Key EH&S Performance Indicators and Metrics for Senior Management in Higher Education

Midwestern Higher Education Compact
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The University of Texas Health Science Center at Houston
Agenda

- Three realities we face in our setting
- An evidence-based approach to EH&S benchmarking
- EH&S Program Key Performance Indicators (KPI’s)
- Safety Culture and desire to graduate students who meet corporate safety expectations
- Questions, discussion
For context, we face three realities....

1st: Universities Compare Many Things

- Revenues
- Tuition and fees
- Size
- Appearance
- Number of students
- Number of faculty
- Research productivity
- School rankings
- Athletics

- Student entry grade point average, SAT scores
- Amount of grant funding and by whom
- Revenues from tech transfer
- Reputation
- ... and yet there are some who think you can’t compare EH&S programs

“While individuals may be insolvable puzzles, in the aggregate they become mathematical certainties”

“Comparison is the mother of insight”
For regulatory purposes we document...

- Pounds of hazardous waste
- If a person was trained
- If a person was hurt

For performance purpose we should document...

- Number of pick ups
- How many people were trained, and did their performance reflect it
- How many people were hurt, what caused the injury, and what are we doing about it
Lagging versus Leading Indicators

• Lagging:
  • OSHA Recordable Injury-Illness Rates
  • Days Away Restricted or Transferred (DART) Rate
  • Workers’ Compensation Loss Costs
  • Fines or penalties
  • Property losses

• Leading:
  • Number of people who correctly identify what to do in an emergency situation
  • # Emergency Drills
  • Anonymous Safety Perception Survey feedback
  • Near miss reports and follow-up
  • Mitigation efforts
3rd: The Constancy of Change

At The University of Texas School of Public Health we have asked many safety professionals: “how long have your personally reported to the person you report to?”

The results have been strikingly consistent:

- About 80% have reported to the person they currently report to for less than 5 years
- And 25% for less than 1 year!

This suggests that most practicing safety professionals can expect to have 6 to 30 different bosses over a 30 year working career!
But While Some Things Change... Others Don’t

- Although the organization you work for or person you report to may change, the key performance indicators (KPI) for the EH&S program remain constant....
  - Frequency and severity of reported illnesses and injuries; property losses
  - Regulatory compliance
  - Finances
  - Client satisfaction

- What does change is the method, framing, and formatting of the delivery of the information

- Acknowledging this fact is crucial for ongoing program support
Staffing Predictors

- The data from 102 colleges and universities 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 (Y/N)
  - Existence of BSL-3 operations (Y/N)

- These predictors important because they are recognized and understood by those outside the EH&S profession
- With the collection of more data, the precision of the model could likely be improved to the benefit of the entire profession

\[
\# \text{ EH&S FTE} = e^{[(0.516 \times \text{School}) + (0.357 \times \ln(\text{Lab NASF})) + (0.398 \times \ln(\text{Nonlab NASF})) + (0.371 \times \text{BSL})] - 8.618}
\]
EH&S Department Annual Cost per Campus Net Assignable Square Footage
(n = 31)

Number reported in each cost category

EH&S annual dollar cost per campus net assignable square foot

0.05 - 0.11
0.12 - 0.17
0.18 - 0.23
0.24 - 0.29
0.30 - 0.35
0.36 - 0.41
0.42 - 0.47
0.48 - 0.53
0.54 - 0.59
0.60 - 0.65
0.66 - 0.71
0.72 - 0.77
0.78 - 0.83
0.84 - 0.89
0.90 - 0.95
0.96 - 1.01

EH&S annual dollar cost per campus net assignable square foot
Practical Example

- Institution with 5 million total institutional NASF and $900 million in total annual institutional expenditures
  - Using $0.30/ft² = $1,500,000
  - Using most recent vital statistics model:
    - EHS expenditures = $1,568,967
    - EHS staffing = 16.7 FTE
  - If that same university was an AAHC institution
    - EHS expenditures = $2,064,581 (31% increase)
    - EHS staffing = 22.9 FTE (37% increase)
## Estimated Annual UTHealth Institutional Services Cost per Square Foot

