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1	Q&A Report:	Smart Labs - Roadmap to High Performance Laboratories
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3	Q&A	
4	Question Asked	Answer Given
5	If a university is not staffed such that it can exercise a high level of control of changes in research, or even to perform an on-going review of risk levels, what recommendations would you have beyond assuring systems maintenance?	Labs are big energy users. Utilizing a Lab Ventilation Risk Assessment (LVRA) will allow for managing ACR's more closely aligned with current operation. The amount of energy savings will usually justify having a LVRA done periodically to help manage change. It can be a simple outsourced contract.
6	This has been fantastic. Will there be a link emailed out for the download of the recording?	It will be on the APPA web site, or you can contact us at tchecksfield@labhoodpro.com
7	To provide DCV on laboratories, how do you determine which contaminant to sense?	DCV systems will list the contaminants they will sense. Also, depending on what contaminants are being used in a particular lab, you may want to find the DCV sensing that best matches that application. DCV controllers on the market today do not sense all contaminants.
8	How about using Systems Manuals that can be part of the LEED certification for a building. Well defined by ASHRAE.	This can be helpful, and used as a guide, but lab ventilation risk assessment should be done to associate risk level with ACH control band
9	Can you discuss technologies and strategies to safely modulate the exhaust fan exit velocity and how this effects ANSI Z9.5 recommended exit velocity of 3000 ft/min	Using a LVRA - Lab Ventilation Risk Assessment to assign different ACR's (control bands) to associated control valves allows you to sum them all up to give you an overall aggregate exhaust control band. Updating this risk assessment allows for managing the change in exhaust flow requirement for the entire building.

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10	Michael Hoffman (Univ. of Arizona): How does your approach change when dealing with pneumatic controls as opposed to DDC?	The approach itself does not change. The lab ventilation risk assessment (LVRA) is what it is. The evaluation of the HVAC system is what it is, The Pneumatic controls are a part of that system. After the assessments are in, current state of the pneumatic controls will be evaluated. If they are performing well then they will do what they can do. Some things to look at are how they are connected to the BMS? Perhaps they aren't. The other is speed of response. Getting data or analytics from pneumatic controls can be difficult to non existent. Lab buildings can certainly be optimized with current pneumatic controls but only when it is clear what the pneumatic controls can and can't do.
11	Where are you getting the data to support labs being unoccupied or not in use 75% of the time?	There are several sources for this info including I2SL and ASHRAE. Most of this comes from our own experience testing over 40,000 fume hoods over the last 25 years. Lab usage varies from application and customer. Many labs are utilized at high percentage rates. All lab buildings regardless of occupancy percentage are good candidates for developing a LVMP - Lab Ventilation Management Plan which includes a LVRA - Lab Ventilation Risk Assesment. Labs with low occupancy rates will potentially allow for greater energy savings while establishing safe operations.
12	How many people, and what positions were they in, were the key decision makers that determined the risk factors to place a building in a particular control band (LVRA) for the university?	The major stakeholders need to be involved. EH&S, facilities, engineering, maintenance, etc., for agreement on a control band. Generally dept heads or managers that make up the stakeholder team for building then Smart Lab program.
13	How do we get a copy of the guide?	It will be on the web site or you can contact tchecksfield@labhoodpro.com

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14	How do you suggest we deal with changing uses in labs? Who is responsible for covering the costs of changing the lab ventilation when people move? Do you assign risk levels to labs and post this publicly, so that people inside know what they can and cannot do?	Managing change in labs is essential as they are always changing. If existing lab, then knowing what your lab HVAC system is capable of is critical. What are its current operational boundary conditions? Knowing these conditions will tell you how much change the system will handle. It may not be able to go to the highest ACR required. Doing the lab ventilation risk assessment (LVRA) will tell you what control bands and associated ACR's are required in different areas. If new design, then you can design HVAC system to be modular or flexible. This allows for using just the amount of energy that is required in the lab space at that time. As things change, control bands will change and the HVAC system can be built up to accommodate. Some labs are using signage, color coded to show risk level of the lab. Costs for changing out the lab can vary based on agreements. Sometimes the cost is picked up by the research team and other times by the owner.
15	Thank you again.	You are welcome!
16	An early slide indicated that a 3000 fpm exhaust discharge might be an older standard. Is this no longer a requirement?	This is a recommended practice.
17	Can you send us the Slide deck??!! I was late in arriving.. Thanks!	It will be available on the web or you can contact tchecksfield@labhoodpro.com
18	Are you able to recommend the measurement equipment that we can use to determine loads??!! I am thinking of RGA in duct? What do you think?	There are several ways to accommodate this. One way is to measure actual flow of all supply and exhaust dynamically.
19	Excellent works and presentation.	Thank you!
20	Laboratory ventilation not only depends on the hazards nature of lab operation but also heat load in laboratory. How this programmed covers the laboratory heat load, heat released from lab equipment?	This LVRA - Lab Ventilation Risk Assessment only develops ACR's based on ventilation risk factors. It does not take into account heat loads and required cooling. Many times the heating and cooling requirements are accomplished using a dedicated AHU.
21		
22	Thank you very much, shall wait for the email for further details.	Will be posted on web
23	can i get a copy of the power point presentation?	It will be on the APPA web site, or you can contact us at tchecksfield@labhoodpro.com

