## FOR THE CASE OF Board of Boiler Rules Meeting

TRANSCRIPT OF

B

September 3, 2014

## Stone & George COURT REPORTING

2020 Fieldstone Pkwy

Suite 900 - PMB 234

Franklin, TN 37069

(615) 268-1244

## NOTICE

Unauthorized sharing of this transcript with other law firms is strictly prohibited. To avoid additional charges, usage of this transcript is limited solely to your law firm.

For questions call (615) 268-1244 or send an email to <a href="mailto:nangeorge@stoneandgeorge.com">nangeorge@stoneandgeorge.com</a>

## STATE OF TENNESSEE DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT BOARD OF BOILER RULES

QUARTERLY MEETING OF THE STATE OF TENNESSEE BOARD OF BOILER RULES

September 3, 2014

-----

CASSANDRA M. BEILING, CCR, LCR# 371
STONE & GEORGE COURT REPORTING
2020 Fieldstone Parkway
Suite 900 - PMB 234
Franklin, Tennessee 37069
615.221.1089

1	TNDEV	Page 3
1	INDEX	
2	PAGE	
3	14-09 Vapor Power International 20	
4	14-10 Engineering Services Group, Inc. 43	
5	14-11 James B. Neville presenting for Vi-Jon 84 Corporation	
6		
7	A G E N D A	
8	I. Call to Order	
9	II. Introductions and Announcements	
10		
11	III. Adoption of the Agenda	
12	IV. Interim Chief's Report	
13	V. Old Business (none)	
	VI. New Business	
14	14-09, 14-10, 14-11	
15	VII. Open Discussion Items	
16	* Reorganization of Rule 0800-03-03 - Moving Code Requirements into Tennessee Rules/	
17	Realigning State rules for ease of use by Installers and Owners	
18	* Boiler Operator Legislation - Not feasible	
19		
20	rule cases and interpretations.	
21	IX. The next Board of Boiler Rules Meeting is	
22	December 3, 2014, at the Department of Labor	
23	located at 220 French Landing Drive,	
24		
25	A. Adjournment	
21 22 23 24	IX. The next Board of Boiler Rules Meeting is scheduled for 9:00 a.m. (CT), Wednesday, December 3, 2014, at the Department of Labor & Workforce Development office building	

- 1 personnel in this building will take us, the
- 2 attendees, either to a safe place within the
- 3 building or direct us to a safe place outside the
- 4 building, which would be on the Rosa Parks side of
- 5 the building. So in that event, just so you would
- 6 know that.
- 7 Are there any other announcements
- 8 that I may have left out or introductions?
- 9 (No verbal response.)
- 10 CHAIRMAN MORELOCK: Okay. The
- adoption of the agenda. There's copies on the
- 12 back table if you don't have an agenda. And I
- 13 will open the floor now. Are there any items that
- we need to add to the agenda?
- DR. CANONICO: (Indicating.)
- 16 CHAIRMAN MORELOCK: Yes, sir?
- 17 DR. CANONICO: How about
- 18 membership? With Dr. Campbell -- we probably
- 19 should talk about that.
- 20 CHAIRMAN MORELOCK: Okay. Do you
- 21 mind if I add that as just an open discussion
- 22 item? Would that be --
- DR. CANONICO: Oh, not at all.
- 24 CHAIRMAN MORELOCK: Okay. We'll
- add that to the discussion items. Anything else?

		Page 9
1	(No verbal response.)	rage
2	CHAIRMAN MORELOCK: All right. I	
3	have a very important agenda item to add this	
4	morning. I know it's really not a big surprise,	
5	but hopefully it's a little bit of a surprise.	
6	But I want to add to the agenda the next item,	
7	before the interim chief's report. I would like	
8	to add the recognition of Ed Vance as a previous	
9	Tennessee board member as we wish him well. So I	
10	would like to add that to in between the adoption	
11	of the agenda and chief's report. Any other	
12	items?	
13	(No verbal response.)	
14	CHAIRMAN MORELOCK: Do I have a	
15	motion to accept the agenda as amended.	
16	MR. ROBINSON: So made. So made.	
17	CHAIRMAN MORELOCK: Second?	
18	MR. BAUGHMAN: Second.	
19	CHAIRMAN MORELOCK: All in favor?	
20	(Affirmative response.)	
21	CHAIRMAN MORELOCK: Opposed?	
22	(No verbal response.)	
23	CHAIRMAN MORELOCK: Abstentions,	
24	not voting?	
25	(No verbal response.)	

- 1 CHAIRMAN MORELOCK: All right. We
- 2 have an agenda. So with that, Mr. Vance, if you
- 3 would come forward, please.
- 4 I've got a few stories. I'll let the
- 5 rest of them tell the good ones.
- MR. VANCE: Oh, boy.
- 7 CHAIRMAN MORELOCK: Ed joined the
- 8 Board to replace Clyde Caldwell. Clyde retired in
- 9 June of 2009 -- no, that's not right. It's been
- 10 nine years -- 2005. I apologize. And I came on
- 11 the Board in June and then Ed came on in
- 12 September. That was his first official meeting,
- so he's been on the Board for nine years.
- 14 We're excited for your retirement and
- 15 we hate to lose you on the Board, but I'm going to
- let Kim Jefferson come forward and she's got some
- 17 things she'd like to present to you and say some
- 18 words. But it's been a pleasure.
- MR. VANCE: Thank you. It's my
- 20 pleasure.
- 21 CHAIRMAN MORELOCK: We don't have a
- 22 Corvette for you in the parking lot. You'll have
- 23 to go to Bowling Green for that, but
- 24 congratulations and it's certainly been a
- 25 privilege working with you.

- 1 MR. VANCE: Thank you. Thank you
- 2 very much.
- 3 MS. JEFFERSON: Mr. Vance, I know
- 4 this is our first time meeting today. I just want
- 5 to shake your hand because I've heard so many good
- 6 things about you.
- 7 MR. VANCE: Thank you.
- 8 MS. JEFFERSON: And on behalf of
- 9 the Tennessee Department of Labor & Workforce
- 10 Development, I just wanted to come to you on
- 11 behalf of, also, the Division, Workplace
- 12 Regulations and Compliance Division of the Boiler
- 13 Unit, to honor you today. This is your special
- 14 day. Just to let you know, we appreciate all the
- 15 time, all the hard work, dedication, that you've
- 16 made on behalf of the Board, everything that
- 17 you've done for the unit. We really appreciate
- 18 that.
- 19 And, Deborah, actually, I would like
- for you to come up as well, both you and Sam,
- 21 Carlene, and Mark.
- 22 This is our boiler unit. And Deborah
- has worked with you, both her and Sam, and so if
- 24 you will present that.
- 25 MS. RHONE: I have a plaque that

- 1 says this is from the Tennessee Department of
- 2 Labor and Workforce Development, the Boiler
- 3 Inspection Unit. This is presented to Edwin Vance
- 4 in appreciation for his premier dedication and
- 5 tireless efforts as a member of the Tennessee
- 6 Board of Boiler Rules 2005 until 2014.
- 7 MR. VANCE: Thank you so much.
- 8 Thank you.
- 9 (Applause.)
- 10 CHAIRMAN MORELOCK: Ed, we won't
- 11 make you stay for the whole meeting. You're
- 12 certainly welcome to stay with us.
- 13 (Whereupon, a discussion off the
- 14 record occurred.)
- 15 CHAIRMAN MORELOCK: Ms. Jefferson
- has requested one more agenda item. Jason Beard
- is with us, and we're going to give him a moment
- 18 to provide some update.
- 19 So Jason, you have the floor, sir.
- MR. BEARD: Thank you, Mr. Chairman
- and board members. I wanted to go over a few
- things that affect this Board legislatively.
- 23 Every so often, every department and every board
- or commission attached to a department has a
- 25 sunset date. It's part of the legislative

- 1 oversight function. And this Board actually is
- 2 scheduled to sunset June 30th, 2015.
- 3 Part of that process is that there is
- 4 a sunset audit that the comptroller's office
- 5 conducts. That should be completed at this point.
- 6 And the results have not been released yet, so we
- 7 don't know if there were any findings. We assume
- 8 there would not be, but obviously that's always
- 9 out there, and we'll be paying attention to that
- 10 and keeping the Board in the loop as far as
- 11 anything that comes from that.
- 12 Following those sunset audits, there
- are sunset hearings by the joint government
- 14 operations committee. Those committee hearings
- 15 basically go over the sunset audit findings, if
- any, and also provide the Board a chance to
- 17 approach the committee and explain your function,
- 18 what you do, the value that you bring to the state
- 19 and its citizens.
- 20 Based upon that testimony of that
- 21 hearing, the joint government operation
- 22 subcommittee then makes a recommendation to
- 23 reauthorize the Board, or not, for a period of
- years, whether it be one year if they aren't
- 25 exactly thrilled with the information that they

- get and they want to have a little tighter
- oversight, or up to, I believe, five years is the
- 3 maximum if they feel very comfortable with what is
- 4 taking place with the Board.
- 5 So that is going to be coming up. We
- 6 have not received a date specific as to when the
- 7 hearing, the sunset hearing for this Board will
- 8 be. I do know that it will either be November
- 9 18th at 1:30 p.m. or November 19th at 9:00 a.m.
- 10 Or December 16th at 1:30 p.m. or December 17th at
- 11 9:00 a.m. It will be one of those four dates. So
- as part of that, also, the board members might
- want to discuss one of you being available, to be
- present for that committee meeting, to appear
- 15 before the committee.
- 16 Oftentimes -- a lot of times,
- 17 sometimes, it ends up falling on the department, a
- 18 representative from the department to show up;
- 19 however, it tends to look like it's an entity
- 20 worth supporting if the board members themselves
- 21 deem it important enough to show up before the
- 22 committee. So that's something to keep in mind.
- 23 That's the sunset part.
- 24 Another part also before the
- 25 government operations committee, they have rule

- 1 review. I know we'll be going over some proposed
- 2 rules for the boiler unit today, as I understand.
- 3 Part of that, after those rules are submitted with
- 4 the Secretary of State's office, then they go
- 5 before the government operations committee to
- 6 either be approved or not, depending on whether
- 7 they're controversial or raising red flags to the
- 8 members. They could be put on the consent
- 9 calendar, which means they pretty well pass
- 10 through seamlessly, or they could be on the
- 11 regular calendar, which means they would be open
- for discussion by the committee members.
- 13 Also, with rules, it's advised that a
- 14 representative from the Board be there if
- 15 possible. That one is not quite as important as
- showing up for the sunset hearings because the
- 17 unit here within the department, within the
- 18 workplace regulation compliance division,
- oftentimes have more than sufficient knowledge
- about the actual rule proposal than -- to be able
- 21 to go before the Board and speak knowledgeably
- 22 about it.
- 23 Either way, that would be coming up
- 24 as a prerequisite before the rule going into
- 25 effect. As part of that, just to let the Board

- 1 know, we work those rules in the same way that we
- 2 would work legislation, sponsored by the
- 3 department or the administration during a
- 4 legislative session, meaning that we would meet
- 5 with each of the committee members, explain the
- 6 rule to them, what its effect would be on the
- department or the unit, what its effect would be
- 8 on Tennessee businesses and so forth. So we would
- 9 work that.
- 10 Each committee member would then work
- 11 to be there, present, for the whole committee when
- they meet, and hopefully it would be approved and
- 13 go on for passage.
- I believe those are the only two
- 15 items that I had to present. If there are any
- questions, I would be happy to address those.
- MS. JEFFERSON: Jason, I have one
- 18 question. So you said we need a contact person
- from the Board, so we'll have to provide that
- 20 information to you. Is there a particular time
- 21 that you want us -- do we have a time frame to
- 22 provide that in preparation?
- 23 MR. BEARD: Usually, one week. The
- 24 committee would like that information, who will be
- 25 showing up, who will be speaking, at least one

- 1 week before the date that we are set to go before
- 2 the committee.
- 3 MS. JEFFERSON: Okay. Also, as far
- 4 as presentation, will we be expected to do a
- 5 PowerPoint presentation, or how will that work?
- 6 MR. BEARD: Oftentimes -- and I
- 7 believe I sent out an email yesterday that had a
- 8 specific list of questions that may or may not
- 9 apply to the function of this Board. However, one
- 10 of the representatives on this committee has a
- 11 specific set of questions that he likes to have
- answered for every sunset hearing. Ms. Jefferson
- can provide the Board with that. And if you-all
- have any thoughts as far as answers to those, it's
- 15 basically on -- focused on performance indicators
- 16 and measures.
- 17 I'm not real sure how to go into more
- 18 detail on that. But they basically -- it would be
- 19 part of any presentation. A PowerPoint is not
- 20 necessary; however, this particular representative
- 21 does like to see things charted out and graphs and
- 22 colors and things of that sort. But that could be
- part of the presentation if the Board so deems.
- 24 CHAIRMAN MORELOCK: Okay. Any
- other questions or comments?

- 1 (No verbal response.)
- 2 CHAIRMAN MORELOCK: I will just
- 3 say, as far as the potential meetings on November
- 4 the 18th or 19th, Dr. Canonico and myself will be
- 5 at ASME code week meetings during that time frame.
- 6 That code week is November the 17th through the
- 7 21st. So as soon as we know a definite date, we
- 8 can poll the board members to see who can make the
- 9 presentation, who can attend.
- 10 Are there any other conflicts with
- any of those four dates from any of the other
- 12 board members at this time? And we don't have to
- know today, but we'll work on that.
- MR. BEARD: As soon as the
- committee assigns a date to us, I'll be sure and
- 16 get it out as soon as I have it.
- 17 CHAIRMAN MORELOCK: Okay. All
- 18 right.
- MR. BEARD: Legislatively, I don't
- 20 know of any bills that are up that would affect
- 21 the boiler unit this time around, but we didn't
- 22 know that last year either, so we'll keep the
- 23 Board informed as to any of those developments
- 24 that come up.
- 25 CHAIRMAN MORELOCK: Anything else?