(FY 10 estimates based on UTHealth square footage of 3,164,000 state \(^{(a)}\) + 1,836,000 auxiliary = 5,000,000 ft\(^2\) \(^{(b)}\) )

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost per Square Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities (electricity, gas, steam)(^{(a)})</td>
<td>$5.38</td>
</tr>
<tr>
<td>Facilities Services (salaries, maintain &amp; ops)(^{(a)})</td>
<td>$2.98</td>
</tr>
<tr>
<td>Police(^{(a)})</td>
<td>$1.00</td>
</tr>
<tr>
<td>Information Technology Support(^{(a)})</td>
<td>$1.00</td>
</tr>
<tr>
<td>Contract Services (housekeeping, trash)(^{(a)})</td>
<td>$0.58</td>
</tr>
<tr>
<td>Insurance Premiums (property, WCI)(^{(b)})</td>
<td>$0.50</td>
</tr>
<tr>
<td>Environmental Health &amp; Safety(^{(b)})</td>
<td>$0.45</td>
</tr>
</tbody>
</table>
Budget Goal Example

WU EH&S Controllable Cost (Budget) / NASF

Goal = $0.45
Tracking Key Metrics

Percent Change of WU Key Indicators Compared to 2005

- Total Net Assignable Square Feet (NASF)
- Lab Net Assignable Square Feet (NASF)
- Clinic Net Assignable Square Feet (NASF)
- WU Revenues ($) Annual Report
- Research Expenditures ($) OVCR
- Research Expenditures ($) OVCR w/o ARRA
- EH&S FTE

Fiscal Year:
- FY05
- FY06
- FY07
- FY08
- FY09
- FY10
- FY11
- FY12
- FY13
- FY14
- FY15
- FY16
- FY17
- FY18
SHERM’s Four Key Performance Indicators (KPI) for Safety Services to the Institution

<table>
<thead>
<tr>
<th>KPI #1: Losses</th>
<th>KPI #2: Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>With external agencies</td>
</tr>
<tr>
<td>Property</td>
<td>With internal assessments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KPI #3 Finances</th>
<th>KPI #4 Client Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditures</td>
<td>External clients served</td>
</tr>
<tr>
<td>Revenues</td>
<td>Internal department staff</td>
</tr>
</tbody>
</table>

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KPI #1: Losses

- **Personnel**
  - Numbers of first reports of injury submitted by employees, residents, students
  - Employee injury and Illness rate
  - Workers’ Compensation Insurance experience modifier

- **Property**
  - Losses incurred and covered by UTS Comprehensive Property Protection Program
  - Losses incurred but covered by outside party
  - Losses retained by UTHealth
FY17 Number of First Reports of Injury, by Population Type

(2016 estimated total population 13,064*; employees: 7,272; students: 4,811; resident/fellows: 981)

Number of First Reports

Oversight by SHERM

FY17 Total n = 410
FY17 Employees n = 28
FY17 Residents n = 102
FY17 Students n = 19
Annual UTHealth Incidence Rate of Reported Employee Injuries and Illnesses Compared to National Hospital and University Rates and Three Major Companies With Acknowledged “Best in Class Safety” Programs (national data source: US Bureau of Labor Statistics)
OSHA Recordable Rate versus DART Rate

OSHA Recordable Injury/Illness Incident Rates for Washington University

DART Rates for Washington University

OSHA Days Away Restricted or Transferred (DART) Rate
Targeting High Risk Areas

WU School of Medicine (WUSM) Needle Stick Incident Rate versus All-Other WUSM Injury-Type Rate

Incident Rates (with Trend) for Washington University - Division of Comparative Medicine

DART Rates for Washington University Medical School and DCM
FY17 Property Losses

Retained Losses (inclusive of insurance deductibles)

