Ames Laboratory Environment, Safety, Health, and Assurance (ESH&A)

Fiscal Year 2011 Trend Analysis
October 11, 2011

Trend Analysis is performed to determine common occurrences or prevailing events that should be addressed with additional inspections, training, reviews, policies, etc. The following sources of information were reviewed for trend analysis from FY2007 to FY2011:

- Employee Safety and Security Concerns
- Independent Walk-Through Findings
- Program / Department Walk-Through Findings
- Walk-About (Walk-Throughs exterior to buildings) Findings
- Discrepancy Reports
- Injury and Illness Data
- Event Reporting (including potentially reportable events, Topical Appraisals and Issues and DOE / External Reviews)
- Causal Factors

Employee Safety and Security Concerns

As indicated in the following table below, there was a 20% decrease in the total number of Employee Safety and Security Concerns from the 4-year average. The Ames Laboratory actively promotes that employee safety and security concerns be brought to the attention of ESH&A. The types of concerns recorded in FY2011include:

- A fire sprinkler line was drained and there was an adverse odor to occupants near the activity. Concern was a lack of communication from Facilities Services when they are going to perform activities that may have an impact on researchers and administrative personnel.
- A question was asked during the Wilhelm Access Control Project when the FNPA 704 door signs in would be replaced.
- An employee observed a technician in Spedding with a laptop computer connected to HVAC equipment that was not escorted and was worried about security.
- The east Spedding entrance was not functional. There was a concern that emergency responders would be delayed in the event of an emergency.
- Concrete cracks due to settling of were observed at the north entrance to Wilhelm. Concern of potential tripping hazard. Concrete patch was applied until the landing could be replaced.
- A sword (ornamental) was observed in an office. Occupant was asked to remove it from premises and complied.
- Concern of radon exposure in Hach Hall. There are floors in the basement that are not finished. The concern was forwarded to ISU ES&H.

	Employee Safety and Security Concerns						
Category	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**4-Year Average**	**FY 2011**	**% Change from 4-Year Average**
Administrative	0	0	0	3	.75	1	33% Increase
Chemical Spills	0	1	0	0	.25	0	Decrease
Fire Safety	0	0	1	0	.25	2	700% Increase
General Safety	3	2	1	6	3	2	33% Decrease

Industrial Hygiene	2	0	1	3	1.50	0	Decrease
Environmental	1	0	0	2	.75	0	Decrease
Security	1	1	1	0	.75	1	33% Increase
Radiological	0	0	0	0	0	1	Increase
Traffic Safety	0	0	0	0	0	0	None
Property Management	0	1	0	1	.50	0	Decrease
Other (non-safety)	0	0	0	0	0	0	None
Odors	3	1	0	0	1.25	0	Decrease
Total Concerns	**10**	**6**	**4**	**15**	**8.75**	**7**	**20% Decrease**

Independent Walk-Through Findings

Ames Laboratory continues to experience a gradual reduction of findings identified during Independent Walk-Throughs (24% decrease from the 4-year average), as indicated in the table below. As in years past, some of the findings most likely would not be cited by OSHA. Often times, the Walk-Through Team will identify concerns as a "best management practices" and such concerns are elevated to a moderate level to ensure it is tracked and closed. The OSHA regulations are intended to be a basic minimum for compliance, and the expectation of Ames Laboratory and the Walk-Through Team exceeds the requirements of OSHA. The Laboratory is striving to be a "Best in Class" facility and issues are identified and corrected to ensure best practices are promoted. The severity of the findings overall has been minimal. No High Hazard Findings have been identified since June 2003.

There continues to be a high level of participation with the Ames Site Office Representative, a member of the Executive Council, Purchasing and Property Services Manager, and an ISU EH&S Representative.

Although there have been increases in some categories of findings by percentage, the actual total number of findings in those specific categories is insignificant. The increase in property management findings is due to the participation of the Purchasing and Property Services Manager identifying unused / obsolete equipment in the laboratories.

The Independent Walk-Through Program has proven to be an effective tool to educate, promote, and measure compliance within the facility.

Independent Walk-Through Findings							
Categories	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**4-Year Average**	**FY 2011**	**% Change from 4-Year Average**
Admin. Controls	1	0	1	0	.5	2	300% Increase
Comp. Gases	4	10	10	5	7.25	5	31% Decrease
Confined Space Entry	0	0	0	0	0	0	None
Electrical Safety	44	64	54	45	51.75	39	25% Decrease
Emergency Planning	2	3	2	1	2	2	Same
Environmental	21	15	11	15	15.5	6	61% Decrease
Fire Safety	2	8	6	9	6.25	1	84% Decrease
General Safety	68	65	46	29	52	35	33% Decrease
Hoisting & Rigging	0	0	0	0	0	0	None
Hazard Communication	2	3	2	1	2	1	50% Decrease
Industrial Hygiene	13	10	23	36	20.5	21	2% Increase
Infrastructure	0	0	0	0	0	1	Increase
Ladder Safety	1	0	1	2	.50	0	Decrease