		Page 19
1	(No verbal response.)	
2	CHAIRMAN MORELOCK: Jason, thank	
3	you.	
4	MR. BEARD: Thank you.	
5	CHAIRMAN MORELOCK: Moving on to	
6	our next agenda item. That would be the interim	
7	chief's report.	
8	MR. CHAPMAN: All right. Thank	
9	you, Chairman. Number of inspections done was	
10	9,166; total delinquent for the state inspectors	
11	is 918; the insurance agency is 1,168, bringing	
12	our total of delinquent to 2,086.	
13	Number of code violations was 36	
14	found; 8 of them was uncorrected.	
15	QC review performed was two, and	
16	there was no boiler variance at this time.	
17	And that concludes the interim	
18	chief's report.	
19	CHAIRMAN MORELOCK: Thank you.	
20	Any questions or comments?	
21	(No verbal response.)	
22	CHAIRMAN MORELOCK: Hearing none,	
23	Item V is Old Business. We have no old business	
24	on the agenda at this meeting.	
25	Moving along to Item VI, New	

- 1 Business -- as we go through the business items,
- 2 any board member that would have a conflict of
- 3 interest on each particular item, I'll ask for --
- 4 I'll ask at the beginning of each item if there is
- 5 a conflict of interest. Please so note that
- 6 before we enter into the presentation and
- discussion of that item.
- 8 So moving along, our first item of
- 9 new business is Item 14-09, Vapor Power
- 10 International. And when you have an item, ladies
- and gentlemen, please come to the table. You'll
- 12 have the floor. Introduce yourself again and then
- present your item, and then we'll bring it forward
- for action, discussion and all of that.
- 15 So Vapor Power International, you-all
- 16 have the floor.
- 17 MR. DUPUIS: Thank you. First, I
- 18 would like to thank the Board for the opportunity
- 19 this morning. Our request is, I guess, to get
- 20 clarification for the attendance requirement for
- 21 our Circulatic product. Our Vapor Power
- 22 Circulatic can be manufactured as a
- 23 high-temperature hot-water boiler or a
- 24 high-temperature fluid heater in similar fashion
- 25 to another manufacturer's design that was reviewed

- 1 by the Board in case BC92-06. And as a result,
- 2 Vapor Power would like to gain the same
- 3 consideration for our Circulatic product in
- 4 Tennessee as a unit that when properly constructed
- 5 as an ASME Section I high-temperature hot-water
- 6 boiler is not subject to the attendant Rule
- $7 \quad 0800-3-3-.04(22)$ .
- 8 So I had sent some information to
- 9 Mr. Morelock in advance for -- with our request to
- 10 be included with the agenda, and I would be happy
- 11 to discuss any questions on that information and
- 12 go through any further product information that
- may be useful.
- 14 CHAIRMAN MORELOCK: Could you
- present this to -- I mean, the need here is --
- 16 could you present this to show the Board how your
- 17 product satisfies the exemption that you would
- 18 like to claim.
- MR. DUPUIS: Okay. Well, the
- 20 exemption, as I understand it, is that if the
- 21 product is classified as a high-temperature fluid
- heater or a high-temperature hot-water boiler,
- then it's not subject to the attendant rule.
- 24 CHAIRMAN MORELOCK: Okay.
- MR. DUPUIS: And so with that, our

- 1 product is one that -- the Circulatic product is
- 2 manufactured as a -- can be manufactured as an
- 3 ASME Section I high-temperature hot-water boiler
- 4 with its unique manufacturer's data report. And
- 5 then we would have a remote flash separator that
- 6 also is its unique and individual component with a
- 7 manufacturer's data report, as a master.
- 8 And the combined package is a skid
- 9 package, as such, again, similar to the
- 10 manufacturer. And the manufacturer is Clayton,
- 11 their Model DZ, they advertise as a
- 12 high-temperature fluid heater. We manufacture our
- 13 Circulatic product similar in nature and function.
- 14 And I think probably the most
- important case, compared to a competitive
- situation, is the fact that ours were following
- 17 the ASME Section I Code. We have the appropriate
- 18 paperwork with the equipment for each component as
- 19 a high-temperature hot-water boiler. So that's, I
- 20 quess, the beginning of it.
- 21 So the information that I provided
- were a couple of drawings. One was a general-
- arrangement drawing that shows the physical
- 24 appearance of that package, and then the second
- 25 was a piping schematic that showed where those --

- 1 it showed the componentry on both fuel train and
- 2 piping side. But within that piping diagram, it
- defines the code boundary with the appropriate
- 4 isolation valves and the appropriate ASME
- 5 Section I high-temperature hot-water service
- 6 relief valve, water relieve valve. And then from
- 7 there, there's piping up to the remote flash
- 8 separator tank that also has its code-appropriate
- 9 steam safety valve.
- 10 CHAIRMAN MORELOCK: Do I have a
- 11 motion for this item so we can enter into
- 12 discussions?
- DR. CANONICO: So made.
- 14 CHAIRMAN MORELOCK: Okay. So I
- 15 have a motion to approve this request. Do I have
- 16 a second?
- 17 MR. ROBINSON: I second.
- 18 CHAIRMAN MORELOCK: Okay. I'm
- 19 opening the floor now for discussion. What
- 20 questions or comments do you have?
- 21 MR. BAUGHMAN: Sir, on the P3 Data
- 22 Report, it's listed as a hot-water generator. And
- we're generating steam with this, correct?
- MR. DUPUIS: We are not generating
- 25 steam with the hot-water generator. The steam is

- 1 created after the code boundary of the hot-water
- 2 generator in the remote flash separator tank.
- 3 MR. BAUGHMAN: Is that remote flash
- 4 separator tank then identified as a particular
- 5 vessel in itself that's separate from this
- 6 generator? In other words, does it fall under its
- 7 own code requirement as far as unfired vessel?
- 8 MR. DUPUIS: Yes. Yes. It
- 9 has its own P3 manufacturer's data report. We've
- 10 historically done it as a Section I separator
- 11 tank. Technically, we could do it as a
- 12 Section VIII, as an unfired pressure vessel. But
- it is definitely an unfired vessel.
- MR. BAUGHMAN: So according to our
- 15 code, it would be classified as an unfired steam
- 16 boiler intended for operation at a pressure in
- 17 excess of 15 PSI; is that correct?
- MR. DUPUIS: The remote
- 19 separator -- I mean --
- 20 MR. BAUGHMAN: Yes or no. Can it
- 21 operate above 15 PSI?
- MR. DUPUIS: Yes. Oh, yes. Yes,
- 23 it definitely does.
- 24 MR. BAUGHMAN: Then it would be
- 25 classified, then, as an unfired steam boiler,

- 1 would it not, according to our code and
- 2 definition?
- MR. DUPUIS: It would not be an
- 4 unfired steam boiler, I guess. Well, I apologize
- for not having exact -- your code memorized, but
- 6 per ASME code, it's an unfired pressure vessel.
- 7 MR. BAUGHMAN: Okay. Well, in our
- 8 code, it states unfired steam boiler means an
- 9 unfired pressure vessel or system of unfired
- 10 pressure vessels intended for operation at a
- 11 pressure in excess of 15 PSI steam for the purpose
- of producing and controlling an output of thermal
- energy. And it sounds like it falls within that
- 14 definition.
- 15 MR. DUPUIS: I guess, yeah, not
- having it in front of me, I would have to review
- 17 that in greater detail if I could.
- 18 MR. BAUGHMAN: I'm just trying to
- 19 get an idea and clarification. If we've got a
- 20 hot-water generator that is then flashing to steam
- 21 and being collected into another vessel, which is
- 22 an integral part of this particular device or
- 23 system --
- MR. DUPUIS: Well, it's part of the
- 25 system. It doesn't have to be. We can provide a

- high-temperature hot-water boiler for -- you know,
- 2 without that remote vessel as well.
- MR. BAUGHMAN: But for the purpose
- 4 of collecting steam in whatever application it's
- 5 being applied to, we'd have to have this
- 6 particular accumulator or a flash tank or
- 7 whatever.
- 8 MR. DUPUIS: In order to actually
- 9 produce steam, yes, you would have to have this
- 10 separate vessel for the flashing to occur.
- MR. BAUGHMAN: Okay.
- 12 CHAIRMAN MORELOCK: Any other
- 13 questions?
- 14 MR. ROBINSON: If there was an
- 15 event, a catastrophic event, what would be some
- 16 probable events that you would recognize
- 17 immediately?
- 18 MR. DUPUIS: That's a real good
- 19 question. And the answer to that is the physics
- 20 behind the design of our Circulatic design is,
- one, that it's low-water volume. It's not
- 22 possible to have a water side explosion event.
- 23 There isn't enough stored energy in the design to
- 24 have that occur. So if there is a failure in the
- 25 pressure vessel itself, then the result is a small

- 1 steam leak as it hits atmosphere and a water leak
- on the floor. There isn't the stored energy in
- 3 the design to have the boiler go through the wall.
- 4 It's simply not there. The water content isn't
- 5 there. And since you don't have the water content
- 6 and you don't have the stored energy, a rupture,
- 7 compared to a fire 2 boiler where the pressure
- 8 vessel is the outer jacket, ours is a water tube
- 9 design. The typical coil, the heat transfer coil
- 10 diameter is roughly two inches on many of our
- 11 products. It's a 2.125-inch OD with a .15-inch
- 12 min wall.
- 13 If you have a rupture in one of those
- 14 coils, then the size of that rupture is relatively
- 15 small. And, again, without the stored energy and
- 16 because of the low water volume, you can't have an
- 17 explosive event. The energy is just not there.
- 18 So it's an inherently safe design.
- MR. ROBINSON: What protection
- 20 devices would detect a small leak or possible ...
- 21 MR. DUPUIS: Another good question.
- We have -- each of the individual coils has
- 23 thermocouple temperature protection. So if there
- is any -- if any of the individual coils exceed a
- 25 preset temperature set point, then the unit will

- 1 go into an alarm condition that requires manual
- 2 reset. And then the separator tank also has level
- 3 controls, and then there is the safety valve, the
- 4 water relief valve on the Circulatic product
- 5 itself, and then the steam relief on the remote
- 6 separator tank. And then, beyond that, the
- 7 standard FM and CSD-1 with NFPA 85, if applicable
- 8 to the size, all those common safeties would all
- 9 be present on the fuel side.
- 10 MR. ROBINSON: So the burner -- let
- 11 me just get -- 6,902 pounds of steam. So the
- 12 burner is set under the controls of CSD-1 --
- MR. DUPUIS: In that case, yes.
- MR. ROBINSON: -- for that output.
- MR. DUPUIS: Correct. We have a
- 16 variety of sizes. Our smallest is 75 boiler
- 17 horsepower. Our largest is 600 boiler horsepower.
- 18 So roughly 2 million BTUs to 20 million BTUs in
- 19 general size range and 2.5 million BTUs to
- 20 20 million BTUs in general size range. So
- 21 depending on the capacity of the unit, then the
- 22 appropriate code would be followed for the fuel
- 23 side safeties.
- MR. ROBINSON: Final question:
- 25 What kind of wear and tear would you be able to

- detect, and would you be inclined to do a yearly
- inspection internally for that unit? Now, I know
- 3 it's difficult because of tubing being
- 4 approximately two inches in diameter. But there
- 5 are methods out there that NBIC recognizes.
- 6 MR. DUPUIS: Oh, yeah. No. That's
- 7 another good question. Our design is one that
- 8 we've made it relatively easy to do a water side
- 9 inspection with our design. Our individual coil
- 10 connections are external to the body of the unit.
- 11 So there are -- our coil inlet manifold and the
- 12 piping that enters into the body has T's so you
- can remove the plug from those T's when it's in a
- 14 cold condition, of course. And that way you
- 15 can -- when you remove that plug, you can do the
- water side inspection very simply on the external
- 17 body of the unit without having to go in and make
- 18 a more intrusive inspection. So it's inherent to
- 19 our design as well.
- 20 Fire side inspection is relatively
- 21 simple. The burner can be removed from the front
- 22 end of the unit. And, also, we have a back door
- on the back of the unit that can be removed for
- fire side inspection both on the internal coil
- 25 surfaces and the external coil surfaces. So yes,

- I would recommend a -- as a manufacturer, we do
- 2 recommend an annual inspection on the equipment
- 3 just for the general wellbeing of it.
- 4 CHAIRMAN MORELOCK: Any other
- 5 questions or comments?
- 6 MR. BAUGHMAN: From a flow
- 7 standpoint, I take it that the pump is a critical
- 8 part of the component of this operation. What's
- 9 the most common problem that you find on these
- 10 coil-type units?
- MR. DUPUIS: Well, you are correct
- that the pump is a critical component to the
- operation. And that's why we do have the coil
- 14 temperature controls on each individual coil so
- 15 that if we do sense a lack of flow or incorrect
- heat transfer, that we do have an alarm safety for
- 17 that.
- You know, I mean, as far as --
- it's -- the most common? It's hard to say
- 20 exactly.
- 21 MR. BAUGHMAN: Coil failures from a
- 22 flow standpoint or low water --
- MR. DUPUIS: Coil failures are
- 24 fairly rare for us just with our design. Our
- 25 design is a little bit -- it's a -- granted, I

- 1 have a biased opinion, working for the
- 2 manufacturer. But I believe we've got a better
- design and more robust design than the other
- 4 manufacturer that's named in case BC92-06. We
- 5 have a thicker-coil wall, as one example, and our
- 6 pump flow rate is a different flow rate. Our flow
- 7 is four times that of the steaming rate of the
- 8 remote separator. The other design that has been
- 9 granted the ruling, they designed their pump for
- about 1.25 or 1.3 times the evaporation. So I
- think with our design, we're getting a higher
- 12 water flow.
- 13 You know, generally in the
- 14 marketplace, lower water volume boilers are --
- some of them have a reputation for requiring
- 16 perfect water treatment. Granted, we'd like
- 17 perfect water treatment, but in reality, we don't
- 18 often see that. And so, you know, ours is a more
- 19 forgiving design with that since we have designed
- the pump for a four-time circulation rate.
- 21 Therefore, the scale dropout is going to occur in
- that remote drum. So if there is any hardness in
- 23 the boiler feed water, also, you know, that serves
- 24 as the entry point for boiler feed water, so
- 25 there's a better resistence to any oxygen

- 1 corrosion with our Circulatic design compared to
- other high-temperature hot-water boilers.
- MR. BAUGHMAN: On the temperature
- 4 control, since the temperature monitoring of that
- 5 coil is very intricate to the safety of the
- 6 system, they are manual reset, but knowing that
- 7 that has been issues over the years, is there
- 8 safety built into that system to where those
- 9 temperature controls cannot be jumped out? In
- other words, does the system identify it to where
- if that temperature becomes a nuisance, in other
- words, and is locking out, is there a safety built
- into the system to recognize that that control is
- 14 jumped out?
- MR. DUPUIS: We do this commonly
- through a PLC. So the thermocouples will go into
- 17 a thermocouple input card on our PLC, and the
- temperature set points can't be adjusted or
- 19 defeated without having access to the PLC program.
- 20 And as a manufacturer, we don't give out the PLC
- 21 logic to our clients. Therefore, it makes it
- 22 quite difficult to defeat those safety controls.
- MR. BAUGHMAN: Good.
- MR. ROBINSON: Where in proximity
- 25 are those temperature indicators or sensors?

