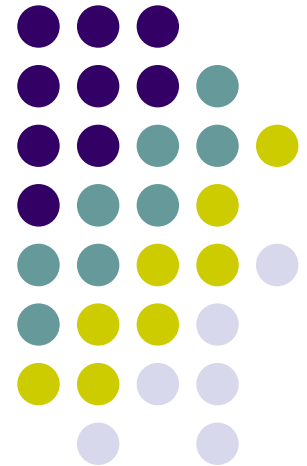
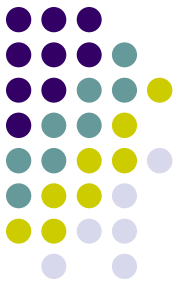


Improving the Level of Informed Risk on Your Campus, Part 2: Loss Control Metrics that Matter

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The University of Texas School of Public Health



Colleges & Universities as Worksettings

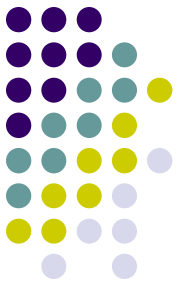


- Very unique places of work due to the potential for simultaneous exposures to all four hazards types
 - Physical
 - Chemical
 - Biological
 - Radiological
- And a diverse “population at risk”
 - Students, faculty, staff, visitors, others

Training Gap

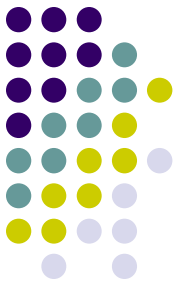


- There are over 4,700 colleges and universities in the U.S.
- Interestingly, none the EH&S professionals who serve them were formally trained on how universities operate
- This lack of understanding results in a lot of frustration and confusion
- Enhanced understanding can improve services and support



Course Objectives

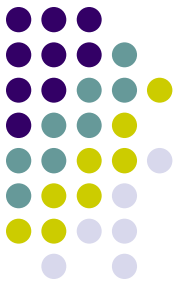
- To begin to articulate the risk control needs of an institution, we first must understand its characteristics
- To accomplish this, we need some basic descriptive institutional data
- such as...



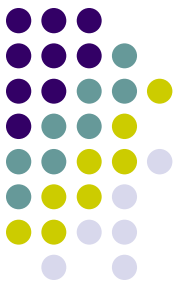
Institutional Measures

- How big is your campus?
- How is size measured?
- What measures are important (e.g. resonate with resource providers?)
- What risks are present?
- How are these risks managed?
- Are these risks real or hypothetical?
- How might you determine that?
- How does management determine that?

Loss Prevention Measures



- How many staff?
- In your opinion, are you over or understaffed?
- How would you know?
- How would others know?
- How are you performing?
- Within the context of the mission of your institution, is your program viewed as hindering or helping?
- How is your program's performance measured?
- In your opinion, are these measures true indicators of performance?
- What do the clients served really think of your program?
- Do clients feel there are real (or perceived) loss prevention program duplications of effort?



Loss Prevention Staffing

- An age old question - How many EH&S staff should I have?
- Perhaps an equally important question is: What can we realistically hope to obtain from a benchmarking exercise involving staffing metrics?
- At best, we can likely only achieve a reasonable estimation of “industry averages”, such as number of EH&S FTE’s for an institution exhibiting certain characteristics

Sampling of Possible Staffing Predictors and Influencing Factors

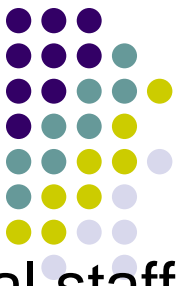


- Quantifiable
 - Institution size
 - Number of labs
 - Level of funding
 - Population
 - Geographic location
 - Deferred maintenance
 - Public/private
 - Medical/Vet schools
 - Disjunct campus
- Non-quantifiable
 - Regulatory history & scrutiny
 - Tolerance of risk by leadership
 - Level of trust/faith in program
 - Ability of EH&S program to articulate needs

Desirable Characteristics of Predictors for Benchmarking



- Consistently quantifiable
- Uniformly defined by a recognized authority
- Easily obtained
- Meaningful and relevant to decision makers (provides necessary context)
- Consider something as simple as the definition of “number of EH&S staff”



