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**HOSPITAL BUILDING SAFETY BOARD
Technology and Research Committee**

**Wednesday, July 27, 2022
10:00 a.m. – 4:00 p.m.**

Locations:

Department of Healthcare Care Access and Information
[2020 West El Camino Avenue Suite 930](#)
[Sacramento, CA 95833](#)

Department of Healthcare Access and Information
[355 South Grand Avenue Suite 2000](#)
[Los Angeles CA 90071](#)

Teleconference Meeting Access:
[HBSB Teams TAR Committee](#)
Access Code: 677-110-790

Committee Members Present

Bruce Rainey, Chair
Michael Foulkes, Vice Chair
David Bliss
Deepak Danderkar
Bert Hurlbut
Scott Mackey
Michael O'Connor

HCAI Staff Present

Chris Tokas, FDD Deputy Director
Arash Altoontash
Richard Tannahill
Hussain Bhatia
Carl Scheuerman
Nanci Timmins
James Yi

Consulting Members Present

Gary Dunger
Eric Johnson

HBSB Staff Present

Ken Yu, Executive Director
Evet Torres
Veronica Yuke

1 **1. Call to order and Welcome**

2 Bruce Rainey, Committee Chair, called the meeting to order on July 27, 2022, at 10:00
3 a.m., and HBSB Executive Director Ken Yu, called roll.

4
5 **2. Roll Call and Meeting Advisories/Expectations**

6 Six members of the Committee present constitute a quorum. There being seven present
7 at the time of roll, a quorum was established.

8
9 Mr. Yu read the public announcement regarding COVID-19, meeting rules and
10 procedures.

11
12 **3. Cyber Security Protection**

13 **Presenters:** Gordon Lawson, CEO, and Brian Stone, Chief Revenue Officer,
14 CONCEAL

15
16 Mr. Stone said CONCEAL provides security through obscurity. CONCEAL browser
17 scans links then isolates the link which containerizes the browsing section hence the
18 link can not do harm to the network.

19
20
21 **Discussion and Input**

22 Mr. Rainey asked Mr. Stone to talk about using CONCEAL browser from a building
23 operation stand point. Mr. Stone said that there are two types of the CONCEAL browser
24 and in both, in case of an attack, the containment process helps to isolate malware from
25 the network.

26
27 Mr. O'Connor asked what the restrictive level of links is and if the links must be
28 preapproved. Mr. Stone stated that the links are denied by default unless it is a sure
29 safe link.

30
31 Mr. Hurlbut asked who determines if a site is good, bad or risky. Mr. Stone answered
32 CONCEAL has subscribed to threat intelligence feeds such as Metadefender,
33 VIRUSTOTAL and Google safe browsing. The threat intelligence feeds are different
34 depending on specific industries, like healthcare, and have their own threat feeds. Mr.
35 Stone added that in case of an attack on a safe site through ads, CONCEAL is able to
36 capture that and prevent attack.

37

1 Mr. Bliss asked what gives CONCEAL the current advantage compared to other
2 programs. Mr. Stone answered that CONCEAL works on a deny-by-default concept. If
3 the program is unsure of a site, it sends it to an isolated browser, after verification it then
4 passes to the next stage. By that, CONCEAL is able to learn that similar programs are
5 safe.

6
7 Mr. Bliss asked how the structure of the firewall works. Mr. Chad stated that CONCEAL
8 provides a picture of the actual website. In cases where the remote site is hacked, there
9 would be a picture of the site, but the firewall will prevent codes back to the system.

10
11 Mr. Chad explained that CONCEAL is built with a policy setting that can integrate with
12 existing threat feeds or policies. Mr. Stone added that the three feeds are used to make
13 technical decisions, but for additional websites to be blocked, the policy settings are
14 enforced.

15
16 Mr. Rainey asked what levels are used for whitelisting. Mr. Stone said that the cyber
17 security team vets anything that can be added to the whitelist. Mr. Chad added that the
18 settings and policies can only be accessed by administrators on the security teams so
19 an end user cannot whitelist a site.

20
21 Mr. Bliss asked, in case of a log threat, if there is reporting provided to the contracted
22 institution. Mr. Chad stated that there are reports that shows sites that have been
23 triggered as risky and why the sites have been blocked. Also, there are plugins that feed
24 this kind of information to current login reporting tools so that the IT security teams can
25 find them in a centralized area.

26
27 Mr. Bliss asked how malware is reported to security/law enforcement. Mr. Chad
28 answered that the law enforcers rely on intelligence feeds like other cooperations do.

29
30 For pricing, Mr. Stone stated that the higher the number of browsers that need to be
31 protected, the lower the unit cost.