Independent Walk-Through Findings							
Categories	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**4-Year Average**	**FY 2011**	**% Change from 4-Year Average**
Laser Safety	0	0	0	1	.25	0	Decrease
Life Safety Code	4	5	5	2	4	2	50% Decrease
Lockout/Tagout	1	0	0	0	.25	0	Decrease
Machine Guarding	6	2	5	1	3.5	1	71% Decrease
Other	2	0	0	0	.50	0	Decrease
PPE	3	2	6	4	3.75	5	33% Increase
Plumbing	1	0	0	0	.25	0	Decrease
Procedural	0	0	1	0	.25	0	Decrease
Property Management	5	4	1	3	3.25	13	300% Increase
Radiation	1	1	0	0	.5	0	Decrease
Respiratory	4	5	1	3	3.25	1	69% Decrease
Training	0	0	0	0	0	0	None
Totals	**185**	**197**	**175**	**157**	**178.5**	**135**	**24% Decrease**
Noteworthy Practices	2	0	0	0	.50	0	Decrease

Program / Department Walk-Through Findings

The information collected from the programs / departments is requested in percentage (not the total number of findings). Specific comparisons (number of findings), cannot be made to the Independent Walk-Through Findings, but general observations on the type of concerns identified can be ascertained. The largest category observed was "General Safety" and the second largest category was "Electrical" concerns. This is consistent with the Independent Walk-Through Program. No major concerns are apparent.

Walkabout (Walk-Through exterior to buildings) Findings

Walkabouts (building roofs, yards, sidewalks, exterior doors and windows) have been performed annually since 2005. The most recent Walkabout was performed September 30, 2011. The goal of the Walk-About is to identify potential safety hazards and violations that are not identified during the Independent Walk-Through Program. Hazards such as deviations in concrete for walking and working surfaces, proper operation of Ground Fault Circuit Interrupters, secure handrails on stairs, proper signs are posted for hazards, emergency exits are maintained, etc. No High Hazard Findings have been identified to date. As with the Independent Walk-Throughs, some of the findings would not be cited by OSHA. The findings would be categorized as best management practices. The Walkabout provide a great opportunity to identify other areas of concern such as deteriorating infrastructure such as dried or missing caulking on windows, ground erosion, removal of unplanned bushes and trees, concerns to be monitored for future walkabouts, etc.

Year	Concerns
2007	9
2008	7
2009	5
2010	9
2011	6

Discrepancy Reports

Discrepancy reports are issued by the Plant Protection staff during facility tours. The total discrepancies have decreased 46% from the previous 4-year average. The organization(s) responsible for the discrepancies are notified via Plant Protection / ESH&A for follow-up and correction. Most notable in FY 2011 is the decrease in coffee pots being left on (65% decrease) and fume hoods being put into set-

back and sashes lowered (42%) when not in use. Both categories were an emphasis for FY 2011. Coffee drinkers were asked to purchase coffee makers with automatic shut offs. This has been very effective.

Fume hood users are made aware a fume hood was not placed in setback and sash not lowered by stickers applied to the hood glass and an email sent to group leader. By placing the fume hood in setback and lowering the sash, Facilities Services estimates that simple action could save up to $1100 per hood in energy savings. The stickers, developed by the Environmental Specialist, were presented to Facilities Services Managers during the Mission Readiness Review. Overwhelmingly, the managers requested a sticker to take back to their facilities for incorporation into their programs.

No concerns are apparent.

Discrepancy Reports							
Category	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**4-Year Average**	**FY 2011**	**% Change from 4-Year Average**
Coffee Pots On & Hot	83	72	68	49	68	24	65% Decrease
Soldering Pen/Iron on & hot	3	9	10	6	7	2	71% Decrease
Unsecured Gas Cylinder	18	19	11	21	17.25	13	25% Decrease
Natural Gas Valve On	19	15	9	8	12.75	7	45% Decrease
Main Cylinder Valve Open	14	22	14	16	16.50	5	70% Decrease
Uncapped Cylinder	12	25	16	8	15.25	8	48% Decrease
Unattended Flame	4	3	1	1	2.25	1	56% Decrease
Obstructed Hallway / Door	15	3	12	15	11.25	12	7% Increase
Unsecured Door	87	86	96	84	88.25	54	39% Decrease
Hood Sash / Set Back *(New Category -2007 Emphasis)*	64	232	249	105	162.5	95	42% Decrease
Improper / Incompatible Storage	8	7	7	2	6	6	Same
Obvious Equipment Malfunction	13	13	19	7	13	4	69% Decrease
Window Open	7	5	8	6	6.5	3	54% Decrease
Miscellaneous	54	57	46	32	47.25	24	49% Decrease
Total Discrepancies	**401**	**568**	**567**	**360**	**474**	**258**	**46% Decrease**

Injury and Illness Data

There was a 60% increase of total injuries / illnesses and a 243% increase of OSHA Recordable injuries and illnesses (those requiring medical attention beyond first aid). There were six OSHA Recordable injuries, one of which resulted in 28 Lost Work Days (LWDs) and another that resulted in 6 Restricted Work Days (RWDs). The OSHA Recordable, LWDs, and RWDs are as follows:

1. Lumbar strain - lifting a motor (6 Restricted Work Days)
2. Laceration to forearm - cutting sheet metal
3. Fall down stairs at ISU Parks Library (28 Lost Work Days)
4. Laceration to left finger - drilling aluminum plate, not clamped, and it spun
5. Subungal hematoma to big toe - sliding cabinet door came out of track
6. Laceration of right finger - contact with lathe tooling

The Laboratory continues to stress safety/accident prevention in General Employee Training, line management responsibility for safety, distribution of lessons learned, the circulation of Safety Guides, the use of personal protective equipment, and safety training. In addition, the Laboratory Director continues

to send Laboratory-wide safety messages stressing the importance of safety and the expectation for all employees to maintain a safe and healthful workplace.