Suggested Definition

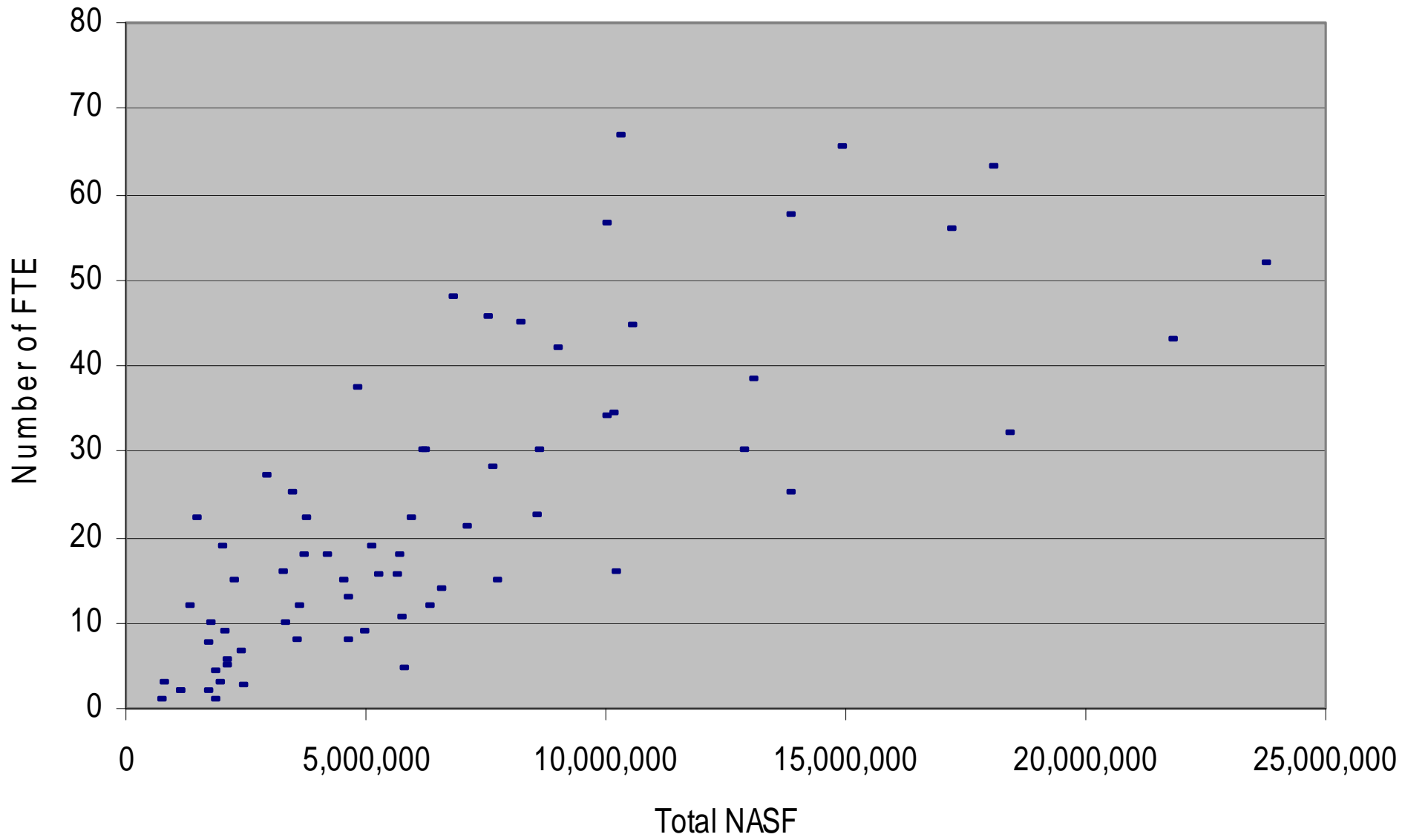
- “EH&S Staff”: technical, managerial, and directorial staff that support the EH&S function
 - Suggest including administrative staff, but it probably doesn’t make a big difference
- Can include staff outside the EH&S unit, but must devote half time or greater to institutional safety function (0.5 FTE)
 - Example
 - Safety person in another department
 - Student workers (>0.5 FTE)
- Contractors included only if on-site time is half time or greater (0.5 FTE)
 - Example –
 - contract lab survey techs, yes if >0.5 FTE
 - Fire detection testing contractors, likely no.