32
33 Mr. Bliss asked if in institutions like financial services that need to execute high speed
34 internet connections, are the whitelisted sites such that the traffic speed of data is large
35 or does CONCEAL slow enough to affect the speed of data. Mr. Stone stated that there
36 are 11 patterns around the network that allow whitelisting without delaying the speed of
37 data.

38
39

40 **Informational and Action item**

- 41
 - None

1 **4. RIB iTwo 4.0 Software**

2 **Presenters:** Brian Hewgley, Strategic Accounting Executive, and Bassem Ammouri,
3 National Association of Manufacturers Director, Schneider Electric

4
5 Mr. Ammouri stated that the goal of Schneider Electric is to empower the world to make
6 most of energy and resources, bridging progress and sustainability. Schneider tries to
7 prevent miscommunications among members of the value chain especially in
8 construction through adoption of digital technology.

9
10 Mr. Ammouri talked about the Building Information Modeling (BIM). This is a visual data
11 base process which is used to visualize and store data that will define the project itself.
12 He added that BIM models can be used during the construction phase to layer in time
13 and schedules of the different component of the building. Commercial information like
14 price of switch gear and how it can be delivered can be added in the BIM and then a
15 schedule can be extracted from that information. Mr. Ammouri said that BIM has a 6D
16 component in which carbon footprint is attached to each component of the construction
17 asset. The BIM model can be used as a database to store information during the
18 operation and maintenance phase.

19
20 Mr. Ammouri stated three pillars to the RIB company:

- 21 • Cloud First – information that drives the collaboration lives in the Clouds.
- 22 • AI First – ability to use historical data from previous projects that were
23 managed using the software to help with prediction on future projects
- 24 • Mobility First – construction projects are mobile so there is need to be a
25 mobile access point to the BIM model.

26 BIM model technology captures and uses construction data.

27
28 Mr. Ammouri highlighted the different phases of complete construction cloud software

- 29 • Investment planning
- 30 • Design management
- 31 • Virtual construction
- 32 • Bidding
- 33 • Onsite construction
- 34 • Operation and maintenance

35

1 Mr. Ammouri stated that using BIM model-based quality takeoff minimizes the
2 opportunity for human error. BIM models assist in providing accurate multiple versions
3 of estimating management.

4

5 **Discussion and Input**

6 Mr. Bliss asked how to make an operational building carbon neutral. He also asked if
7 building sustainably can be made more economically attractive. Mr. Tokas answered
8 that HCAI is working with the Energy Commission and industries in order to bring code
9 changes that can promote sustainability and also educating the building owner on
10 different designs.

11

12 Mr. Tokas said that buildings going beyond 3D is up to the owner but once industries
13 understand the benefits of 3D, the concept will be adopted.

14

15 Mr. Griffiths asked why would a contractor or an owner move the transition from
16 Autodesk. Mr. Ammouri answered that there is a partnership between Schneider and
17 Autodesk to create an advance electrical design workflow.

18

19 Mr. Griffiths asked if an owner or a client makes a transition to Autodesk, is there an
20 additional cost to the software. Mr. Ammouri answered that since it is a separate
21 software product, it will be an additional subscription.

22

23 **Information and Action item**

- 24 • None.

25

26 **5. NPC-5 Water and Sewage Holding Tanks**

27 **Presenter:** Bruce Rainey, Committee Chair

28

29 Mr. Hageman discussed the California Plumbing Code (CPC) 2019, NPC- 5
30 requirements.

- 31 • Amount of water storage should be computed based on an approved water
32 conservation rationing plan.
- 33 • Not less than 150 gallons per licensed bed.
- 34 • Hookups that allow for the use of transportable sources to augment minimum
35 24 hours storage of potable and process water based on approved Water
36 Conservation/ Water Rationing Plan (WCWRP)

1 Mr. Hageman talked about alternative sizing for NPC-5:

- 2 • Sizing based on meter data for existing loads:
 - 3 ○ Varying Flow rates on older fixtures
 - 4 ○ Irrigation loads may not be clear
- 5 • Not less than 150 gallons per licensed bed:
 - 6 ○ May not be enough for 72 hours
 - 7 ○ May not be enough for 24 hours with delivery option
- 8 • Hook-ups that allow for the use of transportable sources to augment minimum
9 24 hours storage of potable and process water based on approved (WCWRP)
 - 10 ○ Concerns about availability of deliveries?
 - 11 ○ Trucks are typically 3,400-gallon capacity

12
13 Mr. Hageman said that since water is used for waste conveyance, it is unlikely to be
14 reduced through implementation of vacuum waste systems used for water saving. He
15 added that most facilities, during an emergency, do not want to operate without cooling
16 towers, which are not a code requirement, hence there will be no reduction in water
17 usage. In Sterile Processing Department (SPD), manufacturers are using technologies
18 that are saving water. Mr. Hageman pointed out that wastewater/ stormwater treatment
19 for potable use can reduce water usage. Challenges are that most facilities do not want
20 to incur additional cost in the operation and the Water Resource Board will not allow
21 another drinking water provider.