Injury and Illness Data							
Type of Injury / Illness	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**4-Year Average**	**FY 2011**	**% Change from 4-Year Average**
Contusion / Abrasions	2	0	1	1	1	2	100% Increase
Burns	0	0	0	1	.25	2	700% Increase
Chemical Exposure	0	0	0	0	0	2	Increase
Eye Injury	0	0	1	0	.25	0	Decrease
Fracture	0	0	1 (1)	0	.25	1 (1)	300% Increase
Laceration	6 (2)	2	4 (2)	0	3	3 (3)	Same
Puncture	1	0	0	0	.25	0	Decrease
Acute Musculoskeletal Injury	2	1 (1)	0	2 (1)	1.25	1 (1)	20% Decrease
Miscellaneous:							
Hematoma	0	0	0	0	0	1 (1)	Increase
Respiratory Irritant	1	0	0	0	.25	0	Decrease
Twisted Ankle	0	1	0	0	.25	0	Decrease
Avulsion (toenail)	0	0	1	0	.25	0	Decrease
Bee Sting	0	0	1	0	.25	0	Decrease
Splinter	0	0	0	1	0	0	Increase
Total	**12**	**4**	**9**	**5**	**7.5**	**12**	**60% Increase**
OSHA Recordable	2	1	3	2	2	6	200% Increase
Non-OSHA Recordable	10	3	6	3	5.25	6	14% Increase
Lost Work Days –LWD	0	2	2	0	1	28	2700% Increase
Restricted Work Days – RWD	0	18	0	12	6.25	6	4% Decrease
Total of LWD and RWD	0	20	2	12	8.5	34	300% Increase
DART Case Rate	0	.23	.2	.22	0.1625	.45	177% Increase
Total Recordable Case Rate (TRCR)	0.48	.23	.68	.44	.46	1.34	191% Increase

( ) indicates OSHA Recordable Injury DART = Days Away, Restricted, and/or Transferred

Event Categorization (FY)

The Laboratory utilizes information from a broad variety of sources to determine events which are reviewed against external and local reporting criteria. The sources include concerns, injuries and illnesses, assessment results and operational data. Event reporting information is presented in the following three tables: Event Reporting Summary, Reportable Events, and Ames Local Events. The following are the events categorized in FY 2011:

Event ID	Date	Event Description	Categorization
E10-001	1-14-10	Water Leak, A02 ZAF 1-14-10	Ames Local-ORPS
E10-002	1-27-10	HF Alarm	Not Reportable (ORPS, NTS, ISC or Local)
E10-003	1-29-10	Type 1 Low System Compromise	Ames Local-ISC
E10-004	2-03-10	Type 1 Low System Compromise	Ames Local-ISC
E10-005	2-12-10	Type 1 Low System Compromise	Ames Local-ISC
E10-006	2-16-10	Smoke- Chromium Residue	Ames Local-ORPS
E10-007	2-15-09	Minor Contusion	Ames Local-CAIRS
E10-008	2-23-10	Minor Chemical Burn	Ames Local-CAIRS
E10-009	3-06-10	Electrical Shutdown in HWH	Ames Local-ORPS
E10-010	3-10-10	Type 1 Moderate Cyber Issue	Ames Local- ISC
E10-011	3-10-10	Minor Thermal Burn	Ames Local-CAIRS