Preliminary Results



- Findings indicated that Total NASF and Lab NASF are the most favorable (statistically significant) and pragmatic predictors
- On a two dimensional graph, we can only show 2 parameters, but the relationship between sq ft and staffing is clear.

Number of EHS FTE vs. Total NASF

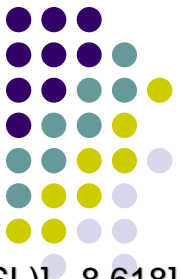


Predictability of Various Models (based on n=69)



Total campus sq ft	Lab + non-lab sq ft	In (total campus sq ft)	In (lab) + In (non lab sq ft)	Med/vet school	General "others" category	BSL3 or impending BSL4	R Squared Value
X							47.69
	X						50.46
		x					64.90
			X				71.10
			x	x			78.19
			x	x	x		78.41
			x	x		x	80.05

Current Metrics Model



$$\# \text{ EH\&S FTE} = e^{[(0.516 * \text{School}) + (0.357 * \ln(\text{Lab NASF})) + (0.398 * \ln(\text{Nonlab NASF})) + (0.371 * \text{BSL})] - 8.618}$$

R² value based on 69 observations = 80%

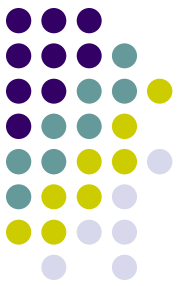
Definitions for predictor variables:

Lab NASF: the number of lab net assignable square footage

Nonlab NASF: the number of non-lab net assigned square footage (usually obtained by subtracting lab from gross)

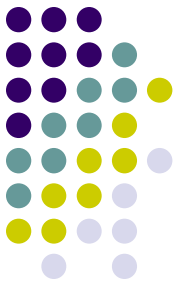
School: defined as whether your institution has a medical school as listed by the AAMC or a veterinary school as listed by the AAVMC; 0 means no, 1 means yes

BSL: this variable indicates if the institution has a BSL3 or BSL4 facility; 0 means no, 1 means yes



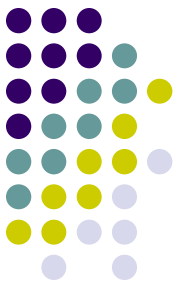
Staffing Predictors

- The data from 69 institutions from across the country indicate that four variables can account for 80% of the variability in EH&S staffing:
 - Non lab net assignable square footage
 - Lab net assignable square footage
 - Presence of Medical or Vet School
 - Existence of BSL-3 operations
- These predictors important because they are recognized and understood by those outside the risk control profession
- With the collection of more data, the precision of the model could likely be improved to the benefit of the entire profession



Forewarning

- Note, even an estimate for the number of EH&S staff doesn't give us any indication about their proficiency and effectiveness
- So what should we be measuring in loss prevention?
- And how should we communicate what loss prevention does?

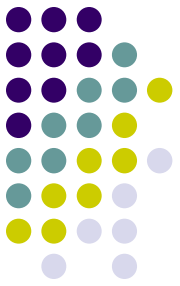


Why Metrics?

“When you measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.”

-William Thomson, Lord Kelvin

Metrics



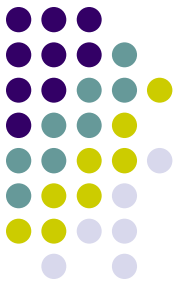
What measures?

What units?

How often to collect the data?

How to communicate the information?

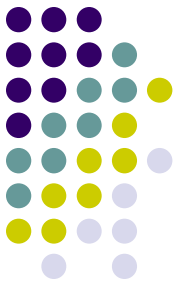
Measures versus Metrics



A metric is a unit of measurement that objectively quantifies an organization's performance

-What's measured gets managed

What Measures?