22
23 Mr. Hageman gave the difference between single versus multiple water tanks. In single
24 water tanks:

- 25 • Downtime for cleaning- meaning no emergency water storage
- 26 • Large capacity requires stratification prevention measures.
- 27 • Single point of failure.

28
29 Whereas in multiple water tanks:

- 30 • Tanks can be sized to allow one tank to be offline and still have minimum
31 storage
- 32 • If all tanks are online, there is increased storage
- 33 • Expensive to build and operate

1 Mr. Otis explained that chlorination is a chemical disinfection method that uses various
2 types of chlorine or chlorine containing chemicals for the oxidation and disinfection of
3 what will be the potable water source. He stated that water chlorination is the core for
4 municipal water purification and that chlorination treats cholera, dysentery and typhoid
5 in water.

6
7 Mr. Otis said that chlorine is a much cheaper way of water treatment, prevents
8 reinfection in water, and removes by-products such as heavy ions and ammonia in
9 water. The disadvantages are that chlorine is pH dependent and changes the taste and
10 odor of water.

11
12 Mr. Otis discussed chloramine as a less volatile chemical that stays longer in water and
13 has less disinfection by-products compared to chlorine. Chloramine can penetrate
14 biofilm hence getting rid of harmful bacteria in water. Chloramine work better in hot
15 water systems.

16
17 Mr. Otis talked about chlorine dioxide chemical which is highly effective at penetrating
18 biofilm. He added that the chemical has very few disinfectant by-products and does not
19 alter the taste and odor of water. The chemical works better in hot water system as
20 compared to chloramine.

21
22 Mr. Otis explained that oxygenation is the chemical method of changing the oxygen
23 atom from O₂ to O₃ which is the most powerful oxidizing agent. This process is done by
24 using water, electricity, and the O₃ compound. The process consumes a lot of energy
25 and does not produce any by-products. He revealed that oxygenation destroys bio-
26 organs and removes IONS in water.

27
28 Mr. Otis highlighted that tank mixing prevents stratification during warmer months where
29 hot water tends to stay on top of the tank of cold water on the bottom of the tank. This
30 promotes reinfection of bacteria in water.

31 32 **Discussion and Input**

33 Mr. Danker asked if there was a future possibility of using recycled water for non-
34 potable use. Mr. Hageman indicated that there is a possibility for future proofing to allow
35 a separate piping water for toilet flushing connected to potable water system to
36 reconnect to recycled water. Mr. Tokas added that this is not doable because it is a
37 hospital environment so it requires a closed system which requires different plumbing
38 and different precautions.

39
40 Mr. Mackey asked if the health department recognizes chloramine or chlorine dioxide as
41 effective treatments. Mr. Otis responded that the health department does recognize the
42 two as effective water treatment methods, but it should be confirmed.

1 Mr. Rainey suggested if the board could develop this topic into a White Paper to
2 improve expertise of water maintenance and conservation. Mr. Mackey agreed and
3 added that water conservation is a critical issue and typical for facilities across the State
4 of California.

5
6 Mr. Hurlbut asked if there was a need to have sewage storage tanks as well as water
7 storage tanks to maintain NPC-5. Mr. Hageman replied that waste storage holding is
8 required for 72 hours.

9
10 Mr. Hageman asked if the waste storage required by the code to match water storage.
11 Mr. Bhatia disclosed that there are no minimum requirements for waste storage in the
12 code.

13
14 Mr. Rainey asked if the committee should look at establishing a subgroup or meeting
15 offline with experts and come up with a strategy. Mr. Mackey moved that the committee
16 accept meeting offline with engineering firm experts, and then present back to the group
17 at a later date.

18
19 Mr. Bliss suggested that it might be worth having committee members submit topics
20 around water conversation, then the Chair can winnow down to something manageable,
21 and consult engineering firm experts. Mr. Rainey agreed and asked members to forward
22 their points. Mr. Yu urged the committee members to send their points to either him or
23 Ms. Torres.

24
25 Mr. Hurlburt asked if fire water storage was part of NPC-5 or the Plumbing Code. Mr.
26 Hageman answered that it is not part of NPC-5 Code.

27

28 **Information and Action item**

- 29
- None.

