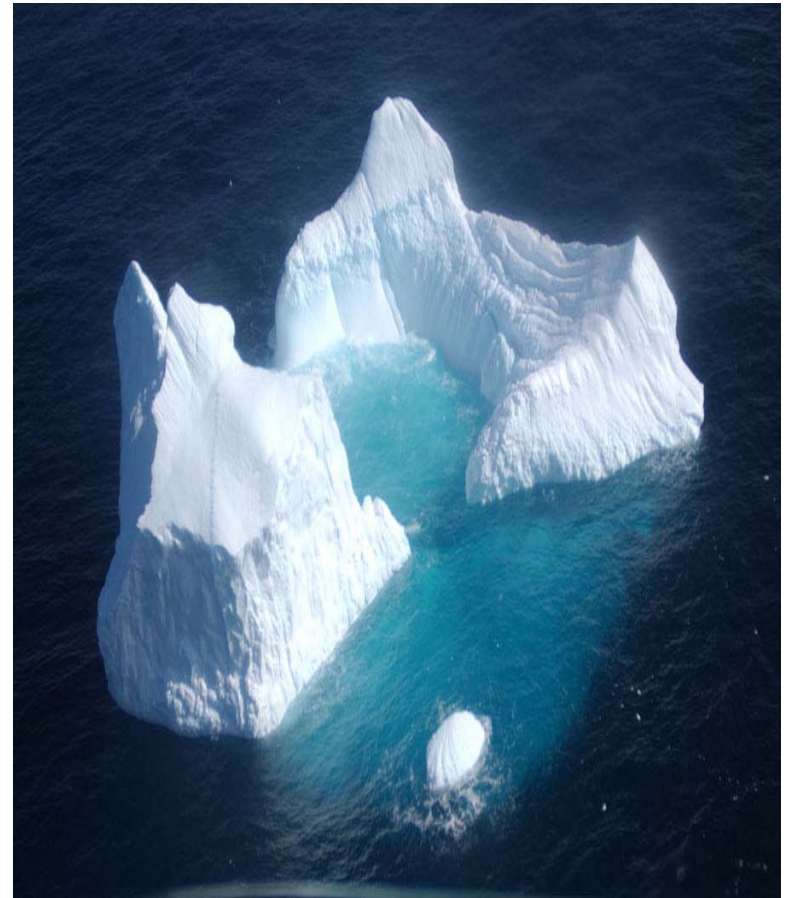
3. Enhanced Assurance Systems

- **DOE Order O 226.1 “Implementation of Department of Energy Oversight Policy”**
 - *More comprehensive system for contractor assurance program description by September 15, 2006.*
 - *Enhanced trending program just underway*
- **Worker Safety Rule (10CFR851)**
 - *Gap analysis*
 - *Program description*
 - *Additional resources*

The Future

4. Moving from 'Reaction' to 'Prevention'

- With outcomes reduced to small numbers, it's time for us to look for what's "beneath the surface".
- We're working on the development of *leading indicators* to identify the positive and proactive things being done to build and sustain a strong correlation to safe performance.



Conclusion

Safety at PPPL is a “Life Long Learning” (L³) Process

- The changes over the last few years have been evolutionary with improvements building upon lessons learned, both from our own experience and from others.
- We’re beginning to believe that an *accident-free workplace* is indeed possible.