Losses

Personnel

Property

Compliance

External

Internal

Financial

Expenditures

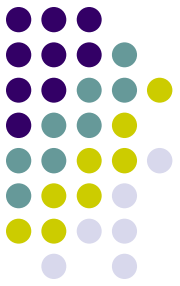
Revenues

Client Satisfaction

External

Internal

Measurements as Indicators



Output - workload

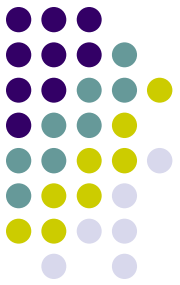
number of individuals trained

surveys or inspections completed

violations assessed

Outcomes – does the program achieve its desired results

is safety training or inspections effective in reducing injury or illnesses



What Units?

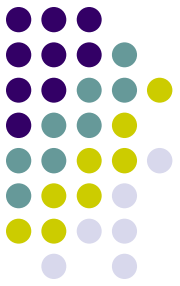
\$ (Cost)

Square feet

Time

Number of events

Physical Safety & Fire Safety



Individuals trained

Inspections

Deficiencies identified and resolved

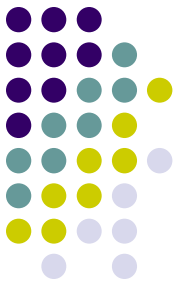
Incident response

Plan reviews

Fire, Life Safety, & Emergency Preparedness Program FY 2006

Description	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Totals
Facility Inspections, Checks, and Surveys													
Portable Fire Extinguishers Checked	779	364	335	780	364	337	636	364	317	635	364	337	5612
Safety Lockers Inspected	0	0	5	0	0	6	0	0	6	0	0	6	23
Life Safety Reviews	12	49	11	18	49	11	29	49	11	29	29	12	309
Lease Space Reviews	0	0	2	2	0	0	2	0	0	0	0	1	7
Hallway Clearance, Egress Checks	12	49	1	13	61	60	2	17	17	15	17	60	324
Safety Showers & Eyewashes Inspected	0	276	0	0	122	47	84	55	121	84	55	120	964
Fire Alarm Related Activities													
New Devices Tested/Devices Accepted	0/0	416/414	2/2	0/0	28/0	1	23/15	14/1058	30/30	12/12	21/21	20/20	567/1573
Fire Alarm Events	10	17	10	6	19	11	6	6	11	10	15	10	131
Trouble Events	3000	724	1250	3758	461	1016	740	1429	744	620	739	862	15343
Fire Drills	1	2	1	2	2	2	3	2	2	2	0	0	19
Annual Electronic Door Closure Tests (c)	2	0	1	0	0	0	0	12	4	0	0	0	19
Annual Fire Alarm Inspections (c)	2	0	3	0	0	3	0	3	2	0	0	2	15
Suppression Related Activities													
Weekly Fire Pump Tests	20	20	20	20	15	25	18	18	15	15	20	13	219
Annual Sprinkler Inspections (c)	1	0	3	0	0	3	0	0	2	0	1	1	11
Special Hazard & Alternative System Inspections (c)	0	0	1	0	5	0	0	0	0	0	1	0	7
Annual Fire Extinguishers Inspected (c)	0	138	20	780	135	219	0	0	31	0	84	0	1407
Quarterly Tamper & Water Flow Inspections (c)	0	4	2	2	4	2	0	2	3	1	2	4	26
Hydrotests	0	3	2	2	2	1	3	0	5	5	4	1	28
New Systems Accepted	0	0	0	1	1	1	0	0	7	1	1	0	12
Construction / Renovation / Facility Related Activities													
Plan Reviews	2	4	2	3	4	12	1	6	14	10	5	3	66
Hot Works Permits Submitted / Inspected	24/5	12/2	30/6	31/7	31/9	30/5	40/6	36/4	37/4	45/12	22/6	25/5	66
Fire Impairment Permits Submitted & Inspected	4	3	2	2	0	3	3	2	2	1	2	0	24
Job Safety Analysis Reviews	1	0	0	0	2	0	1	0	0	2	0	0	6
Site Safety Surveys	5	5	6	8	10	6	15	20	16	20	13	10	134
Asbestos Activities													
Surveys Performed	1	4	2	3	3	1	3	1	3	1	3	7	32
Number Samples	13	0	0	1	1	0	0	0	0	5	0	0	20
Abatement Jobs Managed	1	2	0	2	2	1	0	1	1	1	1	3	15
Amount Abated (ft ²)	8	579	0	2559	17	24	0	0	533	400	600	1000	5720
Training													
Individuals Trained	38	30	41	174	189	87	39	29	47	24	40	34	772
Staff Continuing Education Hours	48	22	18	20	32	36	19	32	5	8	6	32	278