1 MR. DUPUIS: Another good question. 2 They are in the coil outlet piping. So it's in 3 the high-temperature zone of the unit. So our coil design has a seven-layer concentric layer 4 5 design, and the flow pattern goes from outside to 6 inside through those seven concentric layers. And then the coils go up and out. And when it makes 8 that turn out is where we have what we call our sensor pipe. And the thermocouple is embedded in 9 10 that sensor pipe. So it's in the combustion zone. 11 It's not external to the combustion area, so it is recognizing the hottest possible temperature for 12 the exit of the unit. So we've determined that's 13 the safest and most accurate temperature reading 14 15 point for those safety controls. 16 MR. ROBINSON: What is that temperature, might I ask? Just give me a number 17 18 as far as what temperature are you seeking to allow to continue to operate. 19 20 MR. DUPUIS: Typically it's going 21 to be an exit temperature of around 400 degrees 22 Fahrenheit, as an example. And in that case, our 23 alarm set point will be 550 degrees Fahrenheit. 24 CHAIRMAN MORELOCK: Any other --

MR. ROBINSON: Let me ask you, have

25

- 1 you ever had any thermocouples to fail?
- MR. DUPUIS: It's extremely rare
- 3 for a thermocouple to fail.
- 4 MR. ROBINSON: But you --
- 5 MR. DUPUIS: But we do have them on
- 6 each individual coil. The coils are connected in
- 7 parallel, so --
- 8 MR. ROBINSON: Redundancy?
- 9 MR. DUPUIS: Yes. Yes. So --
- 10 well, not truly redundancy, I guess. But you do
- 11 have individual coil protection. So with the
- coils connected in parallel, it's generally
- assumed that -- and they're equal coils, too, I
- 14 might add -- so you have the assumption of equal
- 15 flow through each individual coil, and, therefore,
- the coil temperature results should be similar
- 17 readings across the range of coils.
- 18 And so it's not redundancy in that
- there's a backup to each of them, but it is
- 20 somewhat redundant because you've got -- you know,
- if you have four coils, you've got four
- temperature controls rather than just one
- 23 temperature control with the assumption that the
- other three are in a similar condition. So that
- 25 way if there is one of them that has any kind of

- 1 following for whatever the reason may be, then it
- will go into alarm for just that one.
- MR. BAUGHMAN: We're talking about
- 4 high-temperature fluid heaters. And in high-
- 5 temperature fluid heaters, are we actually talking
- 6 about thermal fluid heaters?
- 7 MR. DUPUIS: We do make thermal
- 8 fluid heaters as well. That is a separate
- 9 product. So our Circulatic product is the
- 10 high-temperature hot-water boiler. We make, under
- our trade name, HI-R Temp, we make a thermal fluid
- 12 heater as well.
- MR. BAUGHMAN: Well, the reply in
- our Tennessee Boiler Rules cases was specific to
- 15 the opinion of the Board that they were looking at
- 16 a high-temperature fluid heater and not a -- and
- 17 they were classifying the high-temperature fluid
- heater, i.e., a thermal fluid heater, as a
- 19 high-temperature hot-water boiler, and it didn't
- 20 fall under the Rule 22 attendance clause.
- 21 So in particular, that's where the
- opinion came out on this, from the way that I read
- it, is that it related to a thermal fluid or
- 24 high-temperature fluid heater, not so much in
- 25 taking a hot-water generator or a high-temperature

- 1 hot-water boiler. And so I'm wanting to make sure
- 2 that there's a differentiation or that I'm
- 3 understanding this right.
- 4 MR. DUPUIS: Yeah. I guess if I
- 5 could -- I'm sorry. Go ahead and finish and then
- 6 I'll --
- 7 MR. BAUGHMAN: No. I'm just
- 8 needing a clarification in my own mind, because as
- 9 I'm reading this, I'm getting high-temperature
- 10 fluid heater as the reply and not so much -- we're
- 11 not talking about a thermal fluid heater in your
- 12 particular case.
- 13 MR. DUPUIS: We are not. And we're
- 14 not talking about a thermal fluid heater in the
- 15 case of the Clayton model DZ. That is not a
- 16 thermal fluid heater. Their product literature --
- I mean, I know them from many, many years of
- 18 experience there. Their product literature for
- 19 the DZ fluid heater specifically says on the front
- 20 cover page, ensure high quality steam, provide
- 21 greater than 99.5 percent quality steam.
- 22 By the fact that we also manufacture
- thermal fluid heaters, I know my competitors quite
- 24 well in the thermal fluid arena, and I know I've
- 25 never competed against Clayton on a thermal fluid

- 1 heater. And I do on a very regular basis when
- 2 we're talking about, you know, these -- they call
- 3 it a fluid heater. I call it a high-temperature
- 4 hot-water boiler.
- 5 MR. BAUGHMAN: Well, and I'm just
- 6 saying that I'm wondering if this particular
- 7 BC92-06 didn't relate to a thermal fluid heater,
- 8 same thing as a Fulton or any of those that make a
- 9 fluid heater --
- MR. DUPUIS: Right.
- 11 MR. BAUGHMAN: -- if this case
- 12 wasn't based around that so much as --
- MR. DUPUIS: Well, I would say that
- it couldn't have been because Clayton never has
- 15 manufactured a thermal fluid heater.
- MR. BAUGHMAN: Got you.
- MR. DUPUIS: So it was most
- 18 certainly regarding a high-temperature hot-water
- 19 boiler, as they called it, a fluid heater. But it
- 20 definitely -- their intent never was and never has
- 21 been to sell it as a thermal fluid heater.
- MR. BAUGHMAN: True.
- 23 MR. DUPUIS: They've always sold
- their model DZ unit with the remote separator in a
- 25 similar fashion.

1 CHAIRMAN MORELOCK: Thank you very 2 much. Now, if I may have just a brief moment for 3 some comments. 4 Reading the Board's opinion from the 5 BC92-06 item, it says at the end, in the opinion 6 of the Board, that a high-temperature fluid heater, such as the Clayton model DZ, is 8 classified as a high-temperature hot-water boiler and is not subject to Rule 22, just paraphrasing. 9 10 And this is why I asked at the 11 beginning of this item. If you go into ASME 12 Section I, in the preamble, Footnote 4, as well as 13 PG-2.2, states that in order to classify as a high- temperature hot-water boiler, it is intended 14 15 for the operation at pressures in excess of 160 16 PSIG and/or temperatures in excess of 250 degrees 17 Fahrenheit. That is a classification that the 18 ruling was made for the Clayton item. 19 Now, in reviewing Vapor Power's literature and information, your coils operate 20 21 certainly at temperatures exceeding 250 degrees 22 Fahrenheit, and the pressures of those coils range 23 from 1275 1000 PSIG pressure. So that would 24 pretty much cement you into the definition of what 25 we're seeking here. My only clarification is, is

- in your schematic, Item 221A is listed as the
- 2 boiler drum. Is that what you are considering to
- 3 be the unfired pressure vessel that may or may not
- 4 be part of your heater?
- MR. DUPUIS: That's correct.
- 6 CHAIRMAN MORELOCK: Okay. Sc
- 7 that's where you flash --
- 8 MR. DUPUIS: That is where the
- 9 flashing and creation of steam takes place.
- 10 CHAIRMAN MORELOCK: Okay. And the
- 11 reason I say that is because, being nitpicky, on
- 12 your P3 and your P7, that vessel is limited to
- 13 150 PSI, which falls out of the definition of the
- 14 high-temperature hot-water boiler.
- 15 But with that said, I compared your
- literature to what was approved in this Ford case
- 17 and the current Clayton model DZ, which is a model
- 18 E204-DZ fluid heater 200 BHP, has very similar
- 19 numbers to yours. So that's the closest I could
- find to compare to your unit. And so the State
- 21 would declare that that would not fall under the
- variance rule -- or it wouldn't fall under Rule
- 23 22. It would exempt it, and that's what you're
- 24 seeking, correct?
- MR. DUPUIS: Correct.

- 1 under the requirement of Chapter 0800-03-03-
- 2 .04(22), which also is the attendant rule. These
- 3 boilers are located at the Morristown Hamblen
- 4 medical center.
- 5 Gentlemen, if you'll come forward.
- 6 Are there any conflicts of interest
- 7 on this item?
- 8 (No verbal response.)
- 9 CHAIRMAN MORELOCK: Hearing none.
- 10 Gentlemen, if you'll introduce
- 11 yourselves and present your item.
- 12 MR. HUDGINS: I'm Ernest Hudgins
- 13 with Engineering Services Group.
- MR. BENSON: Jeff Benson with
- 15 Covenant Health representing Morristown --
- THE REPORTER: I'm sorry?
- 17 MR. BENSON: With Covenant Health.
- 18 Morristown Hamblen is a hospital and I represent
- 19 the organization.
- 20 MR. HUDGINS: As stated we're here
- 21 requesting a variance to the boiler and unfired
- 22 pressure vessel rules and regulations, Paragraph
- 23 0800-3-3-.04(22).
- 24 Morristown Hamblen Hospital is a
- 25 hospital located in Morristown, Tennessee. It's

- 1 approximately 400,000 square feet. It has two
- 2 high-pressure boilers, one which was just recently
- 3 installed and has been in operation since May of
- 4 this year. The older boiler was installed in
- 5 1982.
- 6 The hospital, under its previous
- 7 ownership, had requested and obtained a variance
- 8 back in, I guess, the early '90s for the -- for
- 9 the 20-minute rule. Since the boiler was
- 10 replaced, we understood that that variance was no
- 11 longer in effect. Since the installation of the
- new boiler, the hospital has been operating under
- 13 the 20-minute rule.
- As a part of this manual, it's
- divided up into, I guess, three work categories.
- 16 There's a boiler technician which is a trained
- 17 individual that's responsible for the day-to-day
- 18 maintenance, starting and stopping of the boiler.
- 19 The second is a boiler attendant, a
- 20 person that is only trained to monitor the boiler.
- 21 He is not qualified to make repairs of any sort.
- In the event of an upset condition, he can only
- shut the boiler down. He is not allowed to
- 24 restart it under any circumstances. It's his
- 25 responsibility to call in the boiler technician to

- 1 do that.
- 2 And then the PBX operators whose
- 3 responsibility is to monitor the control panel
- 4 located in the PBX. In the PBX there are other
- 5 life safety items as well as the boiler panel,
- 6 medical, gas, fire alarm system.
- 7 For this boiler variance, we are
- 8 proposing to use the fire alarm system to transmit
- 9 the signals from the boiler to the panel. It is a
- 10 Honeywell fire alarm system. It is a hard-wired
- 11 system, not wireless, and it is supervised, so if
- 12 there's a break in the wire or communication or
- failure of the device, it will also alarm to
- 14 ensure that it's functioning as it should.
- 15 Contained in the manual is the
- location of the boiler room in respect to the PBX.
- 17 It's approximately 400 feet travel distance from
- 18 the boiler room to the PBX. Also contained in the
- 19 manual is a schematic showing the -- excuse me --
- showing the piping schematics and boiler plant
- 21 layout.
- 22 Also contained in the manual, we've
- included for reference the operating -- the
- 24 manufacturer's operating data for the flame
- 25 control system. The new boiler utilizes a

- 1 Honeywell system. The existing boiler is an old
- 2 Fireye system. But I have included that as part
- 3 of the manual for reference. Also included in
- 4 there are the manufacturer's stated alarm faults.
- 5 We understand that some of those alarms will shut
- 6 the boiler down, such as a bad light. So we
- 7 understand that we will have more, I guess -- not
- 8 really a false alarm, but a noncritical alarm that
- 9 will cause the system to generate an alarm at the
- 10 PBX, and the boiler will be shut down. Because,
- 11 you know, you don't know what type of alarm is
- 12 being generated until the boiler attendant on duty
- 13 visits the site.
- 14 The boiler room is equipped with two
- emergency shut-down buttons. One is located
- inside the boiler room. That is located inside
- 17 the boiler room because access to the boiler room
- is from a public corridor. We located it right
- inside the door to prevent patients' family from
- 20 shutting down the boiler accidentally.
- The second one is located at the main
- 22 entrance to the boiler room from the outside.
- 23 Also included in the manual are the
- job descriptions for the boiler technicians,
- 25 boiler attendants, and the PBX operators. Also