Event ID	Date	Event Description	Categorization
E10-012	3-24-10	Minor Laceration	Ames Local-CAIRS
E10-013	3-18-10	Type 1 Low System Compromise	Ames Local-ISC
E10-014	3-22-10	Type 1 Low System Compromise	Ames Local-ISC
E10-015	3-23-10	Type 1 Low System Compromise	Ames Local-ISC
E10-016	3-26-10	Type 1 Low System Compromise	Ames Local-ISC
E10-017	3-31-10	Type 1 Low System Compromise	Ames Local-ISC
E10-018	4-06-10	Type 1 Low System Compromise	Ames Local-ISC
E10-019	4-07-10	Type 1 Low System Compromise	Ames Local-ISC
E10-020	4-13-10	Type 1 Low System Compromise	Ames Local-ISC
E10-021	4-13-09	Type 1 Low System Compromise	Ames Local-ISC
E10-022	4-13-10	Splinter in Thumb	Ames Local-CAIRS
E10-023	4-15-10	Scheduled Power Outage Issue	Ames Local-ORPS
E10-024	4-16-10	Type 1 Low System Compromise	Ames Local-ISC
E10-025	5-11-10	Smoke from Elevator Oil Heater in HWH	Ames Local-ORPS
E10-026	4-28-10	Type 1 Low System Compromise	Ames Local-ISC
E10-027	6-3-10	Employee Ill after Blood Donation	Not Reportable (ORPS, NTS, ISC or Local)
E10-028	**6-8-10**	**Dropped UPS at Wilhelm Dock**	**ORPS and CAIRS SC—AMSO-AMES-AMES-2010-0001**
E10-029	6-9-10	HF Scrubber Malfunction	Ames Local-ORPS
E10-030	**6-18-10**	**Rad and Beryllium Contamination Discovery 6-18-10**	**ORPS Report SC-AMSO-AMES-AMES-2010-0002**
E10-031	6-14-10	Zaffarano Power Outage and Water Leak	Ames Local-ORPS
E10-032	4-28-10	Type 1 Low System Compromise	Ames Local-ISC
E10-033	6-27-10	Water Detection, ZAF	Not Reportable (ORPS, NTS, ISC or Local)
E10-034	7-01-10	Researcher Locked in HWH Office	Ames Local-ORPS
E10-035	7-16-10	Laser Safety Review and Radiation Protection Review By DOE 7/12-15/10	Ames Local-NTS Laser = 5 Findings(2 still due) Rad = 4 Findings(3 still due)
E10-036	7-19-10	HEPA Unit Inspection Tags	Ames Local-NTS
E10-037	7-19-10	Fire in HEPA Air Scrubber	Ames Local-NTS
E10-038	8-04-10	Bulk Solvent mix-up	Ames Local- ORPS
E10-039	8-11-10	Flood, Water Loss	Ames Local-ORPS
E10-040	8-17-10	Floor tile burnt- B11 SPH	Ames Local-ORPS
E10-041	8-17-10	Water service leak- CWH-PAC	Ames Local-ORPS
E10-042	8-17-10	Muffle furnace fire- 180 DEV	Ames Local- ORPS
E10-043	8-31-10	Vacuum Pump Fire	Ames Local-ORPS
E10-044	**8-27-10**	**Contractor Injury (Hernia)**	**CAIRS**
E10-045	8-31-10	Bicep Strain	Ames Local - CAIRS
E10-046	9-3-10	Intrusion	Ames Local-ISC
E10-047	9-28-10	Person trapped in HWH Elevator	Ames Local –ORPS
E10-048	9-28-10	Confined Space Entry- Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-049	9-28-10	Lab Coat – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-050	9-28-10	Nanoscale Materials – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-051	9-28-10	X-ray Safety Program – Topical Appraisal	Ames Local - ORPS
E10-052	9-28-10	Radiological Personnel Monitoring Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-053	9-29-10	Laser Safety – Topical Appraisal	Ames Local – ORPS
E10-054	9-29-10	Waste Management Contingency – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-055	9-29-10	Waste Contractor Performance – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-056	9-30-10	Vulnerability Scan Management – Topical Appraisal	Ames Local - ISC
E10-057	9-30-10	ISU Employee Injury	Not Reportable (ORPS, NTS, ISC or Local)
E10-058	9-30-10	Type 1 Low System Compromise	Ames Local-ISC
E10-059	9-30-10	Type 1 Low System Compromise	Ames Local-ISC
E10-060	9-30-10	Type 1 Low System Compromise	Ames Local-ISC
E10-061	9-30-10	Type 1 Low System Compromise	Ames Local-ISC
E10-062	9-30-10	Type 1 Low System Compromise	Ames Local-ISC
E10-063	9-30-10	Hot Work – Topical Appraisal	Ames Local – ORPS
E10-064	9-30-10	NFPA 704 Postings – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)