Chemical Safety



Individuals trained

Laboratories inspections

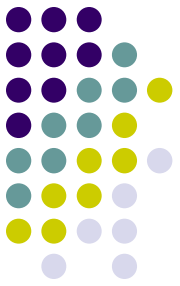
Deficiencies identified and resolved

Incident response to chemical agents

Chemical fume hood verification

Monthly Activity Summary FY 2006													
	September	October	November	December	January	February	March	April	May	June	July	August	Totals
SURVEILLANCE													
Chemical Safety Surveys	164	65	78	86	78	76	170	91	69	38	80	91	1086
Controlled Substances Surveys	2	2	2	2	2	2	2	1	2	1	2	1	21
Total deficiencies noted	29	47	24	34	36	24	38	42	16	20	27	27	364
Deficiencies corrected On-Site	9	8	9	6	9	9	8	7	2	2	4	5	78
Deficiencies to be corrected by PI	12	30	8	25	27	10	27	28	13	13	17	19	229
Deiciencies to be corrected by EH&S	4	6	5	1	0	4	3	5	1	4	4	1	38
Deficiencies to be corrected by Facility Operations	4	3	2	2	0	1	0	2	0	1	2	0	17
Deficiency follow-up surveys	15	17	10	12	4	5	2	10	2	1	7	6	91
Deficiencies found corrected	8	10	6	3	4	5	0	3	2	1	6	3	51
Deficiencies Outstanding	12	29	10	26	23	10	30	32	12	17	17	19	237
OCCUPATIONAL EXPOSURE MONITORING & ASSESSMENT													
Chemical Fume Hood Assessment	26	16	15	19	23	15	20	18	12	5	13	18	200
Indoor Air Quality Monitoring	0	1	1	2	1	0	0	1	1	2	0	1	10
Chemical Exposure Monitoring	0	0	1	1	0	0	0	2	2	0	1	0	7
Other Monitoring (Noise, etc.)	0	1	0	0	0	0	0	0	0	1	0	3	5
TOTAL	26	18	17	22	24	15	20	21	15	8	14	22	222
INCIDENT RESPONSE													
IAQ / Odor Complaints	6	7	8	7	6	4	8	17	22	4	20	13	122
Broken Mercury Thermometer	0	1	1	0	3	0	1	0	0	4	0	1	11
Chemical Spill/Cleanup	1	1	1	0	0	0	2	3	1	2	1	0	12
Others (Injuries, Hood Ventilation, Water Leaks, etc.)	6	2	1	2	2	7	5	3	8	13	0	2	51
TOTAL	13	11	11	9	11	11	16	23	31	23	21	16	196
INVESTIGATION (INJURY/EXPOSURE)													
Suspected Chemical Exposure	0	0	0	0	1	0	0	0	0	2	1	2	6
Others (Ergonomics, Physical)	1	2	0	0	2	2	0	1	2	2	0	0	12
ADMINISTRATIVE REVIEW													
Protocol Screening	3	2	2	0	0	2	0	4	1	3	0	1	18
Protocol Review	3	2	2	0	0	2	0	1	1	2	0	1	14
Project Review	1	2	1	1	2	3	2	3	2	4	3	2	26
TOTAL	5	6	5	1	2	7	2	8	4	9	3	4	56
HAZARD ASSESSMENT													
Safety Clearance for Maintenance/Renovations	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAINING													
Basic Hazard Communication	32	38	22	20	35	34	25	14	35	39	41	36	371
Other Training Provided	84	6	6	2	12	18	7	26	13	3	3	34	214
TOTAL	116	35	28	22	47	52	32	40	48	42	44	70	576
STAFF CONTINUING EDUCATION (HOURS)	28	28	12	12	15	13	12	12	28	12	12	16	200