- included is a checklist that we're proposing be
- filled out at the beginning of the shift and then
- 3 every four hours. This hospital, they do
- 4 eight-hour shifts.
- 5 CHAIRMAN MORELOCK: Before we get
- 6 to the discussion, do I have a motion for this
- 7 item?
- 8 MR. BAUGHMAN: So moved to pass.
- 9 CHAIRMAN MORELOCK: So we have a
- 10 motion to approve this variance as we always do
- 11 based on the caveat -- or a contingency based upon
- 12 an acceptance inspection by the interim chief
- inspector or the deputy inspector once they make a
- site visit to make sure the manual and what's
- 15 being performed in the field match. So I have a
- 16 motion for that. Do I have a second?
- MR. ROBINSON: Second.
- 18 CHAIRMAN MORELOCK: I do have a
- 19 second. Now, I'm opening the floor for
- 20 discussion. Who has comments?
- 21 MR. BAUGHMAN: You mentioned that
- this had a previous variance.
- MR. HUDGINS: Yes.
- MR. BAUGHMAN: Do we have a copy of
- 25 that previous variance?

```
1
                     MR. HUDGINS: I do not have one
 2
      with me. It was provided on -- I don't know who
 3
      provided it. It was only, like, a three- or
 4
      four-page --
 5
                     MR. BENSON: The one that I --
 6
      actually, I sent a cover sheet of it. It's old.
 7
                     MR. BAUGHMAN: Well, we get renewed
      every three on our variance, and so that's -- and
8
9
      you made a comment that this was issued back in
10
      the '90s.
11
                     MR. HUDGINS: It may be late '80s,
12
      early '90s. I think it was one of the first ones.
13
                     MR. BAUGHMAN: Okay. I would be
14
      interested in that documentation renewal had there
15
      been any -- did that renewal ever not get
16
      reapproved for any particular reasons. I would
17
      just be interested in that information. So I'm
18
      curious on that. But at the other end, on your
19
      drawing SD-1 titled Boiler Variance Site Plan A,
      in the boiler room drawing there, how many boilers
20
21
      do you see in that boiler room?
22
                     MR. BENSON: It's showing three
23
      locations. Or is that a DA?
24
                     MR. HUDGINS: That's a DA.
25
                     MR. BAUGHMAN: Okay. I just wanted
```

- 1 to make sure because it shows a steam header
- 2 coming across it as if it would be possibly part
- 3 of that.
- 4 In SD-3, I'm looking at the
- 5 mechanical boiler room drawing, and you say that's
- 6 a DA, but I don't see the DA. I do see where
- 7 there's a 6-inch rental boiler connection coming
- 8 across the top of the boiler. But I'm just a
- 9 little -- the drawings don't quite match up to
- 10 each other.
- MR. HUDGINS: They don't. We'll
- 12 take care of that. I don't know why they don't
- match up.
- 14 MR. BAUGHMAN: I don't either.
- 15 That's why I was asking.
- MR. BENSON: Is it the location of
- 17 the DA tank?
- 18 MR. HUDGINS: I can't really tell
- 19 from this. But there are just two boilers. The
- 20 boiler B1 that's shown on SD-1 is the new boiler.
- 21 MR. BAUGHMAN: That's the Superior?
- MR. HUDGINS: That's the Superior
- 23 boiler.
- MR. BAUGHMAN: And it was
- 25 actually -- that's a 2013 that actually went into

- 1 service May of 2014.
- MR. HUDGINS: Yes, sir. There was
- 3 some delays in the air pollution permitting that
- 4 by Tennessee law you cannot install the boiler
- 5 until you have the permit approved, in your hand.
- 6 MR. BAUGHMAN: So this came under
- 7 the LoNox requirements.
- 8 MR. HUDGINS: It came underneath
- 9 the LoNox requirement. The DA tank, DA-1, was
- 10 installed at the same time that the boiler of one
- was installed, and then B2 is the old 1982 ...
- MR. BAUGHMAN: Okay. Is there any
- equipment description in here on the DA by chance?
- 14 MR. HUDGINS: No, sir, there's not.
- 15 But we could include it.
- 16 MR. BAUGHMAN: Just interested.
- 17 Since you've got a rental boiler connection there,
- 18 was there a rental boiler previously connected in
- 19 the service?
- MR. HUDGINS: No, sir.
- MR. BAUGHMAN: Okay.
- MR. HUDGINS: It's just there for
- emergency preparedness.
- 24 MR. BAUGHMAN: Should a rental
- 25 boiler go in, how is it going to be operated?

- 1 MR. HUDGINS: It would have to be
- 2 operated under the 20-minute rule.
- 3 MR. BAUGHMAN: Is there any plan on
- 4 upgrading since you've got one old E110 Fireye
- 5 programmer on there and an RM7800 programmer on
- 6 the new boiler? Since we've got two noncongruent
- 7 programmers that enunciate differently, I'm
- 8 wondering how -- since we enunciate differently on
- 9 both of those programmers, how does the PBX
- 10 separate that out and --
- 11 MR. HUDGINS: At the PBX there's a
- 12 separate set of lights and alarms for the new
- 13 boiler and a separate set of lights and alarms for
- 14 the existing boiler.
- MR. BAUGHMAN: Okay. And we're
- saying that not all alarms create a shutdown.
- 17 MR. HUDGINS: Correct. But it
- 18 would --
- MR. BAUGHMAN: Who --
- MR. HUDGINS: But it would generate
- 21 an alarm that would go to the PBX and then the PBX
- operator would shut that boiler down because they
- 23 had gotten an alarm. And they are --
- MR. BAUGHMAN: So regardless of the
- 25 alarm that it enunciates, they're going to shut

- 1 the boiler down.
- 2 MR. HUDGINS: They're going to shut
- 3 the boiler down.
- 4 MR. BAUGHMAN: Regardless.
- 5 MR. HUDGINS: Regardless. Because
- 6 they do not know what the alarm is until the
- 7 boiler attendant goes.
- MR. BENSON: They're trained that
- 9 it's an automatic manual shutdown if they have any
- 10 alarm.
- 11 CHAIRMAN MORELOCK: Any other
- 12 questions or comments?
- Dr. Canonico?
- DR. CANONICO: You say on page 4 --
- 15 I believe I have the right one -- on page 4 in the
- training, you say the personnel will initially
- 17 receive 16 hours of training on the operation of
- 18 the monitoring of the boiler generator, et cetera.
- 19 Who gives that training and how well are they
- 20 trained?
- MR. BENSON: Can I speak to that?
- MR. HUDGINS: Yes.
- 23 MR. BENSON: The team leader and
- the manager of that hospital provide that
- training. And both of those, combined, have

- 1 probably 30 years experience in the hospital
- 2 maintenance and engineering department and I feel
- 3 are well trained in that.
- 4 And we've produced with those guys in
- 5 what we've -- through the boiler company -- a
- 6 manual for them to do their written work through.
- 7 And they do a test with that. And then part of
- 8 that 16 hours is training, but then just drilling
- 9 them on the emergency response and what to do in
- 10 those events.
- Now, the part of the training that we
- 12 also do is a DVD that we put together with one of
- the boiler companies where one of the boiler
- technicians working for one of the larger boiler
- 15 companies here in Tennessee provided instruction,
- and we recorded that and utilized that also.
- 17 DR. CANONICO: I also notice on
- page 7, your boiler attendant is a trained,
- 19 qualified individual. And the boiler attendant
- 20 may be classified as one of the following: Boiler
- 21 attendant, slash, security guard. I have
- 22 trouble -- I've always had trouble with this idea
- 23 that you could have a boiler attendant and the
- security guard who is expected to handle problems
- in the plant, fights, people breaking in, and yet

- 1 be available as a boiler attendant. I've always
- 2 had problems with that. Not just with you, with
- others.
- 4 MR. BENSON: I think sometimes
- 5 where we get -- and Ernie and I talked about this
- on the way here today -- is to remember that we've
- 7 got the person -- the personnel that are at the
- 8 PBX that we don't even qualify as an attendant are
- 9 trained to shut that down when they hear an alarm.
- 10 Just as they're trained to grab a fire
- 11 extinguisher if they see a fire. That's an
- 12 emergency response.
- So we're not dependent upon that
- security personnel to be in the vicinity of that
- 15 shutdown in the event of an alarm. Those folks
- that are 24/7 in that vicinity are the folks that
- 17 know to hit that e-stop button when they hear that
- 18 alarm. So there's no delay in their waiting for
- 19 someone to respond.
- 20 CHAIRMAN MORELOCK: And your boiler
- 21 tech is actually the trained boiler expert --
- MR. BENSON: Right.
- 23 CHAIRMAN MORELOCK: -- that can
- 24 start, stop --
- MR. BENSON: That's the restart.

- 1 CHAIRMAN MORELOCK: -- maintain the
- 2 boiler. Not the attendant.
- 3 MR. BENSON: Right.
- 4 MR. HUDGINS: Now, in the event of
- 5 a false alarm, we're going to get the alarm at the
- 6 PBX, the PBX operator is going to hit the
- 7 emergency stop button. The boiler should shut
- 8 down. They're to call the boiler attendant and he
- 9 has to go immediately and visit. Now, he will
- 10 shut down -- if for some reason the emergency stop
- 11 button did not kill the boiler, he will shut the
- 12 boiler down, but he cannot restart it.
- 13 DR. CANONICO: Again, back at the
- top of page 7, that I was looking at a minute ago,
- 15 "The boiler attendant is a trained, qualified
- individual who is designated to monitor the
- 17 boilers. The boiler attendant may be classified
- 18 by Morristown-Hamblen Healthcare Systems as one of
- 19 the following:"
- 20 And that's where you have it as a
- 21 boiler attendant, slash, security quard. And then
- in the next paragraph, if you will, "The boiler
- 23 technician is a trained, qualified "-- et cetera.
- The boiler tech may be classified by Morristown-
- 25 Hamblen Healthcare System as one of the

- following:"
- 2 MR. HUDGINS: The three people
- 3 listed there at this specific hospital have
- 4 training and experience to operate the boiler.
- 5 They can start and stop it. The team leader --
- 6 MR. BENSON: Senior tech and a
- 7 general tech.
- MR. HUDGINS: Yeah. All are 20,
- 9 30-year --
- MR. BENSON: Oh, yeah. They do
- 11 that. And, again, get training above and beyond
- 12 what's in this manual.
- 13 DR. CANONICO: One is a boiler
- 14 attendant and the other is a boiler technician.
- 15 MR. HUDGINS: The boiler attendant
- can be a lightbulb changer, you know, security
- 17 personnel. All they can do -- all they know to do
- is to go into the boiler room and look at the
- marks on the gauges and see if they're in the
- 20 normal operating, record it. Like I say, they are
- 21 not to --
- DR. CANONICO: Do they get the
- 23 16 hours of training?
- MR. HUDGINS: What, now?
- DR. CANONICO: Do they get the

- 1 16 hours of training?
- MR. BENSON: The attendants do have
- 3 the 16 hours of training.
- 4 DR. CANONICO: That includes that
- 5 security guard?
- 6 MR. BENSON: That's right.
- 7 MR. HUDGINS: On page 7, they
- 8 receive the 16 hours of training to operate the
- 9 boiler.
- 10 MR. ROBINSON: I struggle with that
- 11 also.
- MR. HUDGINS: What's that?
- MR. ROBINSON: The terminology.
- MR. HUDGINS: I'm sorry. I
- 15 didn't --
- MR. ROBINSON: I struggle with the
- 17 terminology. You said boiler attendant. You had
- 18 made a listing earlier in the manual where you had
- 19 defined the boiler attendant. And then, out of
- 20 nowhere, you started talking about the boiler
- 21 tech.
- MR. HUDGINS: Okay.
- 23 MR. ROBINSON: And I was able to
- find the difference between the two; however, then
- 25 there was an issue with the security guard.

- I think Dr. Canonico's -- to
- 2 Dr. Canonico's point, if you clean up the
- 3 terminology as far as "boiler attendant" as maybe
- 4 a "boiler monitor" or something cleaner than that
- 5 to where we would know that this guy does
- 6 absolutely nothing to the boiler.
- 7 MR. HUDGINS: Okay.
- 8 MR. ROBINSON: And prior to that
- 9 you had also made another statement where you had
- said that maintenance is performed by the boiler
- 11 attendant.
- MR. HUDGINS: If I do, I apologize
- 13 for that.
- MR. ROBINSON: No. It's okay.
- 15 MR. HUDGINS: I was hoping I had it
- 16 plain that it was only the techs.
- 17 MR. ROBINSON: But then you go back
- 18 and you look and it says -- well, what does he do?
- 19 And then you say no, he doesn't work on a boiler.
- MR. HUDGINS: No, he does not.
- 21 MR. ROBINSON: So if you clean that
- up, I think it will -- to Dr. Canonico's point --
- 23 I'm sorry, I didn't mean to interrupt.
- DR. CANONICO: You also have, under
- 25 boiler attendant, slash, security guard, back

- 1 further in the report, you have provides security
- 2 service such as escorts, lock and unlock of
- 3 buildings, and things of that nature. I have
- 4 trouble with that person being a boiler attendant
- 5 and doing all these other -- having all these
- 6 other responsibilities.
- 7 I mean, this isn't novel to you.
- 8 Don't misunderstand me.
- 9 MR. HUDGINS: I understand.
- DR. CANONICO: But it's something
- 11 that's a burr under my saddle, among other places.
- 12 MR. BENSON: Would we have the
- liberty to come get a title, like -- I'm going to
- 14 throw something -- emergency responder or whatever
- under that, or alarm response?
- 16 CHAIRMAN MORELOCK: Well, I guess
- my question is what is the difference between the
- 18 dispatchers who are remote monitors and the boiler
- 19 attendant? Because the boiler tech is pretty well
- 20 defined. I'm like you. I started confusing the
- 21 terms until I got them clarified.
- 22 But what is the difference -- because
- you've got the PBX man by emergency dispatchers,
- and they're the ones that hit the e-stop as well,
- 25 so -- but then you also say that the boiler

- 1 attendant does nothing but monitor the boiler and
- 2 hit the e-stop in the case of emergency. Then the
- 3 boiler tech is the one who actually operates,
- 4 maintains, and tests the boiler and all of that
- 5 stuff. So I think that's what's leading to our
- 6 conversation, is what are the main differences
- 7 between the dispatchers that are doing the remote
- 8 monitoring and the boiler attendant? It looks
- 9 like they're almost doing the same thing.
- DR. CANONICO: See, you have
- another one here, boiler attendant/security guard.
- 12 And the security guard apparently carries a loaded
- firearm, fights fires at inception stage, and may
- 14 have physical contact during crisis intervention.
- 15 I find it hard to believe if that person is
- undergoing all that stress that the boiler is also
- 17 key or top on his mind.
- MR. BENSON: We're trying to
- 19 maximize the number of people in that facility
- 20 outside of -- that PBX operator cannot leave their
- location, where they are. So we're trying to
- 22 maximize the number of people, 24/7, that can move
- to that boiler room upon alarm and see what's
- 24 going on. So those security guys, we need them
- included for that along with those boiler