Event ID	Date	Event Description	Categorization
E10-065	9-30-10	Needs Assessment Process – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-066	9-30-10	Event Categorization Process – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E10-067	10-8-10	Type 1 Low System Compromise	Ames Local-ISC
E10-068	10-8-10	Type 1 Low System Compromise	Ames Local-ISC
E10-069	10-8-10	Type 1 Low System Compromise	Ames Local-ISC
E10-070	10-11-10	Person trapped in HWH elevator	Ames Local – ORPS
E10-071	10-13-10	Vacuum Pump Fire 120 DEV	Ames Local – ORPS
E10-072	11-10-10	HWH Fire Alarm 11-05-10	Ames Local – ORPS
E10-073	11-10-10	Slip/Fall in ZAFF 09-28-10	Not Reportable (ORPS, NTS, ISC or Local)
E10-074	**11-10-10**	**Back Injury 11-8-10**	**CAIRS**
E10-075	11-10-10	Thumb Injury, 317 SPH	Ames Local – ORPS
E10-076	11-12-10	Quality Assurance Audit (Welding and Cutting) 8-12-10	Ames Local –ORPS
E10-077	**12-10-10**	**Forearm Laceration**	**CAIRS**
E11-001	**1-3-11**	**Broken arm and ankle, and dislocated elbow.**	**CAIRS and ORPS SC-AMSO-AMES-AMES-2011-0001**
E11-002	1-3-11	Missing Laptop	Not Reportable (ORPS, NTS, ISC or Local)
E11-003	**1-6-11**	**Head Injury**	**ORPS Recurring SC-AMSO-AMES-AMES-2011-0002**
E11-004	1-7-11	Ambulance Call	Not Reportable (ORPS, NTS, ISC or Local)
E11-005	1-10-10	Ambulance Call	Not Reportable (ORPS, NTS, ISC or Local)
E11-006	1-12-11	Heat Detector Activation	Not Reportable (ORPS, NTS, ISC or Local)
E11-007	1-28-11	Type 1 Low System Compromise	Ames Local-ISC
E11-008	1-28-11	Type 1 Low System Compromise	Ames Local-ISC
E11-009	2-4-11	Exterior Doors Unlocked (communications between C-Cure and Internal Server)	Ames Local - ISC
E11-010	2-7-11	Exterior Doors Unlocked (permanent license # inserted)	Ames Local - ISC
E11-011	2-10-11	Exterior Doors Unlocked (while troubleshooting – 2 controllers did not operate)	Ames Local - ISC
E11-012	3-9-11	Environmental Compliance Review	Ames Local – ORPS
E11-013	3-18-11	Recalled First Aid Supplies	Ames Local-ORPS
E11-014	3-29-11	Type 1 Low System Compromise Rogue.FakeRean trojan	Ames Local-ISC
E11-015	3-29-11	Type 1 Low System Compromise Trojan.Anamika	Ames Local-ISC
E11-016	4-1-11	Radiation Contaminated Metal Stamps	Ames Local - NTS
E11-017	3-4-11	Electronics Management – Topical Appraisal	Ames Local – ORPS
E11-018	4-6-11	Evacuation Map – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E11-019	4-12-11	Recycling Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E11-020	4-28-11	Type 1 Low System Compromise Gymsations phishing	Ames Local-ISC
E11-021	5-05-11	Suspicious behavior reported	Not Reportable (ORPS, NTS, ISC or Local)
E11-022	5-06-11	Type 1 Low System Compromise Web Site Defacement	Ames Local-ISC
E11-023	5-11-11	"All Page" failed to page	Ames Local – ORPS
E11-024	5-18-11	Small Chemical Spill 334 HWH	Ames Local – ORPS
E11-025	5-19-11	ES&H Reporting Assessment By AMSO	Ames Local – ORPS
E11-026	5-19-11	Electrical Safety Assessment By AMSO	Ames Local – ORPS
E11-027	**5-19-11**	**Finger Laceration**	**CAIRS**
E11-028	5-24-11	Type 1 Low System Compromise Phishing exploit	Ames Local-ISC
E11-029	5-24-11	Type 1 Low System Compromise Phishing attempt	Ames Local-ISC
E11-030	**5-24-11**	**Toe Contusion**	**CAIRS**
E11-031	5-27-11	Historical Be Lessons Learned overlooked	Ames Local-ORPS
E11-032	**6-8-11**	**Lacerated Right Index Finger**	**CAIRS**
E11-033	12-2-10	EBEAM Instruments Cost Reduction Review	Not Reportable (ORPS, NTS, ISC or Local)
E11-034	3-24-11	American Recovery and Reinvestment Act Review	Not Reportable (ORPS, NTS, ISC or Local)
E11-035	6-13-11	Review of Costs Incurred for Allowability	Not Reportable (ORPS, NTS, ISC or Local)