Biological Safety



Individuals trained

Laboratory inspections

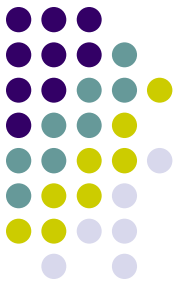
Deficiencies identified and resolved

Incident response to biological agents

Biological Safety Cabinet verifications

Institutional Biosafety Committee protocols

		Monthly Activity Summary FY 06												
		September	October	November	December	January	February	March	April	May	June	July	August	Totals
SURVEILLANCE														
	Laboratory Surveys (BSL-2)	180	19	14	14	16	21	12	119	7	8	16	17	426
	Laboratory Surveys (BSL-3)	4	4	4	4	4	4	4	4	4	4	4	4	44
	Clinic Surveys	0	0	0	0	0	0	42	0	0	20	0	0	62
TOTAL		184	23	18	18	20	25	58	123	11	32	20	21	532
	Total deficiencies noted	15	34	11	18	14	15	11	33	18	7	9	18	203
	Deficiencies corrected On-Site	8	13	2	5	6	2	1	1	4	1	2	4	49
	Deficiencies to be corrected by PI / Researcher	9	16	9	7	7	13	9	15	13	6	6	9	119
	Deficiencies to be corrected by EH&S	0	3	0	4	1	0	1	17	1	0	0	5	32
	Deficiencies to be corrected by Facilities	0	2	0	2	0	0	0	0	0	0	1	0	5
	Deficiency follow-up surveys	9	21	9	13	8	13	10	33	13	7	7	9	152
	Deficiencies found corrected	0	13	0	9	2	3	0	22	3	2	0	3	57
	Deficiencies Outstanding	9	8	9	4	6	10	10	11	10	5	7	6	95
OCCUPATIONAL & ENV. MONITORING														
	Bioaerosol / IAQ monitoring	0	0	0	0	0	0	0	0	0	0	0	4	4
	Biological Safety Cabinet (visual)	11	18	23	10	15	15	7	12	9	5	17	15	157
	Respirator fit-testing (N-95)	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL		11	18	23	10	16	15	7	12	9	5	17	19	162
INCIDENT RESPONSE														
	Biological agent spills	0	0	0	0	0	0	1	2	0	1	0	3	7
	Indoor Mold Assessments	3	1	0	0	2	2	1	0	2	5	5	6	27
	IAQ / Odor complaints	3	2	0	0	2	1	3	1	2	2	1	2	19
	Others (injury, ventilation)	4	0	0	1	3	0	3	2	2	2	0	0	17
TOTAL		10	3	0	1	7	3	8	5	6	10	6	11	70
INVESTIGATION (INJURY / EXPOSURE)														
	Suspected exposure to an infectious agent	1	0	0	0	0	0	1	0	1	1	0	2	6
	Injury due to physical agent (ergo, etc)	2	0	0	0	0	1	1	1	1	2	1	1	10
	Others	0	0	0	0	0	3	0	0	1	0	0	0	4
	Employee Needlesticks Reported	0	2	2	0	0	2	0	0	1	4	2	2	15
	Student Needlesticks Reported	3	2	3	0	5	3	0	2	3	6	1	4	32
	Resident Needlesticks Reported	4	2	4	1	2	6	1	4	1	4	3	1	33
TOTAL		10	6	9	1	7	15	3	7	8	17	7	10	100
ADMINISTRATIVE REVIEW														
	Protocol screening	5	6	6	6	7	6	6	5	6	8	9	13	83
	Protocol review	2	6	4	3	2	2	3	4	2	4	8	10	50
	Project review	2	0	0	4	3	1	2	2	1	1	1	0	17
TOTAL		9	12	10	13	12	9	11	11	9	13	18	23	150
TRAINING														
	Lab & Clinic Safety including BBP	116	38	28	24	49	27	22	6	31	231	41	312	925
	Annual BBP Refresher	87	42	1	5	41	3	14	29	1	23	40	70	356
	Shipping Inf. Substances & Diagnostic Specimens	2	43	3	0	7	3	0	0	12	3	3	3	79
	Other	0	0	2	1	1	29	9	1	1	1	2	1	48
TOTAL		205	123	34	30	98	62	45	36	45	258	86	386	1408
STAFF CONTINUING EDUCATION (hours)		18	52	18	17	70	16	20	52	9	11	10	11	304