- 1 attendants. And maybe there's two boiler
- 2 attendants on duty and they're tied up with a
- 3 flood on the third floor or something when that
- 4 alarm hits, and that security guy that's nearby
- 5 can get there.
- 6 So that's what -- we're trying to
- 7 build a bigger force of responders for those
- 8 alarms.
- 9 CHAIRMAN MORELOCK: Okay.
- MR. BENSON: But we do need to
- 11 clarify that. I'll give you that.
- 12 CHAIRMAN MORELOCK: Okay. Any
- 13 other comments?
- 14 MR. BAUGHMAN: Yes. Who's been
- 15 attending the boiler so far? Who's the one that's
- 16 been going back and looking at it under --
- 17 DR. CANONICO: The 20-minute rule?
- MR. BAUGHMAN: Yes.
- MR. BENSON: Those are our
- 20 attendants and techs that are doing that.
- 21 MR. BAUGHMAN: Okay. And it's --
- the reason for going in with this variance, I'm
- 23 still interested in past history. I don't know
- if -- I don't know what can be brought to the
- table in that respect. I don't want to beat it to

- death. How many boiler techs have we got? I
- 2 mean, just offhand, how many would know being at
- 3 the facility?
- 4 MR. HUDGINS: I think there's three
- 5 techs.
- 6 MR. BENSON: Three techs and maybe
- 7 four or five attendants.
- 8 MR. BAUGHMAN: Okay. So we've got
- 9 three techs and we're operating 24 hours a day.
- 10 So we've got one per shift?
- MR. BENSON: Yes.
- 12 MR. BAUGHMAN: I take it they take
- vacations at some point in time. I'm looking at
- 14 the manpower. The logistics of the manpower shows
- me that if somebody becomes ill or is out, we're
- going to be short a tech to be able to respond to
- 17 a reset. Because the attendant can't reset the
- 18 boiler. It states that clearly in your manual.
- 19 Boiler attendants are not permitted to restart the
- 20 boiler. I'm just wondering, if we're short on
- 21 personnel, if that won't actually happen.
- MR. BENSON: In all of our
- 23 facilities, we run an on-call schedule for these
- 24 guys. So if there's the absence of someone that
- 25 can restart a boiler, then there is someone that

- can restart a boiler that's on call that's got to
- 2 respond back to the hospital.
- 3 MR. BAUGHMAN: Which may not be a
- 4 boiler tech.
- 5 MR. HUDGINS: No. It would be a
- 6 boiler tech.
- 7 MR. BAUGHMAN: Okay. Because what
- 8 I'm thinking of is I've got a very limited number
- 9 of personnel, so, playing devil's advocate, it
- 10 appears to me just with the personnel that are
- listed that that's a possibility that it could
- 12 happen.
- 13 MR. BENSON: That team leader is
- 14 responsible for the scheduling of those personnel,
- and that's part of his scheduling that he's got to
- do throughout the year. Because when these guys
- 17 request vacation time or they call in sick, he's
- got to adjust so that he's got that covered.
- 19 Another individual that we've got like that, be it
- 20 somebody, you know, that -- usually it's the same
- 21 kind of guys that are specialized in plumbing.
- He's going to want to make sure he's got one of
- those guys that's available, too, if somebody is
- on vacation or out that day.
- MR. HUDGINS: And, you know, they

- 1 understand that if they have an upset condition
- 2 that somebody may have to come in on call and they
- 3 would be without a boiler until -- I think Robert
- 4 said he's, like, 20 minutes away and another guy
- 5 was --
- MR. BENSON: If that.
- 7 MR. BAUGHMAN: But if we do by
- 8 chance have to then operate under the 20-minute
- 9 rule if there's personnel to go out and what have
- 10 you, those personnel could be boiler attendants
- 11 like security guards.
- 12 MR. HUDGINS: Under the 20-minute
- 13 rule, that's correct.
- MR. BAUGHMAN: Okay.
- DR. CANONICO: And, also, under
- 16 your senior facility services technician, there's
- 17 no mention of boilers. The same is true for your
- 18 senior facility services.
- MR. BENSON: Is this in the job
- 20 description?
- DR. CANONICO: I thought I read
- 22 earlier where they were also part of your boiler
- people.
- MR. HUDGINS: At Morristown-
- 25 Hamblen, yes.

- DR. CANONICO: There's not a page
- 2 number I can give you. I'm sorry.
- 3 CHAIRMAN MORELOCK: It's in
- 4 Appendix G.
- DR. CANONICO: Yeah, Appendix G.
- 6 MR. HUDGINS: Yeah.
- 7 CHAIRMAN MORELOCK: Any other
- 8 comments?
- 9 MR. ROBINSON: Yes. What exactly
- is a PBX? What is that abbreviation?
- MR. BENSON: It actually stands for
- 12 private branch exchange. And originally that term
- was used for the phone system that tied in in a
- hospital or in an office building where that is.
- 15 What it's coming to be known as is the central
- 16 communications and alarm areas in a building like
- 17 a hospital. It's incorrectly used but it's the
- 18 term that everyone knows that's in the hospital
- 19 business. The PBX is the communication center.
- 20 MR. ROBINSON: If you would be kind
- 21 enough, you've got the abbreviation acronym. Give
- me something so I'll know. I saw "PBX" and I'm
- 23 thinking a lot of different things.
- MR. BENSON: I think we need to do
- 25 a definition section at the very beginning --

- 1 MR. ROBINSON: Well, just put it in
- 2 the front. That way it will be -- and you just do
- 3 it one time. You don't have to do it all over the
- 4 book. That way we'll know. And then also -- and
- 5 I think I started on page 2, the first paragraph,
- 6 Bullet 3.
- 7 MR. HUDGINS: Yes, sir.
- 8 MR. ROBINSON: Have you had any
- 9 past failures/problems with the boilers?
- MR. BENSON: Well, we have alarms
- 11 and --
- 12 MR. ROBINSON: I mean past problems
- 13 that required repair.
- MR. BENSON: I'm sure that we have,
- but I can't -- I don't recall them right offhand
- 16 with this particular location.
- 17 MR. ROBINSON: How long have you
- 18 been there? I'm just curious.
- MR. BENSON: We've had this
- 20 hospital for two -- between two and three years.
- MR. HUDGINS: It's been three
- 22 years. Under the covenant branch, this is, like,
- what, number four or five?
- MR. BENSON: Are you asking for
- 25 variances or ...

variety of alarm codes preset by certain

normally what we see at the Board, we see a

24

25

- 1 manufacturers.
- MR. BENSON: Correct.
- 3 MR. ROBINSON: And the thing is is
- 4 the codes are so laborious to go through and
- 5 identify each one to a pertinent fault, that
- 6 sometimes just throwing it into the book makes it
- 7 look good.
- Now, just be aware that if this
- 9 variance is approved, then those alarms, the
- 10 pertinent ones are going to be verified. So know
- 11 for clarity that those variances -- I'm sorry --
- 12 that those codes are actual faults that would
- determine pass/fail.
- MR. HUDGINS: Okay.
- 15 MR. ROBINSON: As I was looking
- through your location on your appendix for your
- 17 boiler description, the 2013 Superior boiler was
- okay, meaning it's clear and it had been
- inspected. But the 1982 boiler -- well, let me
- 20 get this right -- the numbers were wrong on the
- 21 Tennessee serial numbers.
- So my advice is to make a correction
- 23 prior to being audited. And it's the second
- 24 boiler. One is named a Cyclotherm on one piece of
- 25 paper I had, and then on the other it was called

- 1 an Osweeo.
- MR. HUDGINS: The boiler?
- 3 MR. ROBINSON: Yes. So maybe -- I
- 4 don't know if I just -- maybe I miscued a key.
- 5 But my thinking is that I didn't. So make sure
- 6 that that's correct. Also --
- 7 MR. HUDGINS: Are you saying that
- 8 on the Appendix A-1 --
- 9 MR. ROBINSON: Let me get the
- 10 drawing.
- MR. HUDGINS: Like, Boiler 2 --
- MR. ROBINSON: Yes.
- MR. HUDGINS: -- is it the --
- MR. ROBINSON: T92 -- and in fact,
- 15 if you look -- just use good logic. Tennessee
- 16 serial numbers are in succession. If you look at
- Boiler Number 2, it's T92639, but it was built in
- 18 1982. That's impossible.
- MR. HUDGINS: Okay.
- MR. ROBINSON: Okay? It's wrong.
- 21 So just --
- MR. HUDGINS: If there had been a
- 23 repair done on the boiler, would it have gotten a
- 24 new T number?
- MR. ROBINSON: No, sir. If you

- 1 think that that's the correct number, my advice is
- 2 to contact the chief and let him know that you've
- 3 got a conflict. Okay? But I know that this is
- 4 not right.
- 5 MR. HUDGINS: Okay. We'll go back
- 6 and lay eyes on it again.
- 7 MR. ROBINSON: Okay. And in your
- 8 site drawing Number 2, you show the location of
- 9 the control room and it's showing as BX -- BSP.
- 10 Is that correct?
- MR. HUDGINS: What page?
- 12 MR. ROBINSON: SD-2 -- SD.2.
- 13 CHAIRMAN MORELOCK: Where the PBX
- is, it shows it as a BSP instead of a PBX -- I had
- 15 that, too -- at the nurses station.
- MR. HUDGINS: Yes, sir. The BSP is
- the boiler shutdown panel.
- 18 CHAIRMAN MORELOCK: Okay.
- MR. ROBINSON: Got it. Okay. So
- 20 that is the BSP.
- MR. HUDGINS: That's where the
- 22 boiler shutdown panel is located.
- MR. ROBINSON: So you threw another
- 24 term at us.
- MR. HUDGINS: Okay.

- 1 CHAIRMAN MORELOCK: Well, your
- 2 manual says PBX, so could just maybe put location
- of PBX or something so that people will know
- 4 that's what you mean.
- 5 MR. BENSON: All right. I think we
- 6 might want to gravitate away from PBX and go with
- 7 boiler shutdown panel.
- 8 MR. ROBINSON: It's okay.
- 9 MR. BENSON: All right.
- 10 MR. ROBINSON: I thought it was
- 11 correct, but the thing is, it's just that I want
- 12 to make it apples to apples.
- MR. BENSON: Okay.
- MR. ROBINSON: So if I'm reading
- 15 this, I'm going to follow it. And that's okay.
- 16 What kind of daily testing is
- performed on the boiler and by whom?
- 18 MR. BENSON: Now, there's a -- as
- 19 far as this is concerned, we identify what happens
- 20 each day at the beginning of each shift. As far
- 21 as testing on the boilers, the boiler technicians
- are the folks that are doing the regular boiler
- 23 maintenance. And I'm not a boiler professional.
- 24 So they're going in and they have routine
- 25 preventative maintenance, blow-downs that they do.

- 1 They're checking their chemistry. And I know that
- that's taking place. They're also responsible for
- 3 making sure when it's time to open the boilers for
- 4 internal inspection. They've got all that
- 5 repaired also.
- 6 MR. ROBINSON: Is that included on
- 7 the logbook?
- MR. BENSON: That should all be on
- 9 the logbook.
- MR. ROBINSON: So --
- MR. BENSON: The chemistry may not.
- 12 MR. ROBINSON: Okay. But the test
- is. Is that incorporated in this manual, that
- 14 log?
- 15 MR. HUDGINS: There's a log sheet
- to verify that someone has been in there every
- four hours and recorded, you know, the pressures
- and water levels on the site gauges.
- MR. BENSON: Are you looking for
- the standing 20-minute log?
- 21 MR. ROBINSON: Is this the
- 22 (indicating) --
- MR. HUDGINS: There you go, yes.
- MR. ROBINSON: This is the one?
- 25 MR. HUDGINS: That's the one.

1 MR. ROBINSON: Okay. If you will 2 be so kind as to revise that. Now, here is what you say, just going through it. Boiler on/boiler 3 off. Water level in inches above/below mark. In 4 5 reality, if it's below the site glass -- if the 6 water level was so low that you can't see it --7 MR. HUDGINS: We've got a problem. 8 MR. ROBINSON: -- you've got 9 issues. 10 MR. BAUGHMAN: Or if the site glass is plugged up. 11 12 MR. ROBINSON: You've got issues. So my point being, is so you check off one, you 13 14 check off two, and then you check off the DA Tank, 15 and it's really -- it doesn't mean anything. So I 16 would prefer seeing a daily test of something, at 17 least with the water blow-down perhaps, and make 18 it an item that you can visually touch, meaning I can visually look at it, say yes, he did an 19 examination on the blow-down, as opposed to --20 21 because this is not -- this does nothing. 22 MR. HUDGINS: Okay. It just 23 verifies that he's been there and --24 MR. ROBINSON: Yes, sir. That's

all. It does nothing for the safety of the

25

- 1 boiler. So revise that.
- MR. HUDGINS: So if we added, like,
- another checklist, boiler on/boiler off, site
- 4 glass blow-down.
- 5 MR. ROBINSON: Or just put in
- 6 another column and --
- 7 MR. HUDGINS: Yeah, that's what I
- 8 mean.
- 9 MR. ROBINSON: Yeah. Just put
- 10 it --
- 11 MR. HUDGINS: If the boiler is off,
- 12 he doesn't need to blow down the site glass. If
- the boiler is on, he needs to.
- MR. ROBINSON: That's all I had.
- 15 CHAIRMAN MORELOCK: Any other
- 16 comments?
- 17 MR. BAUGHMAN: Yes, sir. Under
- 18 Appendix H, Boiler Variance Training Log, in the
- 19 back -- it's listed as H-1 -- you say that
- 20 everybody has been trained. And I know this is a
- 21 training log, but it's blank. And I'm wondering
- 22 if we already have a training log filled out. But
- we're granting a variance on a -- or proposing to
- grant a variance where we don't have anybody
- 25 trained yet; is that correct?