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24	Apologies if you've already been asked. Will you be providing the presentation electronically?	It will be on the web
25	Is there a call in number	Did you get on to the webinar?
26	I am currently scoping the renovations of two major lab facilities for our University. How do you suggest the interface between design, operations, lab optimization and Risk Management can take place in the most efficient way?	First, as the Roadmap suggests all stakeholders need to get together and start the plan. Then, a scoping study to determine what lab buildings are going be done. It looks like you have done this. Then, a deeper dive into the building that consists of analyzing the HVAC system. You want to determine its operational boundary conditions, Or, its current range of operation. Then, a lab ventilation risk assessment (LVRA) to establish ACR requirements for both spaces and fume hoods. Merge the two reports, establish baselines for safety and from there select appropriate energy conservation measures (ECM's). Then, develop the lab airflow management plan (LAMP). This will give stakeholders a way to manage change, maintain optimization, and protect building ROI. Most of this is laid out in the "Smart Lab Roadmap"
27	IF 12 ACH is not needed, how do we determine that? Also, if you have a lab that the occupant may change over time, how do you suggest designing a lab so that it is flexible enough to change multiple times over the years in use?	The lab ventilation risk assessment assigns control bands to both fume hoods and lab spaces based on many factors using a score carding approach. Each control band is associated with an ACR. As labs will change risk assessment will need to be updated. There are several ways to do this. We call them "trigger points" which can be automated or manual. Whether the control band needs to go up or down, the HVAC system must be able to accommodate this adjustment. If new design, flexible or modular system design may be appropriate for adding greater capacity.

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28	Can the roadmap also be applied to new construction? What are some of the key items that need to be in place to manage labs over the long term?	Yes, the roadmap applies. Usually the owner will know who and what is going into the lab. A lab ventilation risk assessment can be done early on in the design process. Many times lab usage is moved from one building to the other so there is a history to draw from. Now the lab can be more closely designed to what its actual ACR requirements will be. A lab ventilation management plan (LVMP) can be a part of the specification so when the building is turned over to the owner, there is a plan for stakeholders to communicate and manage change. Strategies are now in place to keep the building optimized and deliver continuous sustainability.
29	How do you determine if a high performance fume hood meets the SEFA requirements.	Per SEFA, the definition of an Energy Efficient fume hood is as follows: "Low Velocity Laboratory Fume Hoods are hood designs that provide a reduction in the required exhaust air volume, when compared to the volume required for the same size fume hood to operate with a face velocity of 100 FPM through a fully opened vertical sash and provides containment levels equivalent or superior to ASHRAE 110 tracer gas test ratings of 4.0 AM 0.05, and 4.0 AI/AU 0.10, with a face velocity of 60 FPM or less through the fully opened vertical sash. Low Velocity Fume Hoods are also referred to as High Performance Fume Hoods and High Efficiency Fume Hoods"
30	What is the recommended face velocity for snorkels, canopy hoods in laboratories	See the link below on NIH Lab exhaust Testing Propocols https://www.ors.od.nih.gov/sr/dohs/Documents/NIH%20Local%20Exhaust%20Ventilation%20Testing%20Protocols.pdf
31	What is the recommended frequency for maintaining chemical fume hood exhaust fans.	There is no standard. You can use fan manufacturer recommended maintenance frequency. That said, fume hoods should be tested annually for safety and tested as a complete exhaust system that includes the exhaust fan
32	Do you offer a free assessment in the initial planning to determine optimization options	No it is not free. The initial scoping study to profile and determine what lab to do looks at both the HVAC and EH&S. Quick walk through. Pricing depends on building size.

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33	In an educational institution where research space change as researcher leave and come in, how do you optimize the space to meet the changing needs	Managing change in labs is essential as they are always changing. If existing lab, then knowing what your lab HVAC system is capable of is critical. What are its current operational boundary conditions? Knowing these conditions will tell you how much change the system will handle. It may not be able to go to the highest ACR required. Doing the lab ventilation risk assessment (LVRA) will tell you what control bands and associated ACR's are required in different areas. If new design, then you can design HVAC system to be modular or flexible. This allows for using just the amount of energy that is required in the lab space at that time. As things change, control bands will change and the HVAC system can be built up to accommodate.
34	Which software and hardware technologies are smart labs using to monitor and manage buildings with lab space?	Multiple technologies are being used. It starts with the existing, or designed BAS. Control companies use different software/hardware. The key is to get what you are using operating with the various equipment in a way that best fits the lab's required usage. There should be a way to keep the system optimized.
35	are slides available for download now?	Hello Barry. The slides and recording will be available on the APPA website within the next week.
36	"HOW DID THIS HAPPEN?" SLIDE - a key factor not mentioned - big reason is owner not talking to users and communicating it to design team - "that's the way the Engineer designed it" should be based on what owners tell them not what they decided - owners are often unwilling to be as involved as they should be in telling design team how they're going to use the labs - etc..	Very true. Getting the owner to use a lab ventilation risk assessment (LVRA) puts the onus on them. They can now more clearly tell the design team what ACR to design to. This can also result in developing a lab ventilation management plan (LVMP) throughout the design process that can be implemented when the owner takes occupancy. This will allow for better stakeholder communication utilizing a vehicle to manage change.
37	discuss use of horizontal sliding sashes for fume hoods to improve safety - it looked as if one of the slides showed this type of sash (was tis intentional?)	There were some pics of traditional fume hoods with horizontal slides. They are there for the researchers protection. There were also pics from the fume hood retrofit kit that showed sliding shields. These shields are for splash and explosion protection. They are ergonomically designed and allow for a greater vertical opening.

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38	discuss BAS graphics and what the presenting team finds are the most useful/essential for effective monitoring & operation of a lab HVAC system	It really depends on what you are looking to do. Is the system data logging? Is alarming most important? Graphical representation is nice, but you have to know that your devices graphically presented are giving you the correct info. Also, who is looking at and managing from the graphics? Different stakeholders are looking at different analytics. These stakeholders need to get together and work out what graphics they want to see and manage from.
39	how do i get ceu?	Contact Billie Zidek at APPA
40	hi, can we get the slide to the 2nd part of this webinar?	Will be posted on the web site.