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Date</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>CDC</td>
<td>10/29/2016</td>
<td>$5,000</td>
</tr>
<tr>
<td>Water</td>
<td>SPH</td>
<td>12/04/2016</td>
<td>$2,000</td>
</tr>
<tr>
<td>Water</td>
<td>MSB</td>
<td>1/07/2017</td>
<td>$20,000</td>
</tr>
<tr>
<td>Water</td>
<td>MSB</td>
<td>1/17/2017</td>
<td>$89,000</td>
</tr>
<tr>
<td>Mold</td>
<td>SON</td>
<td>3/09/2017</td>
<td>$800</td>
</tr>
<tr>
<td>Water</td>
<td>Housing</td>
<td>5/19/2017</td>
<td>$700</td>
</tr>
<tr>
<td>Vandalism</td>
<td>UCT</td>
<td>5/29/2017</td>
<td>$2,000</td>
</tr>
<tr>
<td>Auto</td>
<td>Field</td>
<td>8/14/2017</td>
<td>$6,000</td>
</tr>
<tr>
<td>Water</td>
<td>Various</td>
<td>Various</td>
<td>$3,700</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>$129,200</td>
</tr>
</tbody>
</table>

NOTE: Above table does not include losses associated with Hurricane Harvey. Total losses expected to be approximately $10M with retained losses to UTHealth TBD.

Losses incurred and covered by third party
- Auto ------------ 10/2016 $5,000
- Water------------12/2016 $2,000
- Hurricane--8/2017 approx. 10M

Losses incurred and covered by UTS insurance
- Auto-------------8/2017 $5,000

*Hurricane loss not shown in graph
KPI #2: Compliance

- **With external agencies**
  - Regulatory inspections; other compliance related inspections by outside entities

- **With internal assessments**
  - Results of EH&S routine safety surveillance activities
<table>
<thead>
<tr>
<th>Date</th>
<th>Agency</th>
<th>Findings</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>July 18, 2017</td>
<td>Training records and dosimetry unavailable for unannounced inspection (UTHealth – Brownsville CRU, X-ray R10908, site 024)</td>
<td>Inspection file closed; training provided to bone densitometry operators and dosimetry reports provided.</td>
</tr>
<tr>
<td>19</td>
<td>July 18-19, 2017</td>
<td>Several minor observations and recommendations for improvement</td>
<td>All observations addressed; inspection file closed</td>
</tr>
<tr>
<td>20</td>
<td>August 7, 2017</td>
<td>No items of non-compliance (UT Physicians 3 clinics: Urology, General Medicine, TMC Sports Medicine, X-ray R26367, sites 033, 034 and 032)</td>
<td>Inspection file closed</td>
</tr>
<tr>
<td>21</td>
<td>August 15, 2017</td>
<td>No items of non-compliance (UTHealth – Broad license L02774, South Campus (BBSB, SCRB3 and SOD), site 007)</td>
<td>Inspection file closed</td>
</tr>
<tr>
<td>22</td>
<td>August 23, 2017</td>
<td>No items of non-compliance (UTHealth – School of Dentistry Building, X-ray R10908, site 009)</td>
<td>Awaiting inspection report</td>
</tr>
</tbody>
</table>
External Agency Inspections

Number of EH&S Regulatory or Accreditation Inspections at WU by Outside Agencies

Fiscal Year

Number of Regulatory/Accreditation Inspections

FY08, FY09, FY10, FY11, FY12, FY13, FY14, FY15, FY16, FY17
Internal Compliance Assessments

- 6,041 workplace inspections documented
  - Progression of routine surveillance program emphasis: labs, building fire systems, now mechanical and non-lab spaces
  
  - 2,158 deficiencies identified (70% in non-lab spaces)
    
    - 789 of these deficiencies now corrected to date through improved communications with FPE
    
    - Remaining 1,369 deficiencies (predominantly minor issues) subject to follow up correction:
      » Example: mechanical room deficiencies - unlabeled circuit breakers, missing outlet covers, etc.
    