- 1 MR. BENSON: Can I speak?
- 2 MR. HUDGINS: Yes.
- 3 MR. BENSON: When we did this in
- 4 the past at Roane Hospital, for example, we
- 5 provided that to the inspector when they came on
- 6 the site. It was a list of everyone that had been
- 7 trained, the training manual, and then we visited
- 8 each of the locations on the site map, and he
- 9 tested those folks on their knowledge. And if
- 10 they had been trained, their name was included in
- 11 the training sheet.
- 12 MR. BAUGHMAN: Very good. So this
- has been -- this has been -- we've had a variance
- in place before, so I take it we've already had an
- inspector involved with being out there from a
- variance standpoint; is that correct?
- 17 CHAIRMAN MORELOCK: At least
- initially, yes.
- MR. BAUGHMAN: And that would be
- 20 Mr. Jackson?
- 21 MR. JACKSON: Not at that time.
- 22 MR. BAUGHMAN: Not at that time?
- Okay.
- MR. ROBINSON: We just implemented
- 25 the three-year renewal program.

- 1 proposition. We've talked about it before. It's
- 2 not that it's a requirement of our variance at
- 3 this particular point in time. But does it have a
- 4 current certificate of inspection on it?
- 5 MR. HUDGINS: It does.
- 6 MR. BAUGHMAN: All right.
- 7 MR. HUDGINS: Would you like for me
- 8 to include that under -- on that data sheet for
- 9 the --
- 10 MR. BAUGHMAN: I would like the
- 11 data sheet for it. And especially since it is an
- integral part of the system and it is a pressure
- vessel, I'm taking it it's a true DA and not an
- 14 atmospheric unit.
- MR. HUDGINS: It is.
- MR. BAUGHMAN: I would like to have
- 17 it included in that.
- MR. HUDGINS: Okay.
- MR. BAUGHMAN: So, yeah ...
- MR. HUDGINS: So I guess under
- 21 Appendix 1 where we have the serial number, model
- 22 number, and the T number, just include a --
- MR. BAUGHMAN: Yeah, the data
- 24 information on that.
- 25 MR. HUDGINS: -- data information

revision to the existing one, isn't it?

23

24

25

CHAIRMAN MORELOCK: If you're

MR. JACKSON: Well, that's just a

- 1 using -- yes, it would be -- if the previous
- 2 boiler had a variance on it, then it would be more
- 3 correct to say it's a renewal. So do you want to
- 4 make that a renewal or a new installation?
- 5 MR. JACKSON: Deborah printed me
- 6 out a list of all the variances that have been
- 7 issued in the state of Tennessee. This hospital
- 8 is on that list, but, as you know, it shows that
- 9 it's due for renewal.
- 10 CHAIRMAN MORELOCK: Right.
- 11 MR. JACKSON: So it's
- identifying -- the program is identifying that
- there's a variance for this location.
- 14 CHAIRMAN MORELOCK: And that would
- 15 clarify if you --
- MR. JACKSON: I don't have a copy
- of it, but I mean ...
- MS. RHONE: I may have a copy.
- 19 CHAIRMAN MORELOCK: So I'll defer
- 20 to you-all. I mean, you can do as you wish. You
- 21 can renew it. You can say it's new.
- MR. BENSON: I don't know that
- there's an advantage either way. We're going to
- do all this no matter what we call that. So let's
- just say it's a new variance.

- list, as compared to your organizational chart,
- 2 the names aren't spelled the same on both lists,
- 3 so you'll want to just check those.
- 4 MR. HUDGINS: Okay.
- 5 CHAIRMAN MORELOCK: Appendix H is
- 6 not just an appendices for Boiler Variance
- 7 Training Log. It also includes the Boiler
- 8 Variance Manual Log as well. So you'll want to
- 9 correct that.
- 10 MR. HUDGINS: As far as who holds
- 11 the variance?
- 12 CHAIRMAN MORELOCK: Well, just as
- far as the section titles and all. So when you're
- 14 looking at the Table of Contents, you may not find
- 15 the manual log because it doesn't say that it is.
- 16 And I can't find the facilities
- 17 manager on the organizational chart, so you'll
- 18 want to add that.
- 19 And make sure that the job titles on
- 20 the organizational chart and the text are
- 21 consistent, because we don't know your
- organizational structure. So we get in the manual
- and we see the same person with two different
- titles, potentially, we don't know -- it's
- confusing, a little bit. So just for clarity for

- 1 somebody that's outside your organization, it
- 2 would help. And that's all I have.
- Any other comments or questions?
- 4 MS. JEFFERSON: Well, there is
- 5 quite a bit of information that you-all provided,
- 6 and just to let you-all know, that's why we have
- 7 our court reporter here. The information will be
- 8 on the website in about two to three weeks. After
- 9 we receive it from the reporter, we will place it
- on the website. That way you can see exactly what
- 11 the board members' comments were.
- 12 CHAIRMAN MORELOCK: And that will
- 13 benefit not only you but also the deputy inspector
- 14 that makes your acceptance inspection, too. So
- 15 that will benefit both of you.
- MR. HUDGINS: And then what we
- 17 started doing, too, is including, like, a revision
- 18 sheet, so any revisions that we make -- like, I've
- 19 got this called out as Rev. 0, so the revisions
- that you've all asked, I'll make it, like, a
- 21 Rev. 1. And then when we make the changes in the
- 22 manual, it will be, like, a different font size or
- 23 a different -- or italics so when the inspector
- 24 comes out --
- 25 CHAIRMAN MORELOCK: Well, we're

- 1 have a new variance.
- MR. HUDGINS: Okay. Thank you very
- 3 much.
- 4 MR. BENSON: Thank you.
- 5 CHAIRMAN MORELOCK: Thank you for
- 6 your presentation.
- We're going to take a 10-minute
- 8 break. I've got 11:00. Be back at 11:10 and
- 9 we'll finish our agenda.
- 10 (Recess observed.)
- 11 CHAIRMAN MORELOCK: Our next
- 12 business item is Item 14-11. James Neville will
- present a variance request to operate three
- 14 high-pressure boilers under the requirements of
- 15 0800-03-03-.04. These boilers are located at
- 16 Vi-Jon Corporation in Smyrna, Tennessee.
- So, gentlemen, first of all, are
- 18 there any conflicts of interest?
- MR. BAUGHMAN: I want to declare a
- 20 conflict of interest.
- 21 CHAIRMAN MORELOCK: Okay. So
- 22 Mr. Baughman does have a conflict of interest on
- 23 this item. Any others? Okay.
- 24 Gentlemen, if you will introduce
- 25 yourselves and then present your item.

- 1 MR. NEVILLE: I am James Neville
- 2 with Neville Engineering.
- 3 MR. BERKEBILE: Steve Berkebile,
- 4 Director Asset Care of Vi-Jon.
- 5 MR. COTHERN: Clay Cothern,
- 6 Facilities Maintenance Manager, Vi-Jon.
- 7 MR. NEVILLE: We are here today to
- 8 present a new variance for Vi-Jon. Vi-Jon is a
- 9 manufacturer of health and beauty care products in
- 10 Smyrna, Tennessee.
- 11 Currently, they're operating three
- power boilers on demand 24/7, 7 days a week. The
- boilers are used for heat and process. In the
- site plan on Figure 1, the resolution was a little
- 15 poor on this and I will update it to -- I guess
- when it was cut and pasted into the document it
- 17 lost some resolution. But there are two boiler
- 18 rooms at this location. One is approximately
- 19 700 feet away from the remote station, and the
- other one in 941 feet away from the remote
- 21 station.
- The remote station will be manned by
- 23 the -- at the -- the main post security guard will
- 24 be the personnel at the remote station. They will
- 25 respond to the boiler alarms with a control panel

- 1 for each of the boilers with a remote shutdown.
- 2 That is a hardwired control panel at the boilers.
- 3 The boiler attendants are listed as
- 4 three different individuals: The facility
- 5 maintenance foreman, the maintenance mechanic
- 6 Level 1, and the maintenance -- or the mechanic
- 7 Level 3.
- 8 Now, I would like Steve to tell you
- 9 about the training of those boiler attendants, as
- 10 far as how they qualify them at Vi-Jon.
- MR. BERKEBILE: And just to get
- 12 ahead of it, to start with, there are seven
- individuals that fill those different roles. They
- 14 are maintenance foreman, mechanic Level 1 and
- 15 mechanic Level 3. All seven of those are trained.
- 16 Initial training was done by the company that
- installed the boilers, and that was a classroom
- theoretical training, a book training, and then
- 19 followed on by practical training at the boilers
- 20 with both walk-through and then demonstrate the
- 21 ability to walk through and perform the
- 22 operations. And that was observed by the
- 23 management team and marked off as -- checked off
- 24 and is documented.
- 25 There's an example of a training

- 1 sheet in here. It is not filled out. I do have a
- filled-out example here with us if you wish to see
- 3 it, and it will be on file and available for
- 4 inspection any time. For our ongoing, continuing
- 5 program, we do have a continuing classroom
- 6 training that goes with this for any new employee,
- 7 and then also we have the annual refresher
- 8 training for our employees.
- 9 MR. NEVILLE: As far as the control
- 10 systems that are on these boilers, the Hawk 4000
- 11 control system has been installed on each of these
- 12 boilers. In Appendix A, we list the three
- boilers. They're identified as Boiler 1 and
- 14 Boiler 2. And Boiler 1 and 2 are in a boiler
- 15 room. And then Boiler 4 is the additional boiler
- in its own separate boiler room.
- 17 Are there any questions from the
- 18 Board?
- 19 CHAIRMAN MORELOCK: Do I have a
- 20 motion?
- 21 MR. ROBINSON: Motion to consider,
- 22 yes.
- 23 CHAIRMAN MORELOCK: So I have a
- 24 motion to approve the variance contingent on the
- acceptance inspection by the deputy inspector. Do

- 1 I have a second?
- DR. CANONICO: Oh, I guess I'm it.
- 3 The only thing that bothers me, you know, if you,
- 4 according to Robert's rules of order, if you've
- 5 seconded something, you can't vote against it.
- 6 CHAIRMAN MORELOCK: Well, see,
- 7 we've cleverly fixed that for you today.
- DR. CANONICO: You're lucky.
- 9 CHAIRMAN MORELOCK: All right. Now
- 10 I'm opening the floor for discussion.
- MR. BAUGHMAN: James, we've got
- 12 Boiler Number 1, Boiler Number 2, Boiler Number 4.
- MR. NEVILLE: Correct.
- MR. BERKEBILE: We just stayed with
- 15 the old designations from their locations in the
- 16 past. We had -- we originally had three in that
- 17 room where there are now two. And the old one was
- 18 always designated before. We did not change the
- 19 designation, for purposes of familiarity and
- 20 understanding location.
- 21 MR. BAUGHMAN: Who put the boiler
- data sheet, Appendix A, information together?
- MR. NEVILLE: I did.
- MR. BAUGHMAN: Then I would ask you
- 25 under Boiler Number 4, the Cleaver Brooks

- 1 FLX700-400-150, you've got it designated as what
- 2 type of boiler at the bottom?
- MR. NEVILLE: That is incorrect.
- 4 It's -- yeah, fire tube.
- 5 MR. BAUGHMAN: And it should be
- 6 what?
- 7 MR. NEVILLE: Water tube.
- 8 MR. BAUGHMAN: Correct. Now, under
- 9 "input," you show an input of what on that boiler?
- 10 MR. NEVILLE: 4,000.
- MR. BAUGHMAN: And what do you show
- 12 as the output?
- MR. NEVILLE: 13,800.
- MR. BAUGHMAN: That's a very
- 15 efficient boiler.
- MR. NEVILLE: That will need to be
- 17 updated.
- 18 MR. BERKEBILE: That's an incorrect
- 19 table.
- 20 MR. BAUGHMAN: Well, and I quess
- 21 what I get at is attention to detail.
- MR. NEVILLE: Sure.
- 23 MR. BAUGHMAN: And if attention to
- detail is not given in this, how much detail is
- given in the rest? And that's kind of the point

- 1 that I get at.
- 2 MR. NEVILLE: Sure.
- 3 MR. BAUGHMAN: You know, we're
- 4 dealing with a piece of equipment that there again
- 5 can relocate the facility, and you want to make
- 6 sure that all the data is there properly.
- 7 Now go under the deaerator data
- 8 sheet. We've got an MB number, but what do we
- 9 have for a Tennessee number?
- 10 MR. NEVILLE: That will need to be
- 11 updated as well.
- MR. BAUGHMAN: I would agree.
- MR. NEVILLE: It's left blank as
- 14 well.
- MR. BAUGHMAN: Does it have a
- 16 Tennessee number?
- 17 MR. COTHERN: It wasn't assigned
- one, and we're working with the boiler inspector
- 19 now to correct that issue.
- 20 MR. BAUGHMAN: It does not have one
- 21 presently?
- 22 MR. COTHERN: It's not -- there was
- an understanding that the old DA number would
- 24 carry over. The tag has not been actually put on
- it, so we're working with --

- 1 that. You're going to update the site plan so
- 2 it's readable.
- 3 MR. BERKEBILE: Yes.
- 4 CHAIRMAN MORELOCK: Nitpicky, but
- on E-2 there's a typo on "Economizer," so that
- 6 needs to be corrected. And, again, the Tennessee
- 7 number for the deaerator, that carries
- 8 ramifications. You don't want to be operating a
- 9 vessel without a valid certificate of inspection
- 10 as well as a Tennessee number on it.
- 11 On page 3 it says that the remote
- monitoring is in the manufacturing supervisor
- office, but then page 5 says that the remote
- 14 monitoring is done at the main post security
- 15 guard, so ...
- MR. BERKEBILE: That's incorrect.
- 17 MR. NEVILLE: Right. It will be in
- 18 the ...
- MR. BERKEBILE: It is in the
- 20 security office.
- 21 CHAIRMAN MORELOCK: Okay. I just
- 22 wanted to clarify that. And in Appendix G, as far
- as the job requirements, I don't see any specific
- job knowledge experience, et cetera, for boiler
- 25 attendants. It just mentions that they'll