Event ID	Date	Event Description	Categorization
E11-036	6-28-11	Napolitano computers & monitor theft 3304-2 Gilman, 6-28-11	Ames Local-ISC
E11-037	7-7-11	Type 1 Low System Compromise Trojan exploit	Ames Local-ISC
E11-038	7-7-11	Type 1 Low System Compromise Fakeware exploit	Ames Local-ISC
E11-039	7-7-11	Type 1 Low System Compromise Phishing exploit	Ames Local-ISC
E11-040	7-14-11	Three missing assets	Not Reportable (ORPS, NTS, ISC or Local)
E11-041	7-15-11	Minor burns, three fingers	Ames Local-ORPS
E11-042	7-18-11	FSG Vehicle Damaged	Ames Local-ORPS
E11-043	7-18-11	Personal Vehicle Damage, Possibly Due To Safety Fence	Ames Local-ORPS
E11-044	8-11-11	Possible metal fume exposure 8-9-11	Ames Local-ORPS
E11-045	8-11-11	Contaminated debris discovered at shed demolition	Not Reportable (ORPS, NTS, ISC or Local)
E11-046	8-12-11	MC&A Review 2011	Ames Local-NTS
E11-047	8-12-11	Report of missing HF cylinder during incoming shipment	Not Reportable (ORPS, NTS, ISC or Local)
E11-048	8-12-11	Report of possible door break-in attempt	Ames Local-ISC
E11-049	8-15-11	160 SPH Fire Alarm	Ames Local-ORPS
E11-050	8-25-11	Financial Statement Review Internal Audit- 8-03-11	Not Reportable (ORPS, NTS, ISC or Local)
E11-051	8-29-11	Possible door break-in attempt	Ames Local-ISC
E11-052	8-22-11	Nitric acid burn to right elbow	Ames Local - CAIRS
E11-053	9-6-11	Shipment of Thorium Crystal Bar held by FEDEX	Not Reportable (ORPS, NTS, ISC or Local)
E11-054	9-7-11	Quality Assurance Assessment (Welding and Cutting)	Ames Local-ORPS
E11-055	**9-12-11**	**Electrical Conduit Cut by Subcontractor**	**ORPS SC-AMSO-AMES-AMES-2011-0003**
E11-056	9-22-11	NFPA110- Generator Systems – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E11-057	9-22-11	Confined Space Entry Program - Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E11-058	9-19-11	Dimethyl Sulfoxide Exposure (drop)	Ames Local - CAIRS
E11-059	9-28-11	Mission Readiness Peer Review July 26/28 2011	Ames Local-ORPS
E11-060	9-28-11	Accountability Protocol – Topical Appraisal	Ames Local-ORPS
E11-061	9-15-11	Nano Scale Materials – Topical Appraisal	Not Reportable (ORPS, NTS, ISC or Local)
E11-062	9-15-11	Posting and Labeling for Radiation Protection – Topical Appraisal	AMES Local - ORPS
E11-063	9-30-11	System Imaging – Topical Appraisal	Ames Local - ISC
E11--064	9-28-11	Electronic Records Management – Topical Appraisal	AMES Local - ORPS
E11-065	9-15-11	Beryllium Worker Registry – Topical Appraisal	Ames – Local – ORPS
E11-066	8-18-11	Safeguards and Security Survey – DOE / External Review	Ames Local - ISC
E11-067	9-29-11	Integrated Safety Management – DOE / External Review	Not Reportable (ORPS, NTS, ISC or Local)
E11-068	9-29-11	Emergency Management Program Review – DOE /External Review	Ames Local - ORPS
E11-069	9-29-11	Untimely Departure of Researcher or Key Employee – Topical Appraisal	Ames Local – ORPS
E11-070	9-28-11	Establishment of Background Levels for Lab Buildings - Topical Appraisal	Ames Local – ORPS

Event Reporting (FY)

As indicated in the summary tables (below), there were three (3) incidents reported to the Occurrence Reporting Processing System (ORPS) and six (6) incidents reported into the Computerized Accident / Incident Reporting System (CAIRS). One of the reportable events was categorized as both and ORPS and a CAIRS; this event was the employee who fell down the stairs. An ORPS is required to be reported if there is a bone fracture. It was categorized in ORPS under 2A(6)(b), any single occurrence that results in a serious injury that result s in a fracture of any bone. This injury also resulted in 28 lost work days.

Event Reporting Summary (FY)							
Categories	**2007**	**2008**	**2009**	**2010**	**4-Year Average**	**2011**	**% Change from 4-Year Average**
Occurrence Reports (ORPS)	2	4	3 (*)	4 (*)	3.25	3 (*)	8% Decrease
Noncompliance Tracking System (NTS)	0	0	1 (2)	0	.25	0	Decrease
Incidents of Security Concern (ISC)	0	0	0	0	0	0	None
Ames Local (AL)	24	38	54	64	45	55	22% Increase
Accident and Injury (CAIRS)	2	1	3 (*)(#)	2 (*)	2	6 (*)	200% Increase
Other (below reporting threshold)	13	24	20	13	17.5	18	3% Increase
Total Events Screened	41	67	79	83	67.5	81	20% Increase

(* = Combination ORPS / CAIRS)
(# = Combination CAIRS/NTS)

The Reportable Events table below provides specific details on the reportable events since FY2004.

Reportable Events (FY)					
Year	**Type**	**Identification**	**Date**	**Title**	**Description**
FY 2004	ORPS	CH—AMES – Ames-2004-0001	1-29-04	Electrical Contact	Researcher contacts 110 VAC when trying to reduce the clicking noise of an electrical contact / relay within the interlock box.
FY 2005	ORPS	CH—AMES – Ames-2004-0002	12-20-04	Suspect / Counterfeit Bolts	While performing a Readiness Review, suspect / counterfeit bolts (non load bearing) was discovered.
	ORPS	CH—AMES – Ames-2005-0001	2-1-05	Potential High Voltage Exposure	A visiting scientist (not supported by SC Funding) assembled a prototype research system before seeking Readiness Review.
	ORPS	CH—AMES – Ames-2005-0002	4-20-05	Flash Hazard Analysis Accuracy Questioned	During the SC Electrical Safety Review, the consultant questioned the accuracy of the analysis.
	ORPS	CH—AMES – Ames-2005-0003	8-10-05	Software Issue Found in Fire Alarm System	A smoke detector in building alarmed at the fire panel and central station but did not activate the alarms.
FY 2006	ISC	ISC – IMI 3(#19) Incident # 51451	2-17-06	System Intrusion	An intruder allegedly from force.coe.neu.edu used a real username/password to access gateway.cmpgroup.ameslab.gov.
FY 2007	ORPS	CH- - Ames-Ames-2007-0001	12-29-06	Smolder /Smoke in Renovation Area	A small crack in the concrete floor between two buildings allowed a spark from plasma-arc cutting to reach expansion joint material.
	ORPS	CH- - Ames-Ames 2007-0002	7-27-07	Electrical Conduit Penetration	Conduit penetrated by screw during roofing operations.
FY 2008	ORPS	SC - - AMSO-AMES-AMES-2007-0003	10-4-07	Switch Failure – Fire Alarm System	During annual fire alarm system test and fire drill, the Wilhelm Hall over-ride switch failed.