Radiation Safety

Individuals trained

Laboratory inspections

Dosimetry

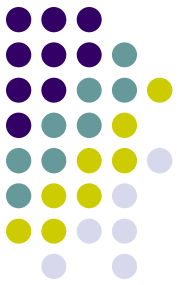
Bioassays

Instrument calibrations

**Radiation Safety Program
Monthly Activity Summaries FY 2006**

	September	October	November	December	January	February	March	April	May	June	July	August	Totals
RADIOACTIVE INVENTORY													
# Vials Inspected	48	52	32	30	47	49	48	40	58	55	34	39	532
# mCi Distributed	260	150	143	123	143	152	146	132	142	154	3255	128	4928
Total Inventory (mCi)	637	670	631	645	604	605	578	610	569	483	402	452	6886
Deliveries	48	52	16	5	4	6	3	3	1	1	2	2	143
AUTHORIZED USERS													
# Authorized Users - current	161	160	159	159	159	160	160	160	159	159	161	159	1916
# Authorized Users - added	0	0	1	0	0	1	0	0	0	0	2	0	4
# Authorized Users - deleted	1	1	1	0	0	0	0	0	1	0	0	2	6
Total # Authorized Labs	363	364	366	366	368	367	368	368	357	360	358	358	4363
# New Protocols with AU's	0	0	1	0	3	2	2	0	1	1	3	0	13
# New Amendments with AU's	0	0	1	0	0	0	0	0	1	1	0	0	3
RAD LABORATORY INSPECTIONS													
# Labs Inspected	41	57	39	41	41	70	43	60	45	44	34	57	572
# Rad Deficiencies Noted	14	26	11	13	17	8	18	16	15	16	3	22	179
# Deficiencies Corrected on Site	2	7	0	0	2	3	3	6	5	7	0	4	39
# Deficiencies To Be Corrected by PI	10	25	11	12	13	5	3	2	11	10	3	22	127
# Deficiencies To Be Corrected by EH&S	4	1	0	1	2	3	15	14	4	6	0	0	50
# Deficiencies To Be Corrected by Facilities	0	0	0	1	0	0	0	0	0	0	0	0	1
# of Deficiency Follow-up Surveys	12	19	11	13	15	5	15	11	10	9			120
# of Deficiency Follow-up Surveys Found Corrected	2	0	2	1	5	2	0	2	1	0			15
# of Deficiencies Outstanding	10	19	9	12	10	3	15	9	9	9			105
PERSONNEL DOSIMETRY													
# Monthly Badges	65	65	64	54	54	51	55	47	53	54	55	57	674
# Quarterly (Administrative) Badges	200	213	182	184	179	175	175	178	170	191	199	188	2234
Total # Participants	265	278	246	238	233	226	230	225	223	245	254	245	2908
# Badges Not Returned in Previous Monitoring Period	14	19	8	12	6	14	7	18	10	5	5	3	121
Dose Assessments of Non-Administrative Badges	0	2	2	0	2	2	4	0	3	0	0	3	18
Dose Exceeding ALARA Limit	0	1	0	0	0	0	0	0	1	0	6	0	8
BIOASSAY													
# Bioassays	0	0	2	0	2	0	1	0	0	4	0	0	9
TRAINING													
Participants Completed Basic Radiation Training	12	0	10	0	11	0	11	0	9	0	23	0	76
Other Education (attendance)	0	48	8	0	10	6	2	129	80	24	25	133	465
DEVICES													
Sealed Source Leak Tests	0	0	72	0	0	0	0	0	72	0	0	0	144
X-Ray Machine Inspections	0	0	0	0	64	0	0	0	0	0	64	0	128
Instrument Calibrations	6	20	6	6	15	11	12	3	35	3	8	10	135
Laser Inspections	0	0	0	19	0	0	0	0	0	17	0	0	36
OTHER SERVICES													
Incident Investigations	0	0	0	1	1	1	4	0	0	1	1	0	9
Off-Site Shipments	1	1	1	1	1	1	1	2	1	1	1	1	13