    - Working with FPE to track and report progress and reporting progress to appropriate safety committees

- 4,739 individuals provided with required safety training

- 70% of PIs have submitted chemical inventories for filing in database
KPI #3: Finances

- **Expenditures**
  - Program cost, cost drivers

- **Revenues**
  - Sources of revenue, amounts
Campus Square Footage, SHERM Resource Needs and Funding

(modeling not inclusive of resources provided for, or necessary for Employee Health Clinical Services Agreement)

Total Assignable Square Footage and Research Subset

<table>
<thead>
<tr>
<th>Year</th>
<th>Research area (sf)</th>
<th>Non-research area (sf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY11</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>FY12</td>
<td>350,000</td>
<td>350,000</td>
</tr>
<tr>
<td>FY13</td>
<td>400,000</td>
<td>400,000</td>
</tr>
<tr>
<td>FY14</td>
<td>450,000</td>
<td>450,000</td>
</tr>
<tr>
<td>FY15</td>
<td>500,000</td>
<td>500,000</td>
</tr>
<tr>
<td>FY16</td>
<td>550,000</td>
<td>550,000</td>
</tr>
<tr>
<td>FY17</td>
<td>600,000</td>
<td>600,000</td>
</tr>
</tbody>
</table>

Source: FPE, Space Management
Total Hazardous Waste Cost Obligation and Actual Disposal Expenditures
(Inclusive of Biological, Chemical, and Radioactive Wastes)

FY17 savings: $122,476
FY17 Revenues

- **Service contracts**
  - UT Physicians $396,293
  - UT Med Foundation WCI Administration $31,993

- **Continuing education courses/outreach**
  - Training, honoraria, peer reviews, and fit testing for non-UTHealth personnel $18,126

- **Total** $446,412

**NOTE:** Equates to 17% of total SHERM budget for FY17
KPI #4: Client Satisfaction

- External clients served
  - Results of Client Satisfaction Survey for annual Area Safety Liaison training program
- Internal department staff
  - Summary of ongoing staff professional development activities
### Survey of Area Safety Liaisons Regarding Annual ASL Training Provided by EHS

Web based survey distributed from 8/3/2017 to 8/24/2017 to 155 Area Safety Liaisons who participated in the 2017 ASL Training by Environmental Health and Safety

Survey response rate: 80 out of 155 (52%)

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Responses</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did the ASL 2017 training session provide information that is useful to you as an ASL?</td>
<td>Yes</td>
<td>78</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2. Do you feel that the topics covered in this year’s training session were appropriate for your needs?</td>
<td>Yes</td>
<td>80</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3. Do you believe that the videos created by OSFP were beneficial to you as an ASL?</td>
<td>Yes</td>
<td>77</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>4. Do you feel the length of the training session was appropriate?</td>
<td>Yes</td>
<td>72</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>5. Do you feel that one training session per year is adequate for you to fulfill your duties as an ASL volunteer?</td>
<td>Yes</td>
<td>65</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>6. Do you feel you have adequate access to the ASL program information and assistance via either phone, email and/or in person?</td>
<td>Yes</td>
<td>76</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>7. Do you feel the OSFP staff process the knowledge to address your needs related to occupational safety and fire prevention at UTHealth?</td>
<td>Yes</td>
<td>79</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>8. Do you feel the OSFP personnel provide helpful and courteous service?</td>
<td>Yes</td>
<td>79</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>9. If you have been involved with the fire warden, fire prevention or area safety liaison program at other institutions, please rate how the service at UTHealth compares:</td>
<td>Yes</td>
<td>67</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No Opinion</td>
<td>0</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
Safety Perception Survey

Anonymous feedback from faculty, staff and students on their Top 3 Safety Concerns:

<table>
<thead>
<tr>
<th>Safety Concern</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Security</td>
<td>27%</td>
<td>36%</td>
<td>25%</td>
</tr>
<tr>
<td>Chemical Hazards</td>
<td>24%</td>
<td>23%</td>
<td>14%</td>
</tr>
<tr>
<td>Indoor Air Quality</td>
<td>23%</td>
<td>21%</td>
<td>24%</td>
</tr>
<tr>
<td>Vehicle-Pedestrian-Bike Safety</td>
<td>19%</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>Ergonomics</td>
<td>18%</td>
<td>18%</td>
<td>21%</td>
</tr>
<tr>
<td>Total Worker Health</td>
<td>18%</td>
<td>17%</td>
<td>13%</td>
</tr>
<tr>
<td>No Safety Concerns</td>
<td>14%</td>
<td>12%</td>
<td>17%</td>
</tr>
</tbody>
</table>
Washington University in St. Louis Example: Anonymous Customer Service Feedback Survey Results from Faculty, Staff and Students

- To what extent do you think EH&S properly balances its oversight mission with providing you with the information you need to understand and meet your EH&S safety and compliance roles and responsibilities?