Reportable Events (FY)					
Year	**Type**	**Identification**	**Date**	**Title**	**Description**
	ORPS	SC - - AMSO-AMES-Ames-2008-0001	4-23-08	Suspect /Counterfeit Bolts	After review of a lessons learned, the man-lifts were reviewed with one having suspect/counterfeit bolts.
	ORPS	SC - - AMSO-AMES-Ames-2008-0002	5-16-08	Hydrofluoric Acid SAD Procedure Deviation	A larger cylinder of Hydrofluoric Acid was purchased & installed contrary to the Safety Analysis Document and Standard Operating Procedure.
	ORPS	SC - - AMSO-AMES-Ames-2008-0003	7-3-08	HVAC Vent Unexpectedly Drops	HVAC Upgrade Project a wall vent was not verified that it was removed before removing supply duct.
FY 2009	ORPS & CAIRS	SC - - AMSO-AMES-Ames-2008-0004	10-24-08	Elbow Injury (Fracture)	An Engineer while applying pressure on opposing wrenches dislodged a bone in the elbow from a previous non-work related injury.
	ORPS & NTS	SC - - AMSO – AMES – Ames – 2009-0001	5-18-09	Beryllium Contamination Found	As a result of performing wipe sampling in preparation for a fume hood exhaust stack lining project, beryllium was discovered above the DOE Limits
	ORPS	SC- - AMSO-AMES-Ames – 2009-0002	9-25-09	Water Service Impairment (Fire Safety) at Service Buildings (ARRA)	ARRA funds stimulus money was appropriated to remodel a portion of the Campus warehouse to provide needed space for the storage of record. Subcontractor determined that the 4 inch water service was inadequate for the sprinkler system.
FY 2010	ORPS	SC- - AMSO – AMES – Ames-2009-0003	10-7-09	Electric Shock	While assembling components of the biomass auger reactor, the student received an electric shock. Activity in space leased by Ames Lab by non employee.
	ORPS	SC-AMSO-AMES-Ames-2009-0004	12-1-09	Fire of UPS	Fire was detected involving a UPS System for the Scalable Computing Lab.
	ORPS & CAIRS	SC-AMSO-AMES-Ames-2010-0001	6-8-10	Dropped UPS on Dock	Delivering a (UPS) unit, two Facilities employees dropped it on its side. As the unit fell, one employee jumped out of the way resulting in neck strain that required prescription muscle relaxer and restricted work duty.
	ORPS	SC_AMSO-AMES-Ames-2010-0002	6-18-10	Rad and BE Discovery	Elevated radiological readings were discovered in recessed area at the tops of some of the doors.
	CAIRS	C10-0001	8-27-10	ARRA Contractor Injury (hernia)	While lifting a door frame into place, contractor pain in his groin. Determined to be hernia requiring surgery.
FY 2011	ORPS & CAIRS	SC-AMSO-AMES-Ames-2011-0001	1-3-11	Broken Arm & Ankle and Dislocated Elbow	Employee fell downstairs at ISU Library. Steps in good condition.
	ORPS	SC-AMSO-AMES-Ames-2011-0002 (R)	1-6-11	Recurring Injuries	Custodians falling during floor stripping and waxing activities.
	ORPS	SC-AMSO-AMES-Ames-2011-0003	9-12-11	Cut Conduit	Contractor performing demolition cut into a concealed conduit with 110 VAC.

Causal Factors

As detailed in the following tables and discussion, TapRoot analysis is performed on reportable events and causal analysis process is performed on Ames Local Events.

TapRoot Analysis

TapRoot is a formal (standardized) method used at Ames Laboratory to investigate and determine causal factors for significant events (those beyond Ames Local Events). It is a method that is used by other DOE

facilities. The use of TapRoot at Ames Laboratory began in 2004 for Reportable Events (Occurrences (ORPS), Non Compliance Tracking System (NTS) and Incidents of Security Concern (ISC)). No trends are apparent. Below is a table of the ORPS that received TapRoot analysis.