Environmental Protection



Disposal costs

Waste weights or volumes

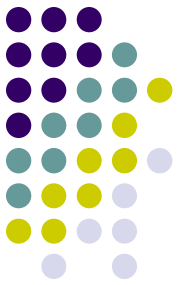
Effluents released

Cost avoidance

Environmental Health & Safety Environmental Protection Program

Environmental Protection Program Summary

		<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>TOTALS</i>
WASTE GENERATED														
	Radioactive Waste (ft ³)	16.71	82.05	68.69	97.56	62.07	77.24	55.19	37.28	41.70	73.50	94.22	50.92	757
	Chemical & HW Waste (lbs)	1,037	1,086	934	1,318	923	792	741	685	2,896	753	913	640	12,718
	Facility / AE Waste (lbs)	1,203	0	120	1,618	905	2,147	91	289	319	1,181	120	405	8,398
	Biological Waste (lbs)	8,894	5,458	5,094	6,559	6,880	6,759	8,685	6,634	6,597	8,788	6,769	8,465	85,582
WASTE DISPOSAL														
	Radioactive Waste (ft ³)	16.71	81.65	68.69	97.56	61.87	77.24	55.19	37.28	41.70	73.50	94.22	50.92	757
	Chemical & HW Waste (lbs)	2,415	0	1,683	750	0	40	4,496	0	4,047	0	0	0	13,431
	Facility / AE Waste (lbs)	1,203	0	120	1,618	905	2,147	91	289	0	4,472	0	0	10,845
	Biological Waste (lbs)	8,894	5,458	5,094	6,559	6,880	6,759	8,685	6,634	6,597	8,788	6,769	8,465	85,582
Activities														
	CAPITAL ASSETS MANAGEMENT													
	CATER Inspections (comprehensive asset tracking and environmental release program)	88	124	77	66	96	84	72	68	102	99	48	38	962
	Waste Pickups	98	132	124	114	118	128	117	104	97	134	166	128	1,460
	Environmental Surveys	0	0	0	34	0	0	0	0	14	0	36	0	84
	Deficiencies Noted	0	0	0	30	0	0	0	0	1	0	16	0	47
	Deficiencies Corrected	0	0	0	0	0	19	0	0	0	0	2	0	21
	Laboratory Relocations	0	0	0	0	0	0	0	0	32	0	0	8	40
	Laboratory Cleanouts	3	2	0	3	3	3	2	1	34	2	4	8	65
Cost Obligations														
	Waste Disposal	\$16,900	\$10,405	\$13,371	\$48,413	\$23,695	\$12,616	\$27,759	\$7,743	\$21,543	\$26,137	\$12,727	\$7,747	\$229,056
	Laboratory Relocation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$27,350	\$0	\$0	\$4,400	\$31,750
	TOTAL (\$)	\$16,900	\$10,405	\$13,371	\$48,413	\$23,695	\$12,616	\$27,759	\$7,743	\$48,893	\$26,137	\$12,727	\$12,147	\$260,806
Expenditures														
	Waste Disposal	\$3,600	\$452	\$1,114	\$1,699	\$888	\$1,318	\$4,603	\$519	\$3,302	\$2,625	\$610	\$718	\$21,448
	Laboratory Relocation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$150	\$0	\$0	\$0	\$150
	TOTAL (\$)	\$3,600	\$452	\$1,114	\$1,699	\$888	\$1,318	\$4,603	\$519	\$3,452	\$2,625	\$610	\$718	\$21,598
Environmental Protection Program Savings														
		\$13,300	\$9,953	\$12,257	\$46,714	\$22,807	\$11,298	\$23,156	\$7,224	\$45,441	\$23,512	\$12,117	\$11,429	\$239,208



How Often?

“Smell the cheese often so you know when it is getting old.”

– Spencer Johnson

Ongoing metrics communicate the effectiveness of processes

“Every time you get the chance” – Emery

Communicating Metrics



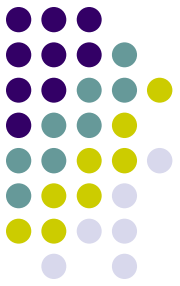
Focus on outcome metrics not output

Select emerging issues and opportunities to communicate

Report on strategic goals

Remember to tie it to the mission of the organization

Caveat



“Not everything that can be counted counts, and not everything that counts can be counted”

- Albert Einstein