- How well does EH&S help you meet your safety and compliance training needs?

<table>
<thead>
<tr>
<th>Year</th>
<th>Positive</th>
<th>Goal</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>94%</td>
<td>85%</td>
<td>0%</td>
</tr>
<tr>
<td>2016</td>
<td>95%</td>
<td>85%</td>
<td>0%</td>
</tr>
<tr>
<td>2017</td>
<td>98%</td>
<td>85%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Positive</th>
<th>Goal</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>93%</td>
<td>85%</td>
<td>7%</td>
</tr>
<tr>
<td>2016</td>
<td>98%</td>
<td>85%</td>
<td>2%</td>
</tr>
<tr>
<td>2017</td>
<td>97%</td>
<td>85%</td>
<td>3%</td>
</tr>
</tbody>
</table>
Do you feel comfortable reporting your safety concerns to your department or EH&S?

- 2015: 93%
- 2016: 91%
- 2017: 98%

Do you feel your department or the University follows up on your safety concerns, once reported?

- 2015: 87%
- 2016: 89%
- 2017: 91%
Do not forget your own staff – anonymous staff satisfaction surveys
New Indicators Colleges & Universities are starting to Assess and Track

- **Culture of Safety**
  - External Team of Experts review attitudes towards safety culture
    - On-campus(es) for multiple days
    - Meet with Provost, VP for Research, Dean, Department Chairs, Committee Chairs, Faculty, Lab Manager, Staff, Students, EH&S, Compliance, Risk Management
  - Tour facilities; review policies, procedures and practices

- **Basis for reviews:**
  - [National Research Council](http://www.norc.org)
  - [Association of Public & Land-Grant Universities](http://www.aplu.org)
  - Expectations from Industry (Dow, DuPont, ExxonMobil, etc.)
Example of National Research Council Recommendations Comparison – presented to the Washington University Board of Trustees Audit Committee

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>In-Place</th>
<th>Challenges</th>
<th>Grade Versus Peers</th>
<th>Grade Versus NRC Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommendation 1: Leaders Actively Demonstrate Safety is a Core Value</td>
<td><img src="https://example.com" alt="Image" /></td>
<td><img src="https://example.com" alt="Image" /></td>
<td><img src="https://example.com" alt="Image" /></td>
<td><img src="https://example.com" alt="Image" /></td>
</tr>
<tr>
<td>Recommendation 2: Incorporate Positive Safety Culture into Promotion, Tenure &amp; Salary Decisions</td>
<td><img src="https://example.com" alt="Image" /></td>
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Nearly 30% of researchers said that safety is not the highest priority

Analysis: The question was phrased exactly the same for both groups, and there is statistically significant difference between the two groups. While mostly positive, it should give us pause that 28% of the researchers do not “agree” with this statement, but answer neutral or disagree.

Q: In our lab, safety is the highest priority
Examples of industry driven initiatives

Dow + U = lab safety

A new safety campaign for laboratories takes hold

They say you can never be too careful. At the University of Minnesota, that goes double.
Summary

- The key denominator for college and university EH&S is total net assignable square footage – so use this metric to your advantage!

- Key EH&S performance indicators include:
  1. Losses,
  2. compliance,
  3. financial,
  4. client satisfaction,
  5. safety culture

- Collect data and readily display it at every opportunity!

- In our setting change and comparisons are inevitable…. we should take the lead so that evidenced-based, rational comparisons are made on a consistent basis
Your Questions and Comments are Welcomed

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