TapRoot Analysis of Reportable Events		
Event Number	**ORPS Description**	**Causal Analysis**
ORPS – 2004 - 001	Electrical Shock –Group Leader not authorized to remove cover.	A5 – Communication LTA
ORPS – 2004 - 002	Suspect Bolts - Equipment sent from Manufacturer with suspect bolts	A1 – Design / Engineering Problem
ORPS – 2005 - 001	Potential High Voltage Exposure	A3 – Human Performance
ORPS - 2005 - 002	Accuracy of Flash Analysis Questioned	A1 - Design / Equipment Problem
ORPS – 2005 - 003	Fire Alarm Annunciation Failed to Activate	A2 – Equipment / Material Problem
ISC – IMI – 3(#19) #51451	Condensed Matter Physics SSH Incident	A4 – Management Problem
ORPS 2007 - 0001	Smoke – Smoldering Event in Graphics Renovation	A2 – Equipment Problem
ORPS 2007- 0002	Electrical Conduit Penetration at Warehouse	A3 – Human Performance
ORPS 2007 – 0003	Wilhelm Hall Annunciators Did Not Activate During Fire Drill	A2 - Equipment / Material Problem
ORPS 2008 - 0001	Suspect / Counterfeit Parts on Man-lift	A2 – Equipment / Material Problem
ORPS 2008 - 0002	Hydrofluoric Acid Procedure Deviation	A3 – Human Performance
ORPS 2008 - 0003	HVAC Upgrade Project – Wall Vent Fell Onto Desk	A4- Management Problem
ORPS 2008 - 0004 & CAIRS	Elbow Injury (Fracture)	None Deemed Appropriate - Legacy
ORPS 2009 - 0001 and NTS	Beryllium Contamination Found	A7 – Other Problem
ORPS 2009 - 0002	Water Service Impairment (Fire Safety) at Service Buildings	A2 – Equipment / Material Problem
ORPS 2009 - 0003	Electric Shock of non employee in lease space	A4 – Management Problem
ORPS 2009 - 0004	Fire in UPS Unit	A2- Equipment / Material Problem
ORPS 2010 - 0001 and CAIRS	Dropped UPS Unit	A4- Management Problem
ORPS 2010 - 0002	Rad Beryllium Discovery in Tops of Doors	A4 - Management Problem
ORPS 2011 - 0001 & CAIRS	Broken Ankle, Broken Arm, Dislocated Elbow	A3 – Human Performance
ORPS 2011 -0002 (R)	Floor Maintenance Injuries (Recurring)	A4 – Management Problem
ORPS 2011 - 0003	Energized 110 Volt Conduit Cut	A3 - Human Performance

Causal Analysis

Causal Analysis of Ames Local Events started in May of 2004. An Ames Local Event is one which does not meet the threshold of reportability to DOE, but warrants further investigation and potentially the development of corrective actions. The Laboratory also includes non-recordable injuries and illnesses (Ames Local- CAIRS) as an opportunity to ensure incidents are evaluated and potential corrective actions are documented and tracked. Furthermore, Ames Local Events are evaluated for recurrence (trending). Ames Laboratory views the causal analysis (investigation and analysis) program as a proactive opportunity to address concerns and develop corrective actions to prevent minor concerns which could be a precursor to a severe injury and events.

Below are the results of the causal factors identified from all reportable events for FY2007 through FY2011. Overall there has been a 14% decrease in the number of events needing to be categorized. The predominant causal factors identified are "A3-Human Performance LTA" from the DOE Guide 231.1-2. This is consistent with the number generated annual since the beginning of causal analysis in May of 2004. A5-Management Problem" is the second leading causal factor. Although these are the leading causal factors, both have decrease from the 4-year average,

The FY2010 Trend Analysis had a significant increase in A2-Equipment/Material Problem compared to FY2007, 2008, and 2009. These are attributed to the installation of the new electronic access control (3), water leaks with pipes, fire with UPS, vacuum pumps overheating, etc. Corrective actions were developed to appropriately match the identified causal factors.

The increase in events in 2008 was due to adding causal analysis of topical appraisals. This was a proactive effort to provide additional data for further trending.

Causal Factors from Reportable and Ames Local Events (exclude non-reportable events)							
Causal Factor	**FY07**	**FY08**	**FY09**	**FY10**	**4-Year Average**	**FY1**	**% Change from 4-Yr Average**
A1-Design/Engineering Problem	1	1	2	3	1.75	1	**43% Decrease**
A2-Equipment/Material Problem	5	7	6	15	8.25	7	**15% Decrease**
A3-Human Performance LTA	19	13	30	14	19	14	**26% Decrease**
A4-Management Problem	5	19	11	4	9.75	10	**3% Increase**
A5-Communications LTA	0	2	6	4	3	2	**Same**
A6-Training Deficiency	0	2	0	0	.50	2	**300% Increase**
A7- Other Problem (External Phenomena, Radiation/Hazardous Material Problem)	0	0	2	2	1	1	**Same**
Totals	**30**	**44**	**57**	**42**	**43.25**	**37**	**14% Decrease**

Reportable and Ames Local events requiring corrective actions are tracked in the Ames Laboratory Corrective Action Tracking System (ALCATS). In June of 2007, Corrective Action Verification was added to ALCATS. At 6 month and 12 month intervals, the closed events are revisited to ensure corrective actions are addressed adequately. Depending on the corrective actions (development of procedures, policies, guides, etc.), Group Leaders / Department Managers and workers are interviewed to determine the results of the implemented corrective actions. Since this process was initiated, there has been one event for which the corrective actions were deemed to be "Partially Effective" at the 6 month verification (E07-014, 2007 Review of Materials Control and Accountability Program). After the responsible parties were notified and addition corrective actions were put into place, the corrective actions were deemed effective at the 12 month verification.