30

31 **6. All-Electric Campus – A Use Case**

32 **Presenter:** Becky Clift, WSP and Roger Carter, tk1sc

33

34 Mr. Carter stated that the presentation was about how the healthcare build environment
35 fits into decarbonization.

36

37 Ms. Clift talked about a UC Irvine Campus Medical Complex case project that has:

- 38
- 354,000 square feet bed hospital
 - 250,000 square feet Ambulatory Care Center
 - Central utility plant
- 39
- 40

- 1 • Parking structure

2 Mr. Carter discussed the DPP Energy Goals for:

3 Acute Hospital Buildings:

- 4 • 20% better than Title 24 Energy Efficiency Standards 2019 Energy
5 Performance Target: EUI of 160 kBtu/sf/yr

- 6 • Energy Performance Target: EUI of 160 kBtu/sf/yr

7 Clinics and Ambulatory Services:

- 8 • 30% better than ASHRAE 90.1-2010

- 9 • Energy Performance Target: EUI of 87 kBtu/sf/yr

10

11 On hospital electrification, Mr. Carter stated that the heating and the domestic hot water
12 system were required to be electrified on the project. The steam system used gas.

13

14 Mr. Carter said that they proposed a distributed electric steam system. He also talked
15 about heat recovery chillers stating that there are not many vendors available with OSP
16 for this type of equipment, and the equipment has an option for site-specific certification.

17

18 Mr. Carter explained that air source heat pumps have limited equipment available with
19 an OSP and there is an option for site specific certification. The pumps are loud
20 therefore effect location siting.

21

22 Ms. Clift added that the electrical service for hot water had an impact in the CUP,
23 service infrastructure, and generator capacity. Electrical for steam, impact was on
24 hospital and ACC, service infrastructure, and generator capacity.

25

26 Ms. Clift talked about electrical system impact on heating/domestic hot water:

- 27 • CUP electrical infrastructure was greatly impacted
28 • Electric heating/hot water resulted in a 20.6 VA/SF impact over the entire
29 project or a total of 1,329kVa
30 • CUP service infrastructure grew by approximately 1,600 A
31 • CUP generator system grew by approximately 1,400kVa

32

33 Electrical system impact on humidifier/ sterilization:

34

- 35 • The ACC and the hospital electrical infrastructure were greatly impacted
36 • In the ACC, the electric humidification resulted in a 1.67 VA/SF impact or 418
37 kVa. The ACC service infrastructure grew by approximately 500A.

- 1 • In the hospital, the electric humidification/ sterilization resulted in a 13.7VA/SF
2 impact of 485kV. The ACC service infrastructure grew by approximately 582A
3 • The CUP generator system grew by approximately 903kVa.

4

5 The overall electrical system impact:

- 6 • Across the entire square footage of the hospital and ACC, the total electrical
7 heating, humidification, and steam load came in around 3.55 VA/SF.
8 • The CUP/ hospital/ ACC service infrastructure grew by 2,682A.
9 • The CUP generator system grew by approximately 2,303kVa.
10 • The requirement for PV energy to offset at least 10%of the facilities energy
11 consumption per LEED for healthcare increased as well.

12

13 Ms. Clift highlighted on electrification of hospitals impact on electric utility grid:

- 14 • The electric grid is already being pushed to its current capacity with the
15 overall trend to decarbonization/electrification and EV charging.
16 • The project required a dedicated 12Kv circuit from SCE which should take
17 approximately two to three years for SCE to accommodate.
18 • The additional circuit required to accommodate the future phase of the UCI
19 ICMC project will not be ready for six to eight years.

20

21 Mr. Carter explained the various energy efficiencies on:

- 22 • Natural gas fired boilers are 90-95 % efficient (COP 0.9 to 0.95)
23 • Electrical resistant boilers are 100% efficiency (COP 0.1)
24 • Heat pump boilers have an efficiency of COP 2.0 to 3.0

25

26 Mr. Carter stated that natural gas was a relatively low-cost utility in California compared
27 to electric heat.

28

29 **Discussion and input**

30 Mr. Danderkar asked what happens in case of a power outage. Ms. Clift answered that
31 project is still required to be backed up by a generator.

32

1 Mr. Bliss asked how the load stack, which might have skyrocketed demand cost, was
2 mitigated. Ms. Clift answered that there was no implementation of load stack on the
3 electrical system. Mr. Carter added that heat recovery chillers had a positive effect on
4 reducing demand.

5

6 **Information and Action item**

- 7 • None.

8

9 **7. Comments from the public/committee members on issues not on this agenda**

10 **Presenter:** Bruce Rainey, Committee Chair

11

12 **Discussion and input**

13 Mr. Tannahill suggested that a topic on developing technology in which many vendors
14 are requesting that their services reside in the Cloud and not in the hospital building be
15 discussed on future meetings. This may affect patient records, nurse call systems, PBX
16 services. He also asked what allowances should be made for Cloud-based services. Mr.
17 Rainey answered that the committee can have that conversation.

18

19 The future Technology and Research Committee meeting is to be held on 1st
20 November 2022.

21

22 **Information and Action item**

- 23 • None.

24

25 **8. Adjournment**

26 Mr. Rainey adjourned the meeting on July 27, 2022, at approximately 2:14 p.m.