- 1 respond, but it doesn't really --
- MR. BERKEBILE: No. The only place
- 3 it talks about what -- who is going to do it is in
- 4 the job description. It just says that they have
- 5 to be --
- 6 CHAIRMAN MORELOCK: Right.
- 7 MR. BERKEBILE: Right. And if you
- 8 would like that added to here as, "These are the
- 9 boiler attendants' knowledge level on skill
- 10 requirements," we can put that in there.
- 11 CHAIRMAN MORELOCK: It's kind of
- 12 like Dr. Canonico's ongoing concern of --
- MR. BERKEBILE: I got that. That's
- 14 good. More detail keeps it up.
- 15 CHAIRMAN MORELOCK: -- making sure
- that they understand the importance of the
- 17 equipment that they're monitoring.
- 18 MR. BERKEBILE: We'll add that to
- 19 the manual.
- 20 CHAIRMAN MORELOCK: Okay. That's
- 21 all the comments I have.
- MR. BERKEBILE: Knowledge and
- 23 skills.
- MR. BAUGHMAN: For Boiler Number 4,
- what type of feedwater system have we got? I take

```
Page 94
1
      it it's atmospheric instead of the DA?
 2
                     MR. COTHERN: Correct.
 3
                     MR. BAUGHMAN: Okay. I just didn't
 4
      see it listed as a DA so I just thought I'd bring
      it out.
5
 6
                     CHAIRMAN MORELOCK: Any other
      comments?
8
                   (No verbal response.)
 9
                     CHAIRMAN MORELOCK: Okay. I'm
10
      going to call the question. All in favor say,
      "Aye."
11
12
                   (Affirmative response.)
13
                     CHAIRMAN MORELOCK: Opposed?
14
                   (No verbal response.)
15
                     CHAIRMAN MORELOCK: Abstentions?
16
                     MR. BAUGHMAN: (Indicating.)
                     CHAIRMAN MORELOCK: One abstention.
17
18
      Nonvoting?
19
                   (No verbal response.)
20
                     CHAIRMAN MORELOCK: Okay. Item
21
      carries.
22
                     DR. CANONICO: Is that an
23
      abstention or a nonvote?
24
                     CHAIRMAN MORELOCK: Abstention.
25
                     MR. BERKEBILE: Thank you very much
```

- 1 for your time. Appreciate it.
- 2 CHAIRMAN MORELOCK: Thank you,
- 3 gentlemen. That concludes all of our new
- 4 business. Our next agenda item is open discussion
- 5 items. And our first item is reorganization of
- 6 Rule 0800-03-03.
- 7 And I want to begin this discussion
- 8 thanking Sydne for all of her hard work to chase
- 9 all the references down and assemble this into
- 10 something that looks really good.
- 11 We can read and we can actually begin
- to move forward with this, so thank you for all of
- 13 your hard work.
- MS. EWELL: You're welcome.
- 15 CHAIRMAN MORELOCK: One of the
- things that we agreed to just recently is that
- 17 this discussion item -- which is not a voted
- 18 action today -- but this discussion item was for
- the reorganization of Rule 0800-03-03 to make it
- 20 easier to use, make it more user friendly. And we
- 21 feel like we've pretty much completed that aspect
- 22 of it.
- Some of the board members had some
- 24 comments concerning making some revisions to the
- 25 rule. And Sydne said that since we're in the

- 1 rule-making process, that would be acceptable. So
- what we're going to do for the next few minutes is
- 3 I have a list of comments from the board members.
- 4 Sydne and I have worked to put those comments into
- 5 the draft, and we're basically going to discuss
- 6 those comments and hope to have this item in good
- 7 enough order to possibly vote in December. But
- 8 we'll see what the discussion leads to today.
- 9 There are a few color copies up here
- on the table if you would like one. But we're
- just going to go through these comments.
- MS. JEFFERSON: Can we ask Deborah
- and Neil to come up a little closer?
- 14 CHAIRMAN MORELOCK: Sure.
- 15 MR. BAUGHMAN: If any of you want
- 16 any of those copies ...
- MR. ENG: I'll come up.
- 18 CHAIRMAN MORELOCK: And,
- 19 Mr. Jackson and Ms. Rhone, your presence has been
- 20 requested up here so you can participate in the
- 21 conversation.
- 22 And before you run off with all of
- that, there's a sheet of comments right here
- 24 beside it. You'll need both.
- MR. ENG: Oh, okay.

```
1
                     CHAIRMAN MORELOCK: We're going to
      start with the little, short, small handout that's
 2
 3
      got the comments on it, so if you don't have one
      of those, we'll -- I think everybody's got it.
 4
 5
                   We'll begin with Dr. Canonico's
 6
      comments. And the first comment is Item 1.
      will take us to page 3, Item 11(a).
 8
      Dr. Canonico's comment was asking a question,
      "What is meant by 'reasonable'" under (a)?
9
10
                   And the way it reads under (a) is,
      "'Internal inspection' means an inspection that
11
      can reasonably be conducted on the internal and
12
      external surfaces of a boiler or pressure vessel
13
14
      while it is shut down and the manhole plates,
15
      handhole plates or other inspection opening
16
      closures are removed."
                   So Dr. Canonico's comment and
17
18
      question is there. He asked what is meant by
      "reasonable."
19
20
                   What is reasonable to you may not be
21
      to me. And so the Boiler Unit response to this
22
      comment was, "No, we do not think the word
23
      'reasonably' should be deleted. 'Reasonably be
      conducted' should be further clarified 'as
24
25
      assessed by the inspector according to the
```

- inspection or review on the internal and external surfaces of a boiler or pressure vessel ...'"
- 3 So the way (a) would read as
- 4 proposed -- and that's what you're going to see on
- 5 page 4 in the box. And the purple text is what is
- 6 being proposed, starting with item (a). It says,
- 7 "'Internal inspection' means an inspection that
- 8 can reasonably be conducted as assessed by the
- 9 inspector according to the inspection or review on
- 10 the internal and external surfaces of a boiler or
- 11 pressure vessel while it is shut down and the
- 12 manhole plates, handhole plates or other
- inspection opening closures are removed."
- 14 Comments on that? Is that
- 15 acceptable? Unacceptable?
- MR. BAUGHMAN: One of the comments
- 17 I have -- and we've got some inspectors in here --
- is that, especially on low-pressure steam and
- 19 hot-water boilers, there's a lot of them that we
- see in the field from the service standpoint that
- 21 don't get inspected internally, especially with a
- 22 hot-water system, because you have an introduction
- of air into the system when you fill it up. Once
- you drain it down and you fill it back up, you get
- 25 a lot of air in the system. And that can be a

- 1 real pain to get rid of that air at the time of
- filling it back up. And so, therefore, a lot of
- 3 times it doesn't get inspected. It should. It's
- 4 required that it does, but it doesn't.
- 5 A low-pressure steam boiler, a lot of
- 6 times, won't get inspected because it's
- 7 low-pressure steam. And it doesn't necessarily
- 8 have easy access ports to open up. It may have
- 9 plugs in it that are hard to open up or what have
- 10 you. So "reasonably," I think, needs to be
- defined as is it reasonable for the inspector to
- 12 request it to be opened up? Is it reasonable for
- the customer to say, "Hey, it's too hard to open
- 14 up"?
- 15 So, there again, reasonably is kind
- of still a term that I think the inspector needs
- 17 to have a clear definition on.
- 18 CHAIRMAN MORELOCK: Okay. So if we
- add the responsibility to it basically saying "as
- 20 assessed by the inspector, "do you think it needs
- 21 more than that?
- MR. BAUGHMAN: I don't. I just was
- 23 throwing that out there because some of you in the
- audience, too, have field experience and have
- 25 stuff to add to that also in this discussion. But

- I wanted to throw it out there because I know from
- 2 the fact that there are a lot of boilers that
- don't get looked at internally because of either
- 4 the boiler is not easy to open up or there's
- 5 problems, and when it's opened and filled back up
- 6 that it becomes an issue.
- 7 So who determines "reasonably" -- and
- 8 that inspector -- really, I think it falls on the
- 9 inspector's shoulders to say, "Hey, I understand
- 10 these issues but we need to look at the vessel
- internally regardless of those issues."
- 12 CHAIRMAN MORELOCK: Well, now, a
- 13 code term -- ASME and National Board both use the
- 14 term "practicable," which means in practice is it
- 15 possible. And so I don't know if you want to put
- "thermal inspection" means an inspection that is
- 17 practicable or can be done as a practice or just
- 18 leave it reasonable and then add a caveat to it.
- Go ahead, Dr. Canonico.
- DR. CANONICO: I like the change of
- 21 adding the inspector. At least you've got
- somebody making a decision that is responsible.
- 23 And that takes care of my concern of the word
- "reasonable." "Reasonable" is too open ended.
- 25 MR. ROBINSON: So how would it

- 1 read?
- 2 CHAIRMAN MORELOCK: Just like it is
- 3 right here.
- 4 MR. ROBINSON: Good. Okay.
- 5 CHAIRMAN MORELOCK: So any other
- 6 comments on that? If not, we're going to accept
- 7 that and move to the next one. Everybody --
- 8 MR. ROBINSON: I'm just going to
- 9 interject something.
- 10 CHAIRMAN MORELOCK: Go ahead.
- MR. ROBINSON: In addition to that,
- just keep in mind that there are low-pressure
- boilers out there that really have limited access.
- 14 Okay? And an internal inspection is worthless.
- 15 For example, a Lochinvar, you've got a water box
- on one end, a water box on the opposite end, and
- if you open the ends of it, it means absolutely
- 18 nothing. Point being, in certain instances, you
- 19 need the inspector to make the call as to if he
- 20 can actually see on the inside of the pressure
- 21 vessel. That's my comment.
- 22 CHAIRMAN MORELOCK: Well, and by
- adding this, you are putting onus on the inspector
- 24 to say this is reasonable or this is not
- 25 reasonable. And when he fills out whatever forms

- 1 he fills out, whether it be an inspection or
- 2 repair and alteration, he's putting his commission
- 3 number and his signature on that line, so it falls
- 4 back on him with ramifications of if he is not
- 5 doing due diligence, he will lose his commission.
- 6 MR. ROBINSON: Absolutely.
- 7 CHAIRMAN MORELOCK: And there is a
- 8 peer review process and all of that, so I think
- 9 that would satisfy all of that.
- MR. BAUGHMAN: One of the things
- 11 that I find is that there's a need that the
- inspectors have a higher level of training on the
- 13 boilers themselves because there's so many
- variations out there on, let's say, looking at a
- 15 Wright or an Ajax boiler and it be in a water tube
- 16 compared to -- and a steel water tube compared to
- a copper thin-tube type of boiler. And --
- 18 MR. ROBINSON: Or a Miura.
- MR. BAUGHMAN: Yeah. Absolutely.
- 20 So there's so many differentiations of boilers out
- 21 there, and the inspector needs to be more versed
- on the types of boilers that he's looking at to
- 23 know what needs to be looked at and what boilers
- 24 can be opened up reasonably and what can't. And I
- 25 would say that there would be support for that

- 1 higher technical training in however we could
- 2 accomplish that. But I know that that's something
- 3 that needs to have some attendance to.
- 4 MR. JACKSON: Now, we're not
- 5 talking about just state inspectors. We're
- 6 talking about the insurance inspectors, too.
- 7 MR. BAUGHMAN: Absolutely.
- MR. JACKSON: We have no control
- 9 over those people.
- MR. BAUGHMAN: That's true.
- 11 MR. ROBINSON: Normally, the
- insurance guys -- you know, I've seen two
- entities -- they provide some level of assistance
- internally. Right now there's a real massive push
- to improve on mitigation of exposures --
- MR. JACKSON: True.
- 17 MR. ROBINSON: -- in all areas.
- 18 You wouldn't believe right now the rush to reduce
- 19 exposures. And the reason why is because the
- 20 market is becoming more competitive. So it's a
- 21 price war, but at the same time, you don't want to
- see costs associated with that cause. So training
- has been enforced or training has went across the
- 24 board.
- 25 Hartford Steam Boiler, they used to

- 1 have their independent training classes, and they
- 2 encouraged their employees to continue. You know;
- 3 you were an employee of Hartford. I know my
- 4 company is also doing the same thing, and some of
- 5 the other companies.
- 6 And we also have had outside training
- 7 classes. And we have our internal meeting. And,
- 8 you know, one of the venues that we're seeking,
- 9 also, is the fall conference. And this is where
- 10 we develop a lot of face-to-face recognition. We
- develop a lot of ideas as far as what's current in
- the market, and in failures that we're seeing.
- 13 And some -- you could pull somebody to the side
- 14 and say, "Hey, listen. You know, I've seen that
- 15 Vi-Jon blower you had over there." And you get
- the new tell-tale things out, so ...
- 17 Fulton came out years ago. Fulton
- 18 had a design that they were clogging up the feeder
- 19 tube. Hartford traded off a little tech bulletin.
- The tech bulletin came by way of somebody to Dave
- 21 Baughman and it ended up going throughout the
- 22 whole fall conference. So everybody knew what to
- do with a 1969 Fulton. I mean, so it's -- it's
- 24 still developing. It's not perfect.
- 25 CHAIRMAN MORELOCK: So are we good

- 1 with this revision?
- 2 (No verbal response.)
- 3 CHAIRMAN MORELOCK: Hearing no
- 4 opposition, I'm going to call this one as we'll
- 5 incorporate it.
- 6 Next one is on page 10, Item 1, which is
- 7 the top of the page. "Should the request for
- 8 'Permission to Install' come before the Board?
- 9 Who makes decision concerning the fitness for
- 10 service for a vessel that is to be reinstalled in
- 11 Tennessee?"
- 12 And then you can see the text there for
- item (a) is for "Reinstallation of Boilers or
- 14 Pressure Vessels."
- 15 Boiler Unit Response to that comment is,
- 16 "No. Reinstalled permit applications are
- 17 preapproved by the chief inspector or his designee
- 18 with final approval by a deputy boiler inspector
- 19 upon the inspection process. If these permits
- 20 were to go before the Board, it would delay time
- 21 for completion due to regularly scheduled Board of
- 22 Boiler Rules meetings."
- 23 Dr. Canonico's follow-up email states on
- page 11, Item 2, "Permission to reinstall. I
- 25 suggest we add a new (a) as follows:

- 1 'Reinstallation of any boiler or pressure vessel
- 2 must be approved by the Tennessee Board of Boiler
- 3 Rules,' reference letter the remainder."
- 4 Okay. So if you read the proposed text
- 5 under Item 1, which is again as purple, that's
- 6 just the question. So the Boiler Unit's position
- 7 is to leave (a) as is. So any comments on that,
- 8 to leave it as is?
- 9 DR. CANONICO: That's fine with me.
- 10 CHAIRMAN MORELOCK: All right.
- 11 Everybody good with that?
- 12 MR. ROBINSON: It stays the way --
- 13 CHAIRMAN MORELOCK: It's going to
- 14 stay the way it is. So 1(a) will stay as in the
- 15 rules now.
- MR. BAUGHMAN: I was looking at
- 17 1(a), but I was looking at that box and the (a)
- 18 underneath it, which -- can I comment on that?
- 19 CHAIRMAN MORELOCK: Yes.
- MR. BAUGHMAN: Since we're so close
- 21 to it being under that box, "All installers of
- 22 boilers or pressure vessels shall be knowledgeable
- in the proper installation of the boiler or
- 24 pressure vessel they are requesting to install."
- 25 At some point in time, we'll address

- 1 that or see what the support is for taking that
- above the step of what is knowledgeable. Right
- 3 now we have no criteria that determines who can
- 4 install the boiler. It just says they shall be
- 5 knowledgeable. That's a pretty open-ended
- 6 statement.
- 7 MS. JEFFERSON: Sort of like
- 8 reasonable.
- 9 MR. BAUGHMAN: Yeah, sort of like
- "reasonable." Only I think it's even further. If
- 11 you're installing a boiler -- Kim, do you know
- 12 something about boilers? A little bit?
- 13 MS. JEFFERSON: Yes. I've learned
- 14 a lot.
- 15 MR. BAUGHMAN: Okay. Well, I think
- 16 you're knowledgeable to install a boiler.
- 17 That's where we sit at with it, and I
- 18 think that that's something that we'll address at
- 19 some point in time. But I wanted to bring it up
- 20 so that it's an item that we can give some future
- 21 thought to as it comes about.
- 22 CHAIRMAN MORELOCK: Okay. Next
- comment is on Item 3. It's on page 13.
- MS. JEFFERSON: Now, Chairman,
- 25 before we move on, were you-all comfortable with

- 1 that response?
- 2 CHAIRMAN MORELOCK: Yes. I mean,
- 3 nobody is objecting to it.
- DR. CANONICO: I agree. In
- 5 retrospect, if you wait for the Board, you're
- 6 talking a minimum of three months or four months.
- 7 And you can't get excited, but, I mean, if someone
- 8 wants to reinstall something and they waited that
- 9 long to reinstall it, they can wait another month
- or two. But I'll accept it. I have no problem
- 11 with it.
- 12 CHAIRMAN MORELOCK: Okay. Page 13,
- 13 Item 8(c).
- 14 DR. CANONICO: This is one I have a
- 15 real hangup on.
- 16 CHAIRMAN MORELOCK: Okay. The
- 17 comment from Dr. Canonico is, "What if the
- 18 original manufacturer is no longer in business?
- 19 If that is the case, should the boiler or pressure
- vessel be scrapped? If that is the case, then why
- 21 don't we say so?"
- 22 And this is concerning restamping of
- 23 boilers and pressure vessels, which is the
- heading -- if you go back to page 12, it's Item 8,
- 25 Restamping of Boilers and Pressure Vessels.

```
1
                   And if we read (c) -- I'm going to
 2
      read (c) the way the Boiler Unit is going to
 3
      respond to that. But let me go ahead and read
 4
      their response. The Boiler Unit response is, "No,
 5
      the vessel should not be scrapped."
                     DR. CANONICO: Excuse me. "Should
 6
 7
      be scrapped" is like a 2 by 4 to gain attention.
 8
                     CHAIRMAN MORELOCK: Okay. Well,
      they're responding to your 2 by 4. "No, the
 9
      vessel should not be scrapped. The vessel history
10
      is available and the replacement parts, if needed
11
      by the owner, can be purchased from another
12
13
      manufacturer. Also, the phrase 'Chief Inspector'
      should also include 'or the Chief Inspector's
14
15
      designee.'"
16
                   Which all the green text that you see
17
      is where we went through the whole body of
18
      0800-03-03 and added that in every instance.
      think it was, like, 64 instances where we added
19
      that.
20
21
                   So to read 8(c) as proposed now, "The
22
      ASME Certification Mark with Certification
23
      Designator may be restamped only by the original
24
      manufacturer of the boiler or pressure vessel in
```

the presence of an inspector of the Authorized

25

- 1 Inspection Agency who signed the Manufacturer's
- 2 Data Report or a Deputy Inspector. The witnessing
- 3 inspector shall file with the Chief Inspector or
- 4 Chief Inspector's Designee the completed and
- 5 signed 'Replacement of Stamped Data Form' with a
- 6 facsimile of the stamping applied."
- 7 So to put that in perspective, ASME
- 8 is going through the process now to where if the
- 9 original manufacturer is still in business, they
- 10 still have their stamps, they can actually restamp
- 11 the mark on the nameplate. And then you have to
- have an inspector witness the application of it.
- 13 If that's not possible, Plan B, which
- is more prevalent, is you use the NBIC NB Form 136
- to stamp a replacement nameplate without the
- original stamping, and it says "Replacement" on
- 17 it. And either one of those will allow the vessel
- 18 to return to service.
- DR. CANONICO: What if it's not
- 20 registered with NBIC?
- 21 CHAIRMAN MORELOCK: Well, then your
- options are you've got to try to bring it through
- as a State Special. Because we've actually got a
- 24 Board case out on the website right now that if a
- 25 vessel loses its nameplate and you can't prove

- what it is through previous registration with the
- 2 State of Tennessee, or something like that, then
- 3 it becomes a State Special if you want to register
- 4 it with the State. I can't tell you the --
- DR. CANONICO: But you can't
- 6 restamp it?
- 7 CHAIRMAN MORELOCK: No.
- DR. CANONICO: You can come back as
- 9 a State Special?
- 10 CHAIRMAN MORELOCK: Yes.
- 11 DR. CANONICO: Which means that
- they have to have a lot of information.
- 13 CHAIRMAN MORELOCK: That's correct.
- 14 Not only do you have to have a lot of information,
- if you jump that hurdle, all repairs have to be
- approved by Sam, and all alterations have to be
- 17 approved by the Tennessee Board. So it's an
- 18 arduous process. That's the 2 by 4 to make sure
- 19 you don't lose your nameplate.
- MR. JACKSON: But you have to buy
- another 2 by 4.
- 22 CHAIRMAN MORELOCK: So any comments
- on the proposed 8(c)?
- 24 (No verbal response.)
- 25 CHAIRMAN MORELOCK: Okay. I'm

- 1 assuming silence means everybody is okay with
- that. So we'll call that okay and we'll proceed
- 3 with that.
- 4 Comment Number 4 is on page 17,
- 5 Item 3(b).
- 6 DR. CANONICO: Yeah. I had trouble
- 7 with degrees in experience.
- 8 CHAIRMAN MORELOCK: Okay. The
- 9 comment is, "The three requirements under this
- 10 area are not equivalent; i.e. a degree in
- mechanical engineering (3)(b)1 versus (3)(b)3 in
- 12 my mind are not equivalent."
- 13 Boiler Unit response to this comment
- is, "Not sure if changing a high school education,
- or the equivalent, plus five years to six years is
- 16 what the author is referring to. Further
- 17 discussion and clarification is needed as to what
- 18 requirements are needed to be consistent with the
- 19 National Board's requirement. If referring to
- 20 Part 3 above, the Boiler Unit suggests modifying 3
- above to require a high school education or the
- 22 equivalent plus six years of experience."
- Now, what is shown in the boxes in 1
- 24 and 3 -- let's go back and kind of get the context
- of what we're asking for here. Item 3 is where

- 1 you take the commissioning exam. Okay? It's the
- 2 examination for certificate of competency. And
- 3 this outlines what you have to provide in order to
- 4 apply for the exam.
- 5 And so 3(b) says, "An applicant for
- 6 examination shall have education and experience
- 7 equal to at least one of the following: "Not all
- 8 three. You've got to satisfy one of the three
- 9 requirements. Item 1 being "A degree from an
- 10 accredited school in mechanical engineering, plus
- one year of experience in design, construction,
- operation or inspection of high-pressure boilers
- and pressure vessels."
- 14 Number 2 would be "A degree from an
- 15 accredited school in a branch of engineering other
- than mechanical engineering or an associate degree
- in mechanical technology, plus two years of
- 18 experience in design construction, operation or
- inspection of high-pressure boilers and pressure
- 20 vessels; or Number 3, a high school education, or
- 21 the equivalent, plus three years of experience in
- 22 high-pressure boiler and pressure vessel
- 23 construction or repair; or as an operating
- 24 engineer in charge of high-pressure boiler
- operation; or as an inspector of high-pressure

- boilers and pressure boiler operation."
- 2 So those are the -- that's the
- 3 proposed text.
- 4 Now, NB369 is a document for
- 5 requirements for an inspector. I agree that we
- 6 need to make sure that our requirements match
- 7 what's in the National Board document, so ...
- 8 I don't have that document in front
- 9 of me, though. So I guess my recommendation is,
- is that Sydne and I just need to verify that 1, 2,
- and 3 match NB369, is what we need to do. Is
- 12 there any opposition to that, or should we -- is
- there something we would rather have?
- DR. CANONICO: Well, I still have a
- 15 little bit of heartburn over Number 2, where an
- 16 associate degree in mechanical engineering,
- 17 mechanical technology, plus two years of
- 18 experience. You have either a degree from an
- 19 accredited school in a branch of engineering, plus
- 20 two years of experience, or an associate's degree
- 21 plus two years of experience.
- I mean, one is essentially getting a
- 23 mechanical engineering degree, and the second one
- is a local trade school, if you will. I don't
- 25 consider those as being equivalent.

- 1 CHAIRMAN MORELOCK: But I don't
- 2 think all of our commission inspectors have
- 3 mechanical engineering degrees.
- 4 DR. CANONICO: No. Nor should
- 5 they. If we could go back to where everybody had
- 6 experience on the ship with boilers, we'd all be
- 7 happy. That would take care of my heartburn with
- 8 Neville and others.
- 9 CHAIRMAN MORELOCK: Now, doesn't 3
- 10 really kind of cover the military experience, the
- 11 navy? Isn't that what Item 3 covers, the high
- 12 school education and the three years of
- 13 experience? Those were to satisfy those
- 14 requirements, I believe.
- DR. CANONICO: Yes.
- 16 CHAIRMAN MORELOCK: So if --
- 17 MR. JACKSON: I don't know about
- 18 Eugene's company, but most companies now that are
- 19 hiring inspectors are looking at the nuclear
- 20 industry. Them fellows in the nuclear industry
- 21 are far more trained than the old boiler
- inspectors, and they have an education equivalent
- 23 to a mechanical engineer basically.
- 24 For them to get their Dolphins and to
- 25 get their other position they get, them guys are

- 1 sharp.
- 2 CHAIRMAN MORELOCK: Okay. So if we
- 3 can confirm this matches NB369, will that be
- 4 satisfactory?
- DR. CANONICO: Yes.
- 6 CHAIRMAN MORELOCK: All right. I
- 7 will follow up with that. I will check NB369 for
- 8 that. And I will send that out to the board
- 9 members via email with the paragraphs out of NB369
- 10 as compared to this.
- 11 MS. JEFFERSON: Because it's true
- that we can't require more than what the national
- 13 requires.
- 14 CHAIRMAN MORELOCK: Oh, you can.
- 15 MS. JEFFERSON: Well, we can, but
- we probably wouldn't want to do that. We probably
- 17 want to be equivalent and consistent with what the
- 18 national will require.
- 19 CHAIRMAN MORELOCK: Yes. Okay.
- MR. JACKSON: You get too stringent
- 21 and it takes your pool too small.
- 22 CHAIRMAN MORELOCK: It does. It
- 23 certainly does.
- So Item 5 is on page 19,
- 0800-03-03-07(1). The second sentence is an

- 1 incomplete sentence. The Boiler Unit response is,
- 2 "The above statement appears correct."
- 3 So if we read all of 1, "Repairs and
- 4 alterations shall not be made without the
- 5 permission of an inspector employed by an
- 6 accredited Authorized Inspection Agency
- 7 responsible for the in-service inspection of the
- 8 subject boiler or pressure vessel," period.
- 9 Then the second sentence reads, "Such
- 10 repairs and alterations shall be done in
- 11 accordance with the NBIC." Instead of spelling
- 12 that out, that acronym has been defined earlier in
- the rules, and so it will be referred to as "NBIC"
- 14 afterward.
- Then the last sentence says, "The
- inspector authorizing the repair or alterations
- shall sign the necessary NB" -- which is an
- 18 acronym for National Board -- "NB-R form or
- forms, period. So is that okay?
- 20 (No verbal response.)
- 21 CHAIRMAN MORELOCK: Okay. So that
- 22 one is okay.
- 23 Continuing on with Item 2 in the same
- 24 Section VII, "Correct the last two lines; perhaps,
- 25 Authorization for the use of, et cetera."

- 1 The Boiler Unit's response to this
- 2 comment is, "The above statement appears to be
- 3 correct. Need further clarification, discussion,
- 4 or additional information in order to consider
- 5 possible changes."
- 6 So reading 2, the person,
- 7 corporation, partnership, or firm performing the
- 8 repair or alteration shall have a valid license in
- 9 accordance with Tennessee Code Annotated
- 10 paragraphs 68-122-202.
- MR. JACKSON: 01.
- 12 MS. EWELL: Correction. It should
- 13 be TCA Section -- actually, there were two there
- 14 previously. We need to cross out one of the
- 15 section symbols. And the correct cite is
- 16 68-122-202. The information in red is correct,
- 17 not the entire section of the code.
- 18 CHAIRMAN MORELOCK: So we need to
- 19 get rid of one of the section symbols, just have
- 20 one?
- MS. EWELL: Yes.
- 22 CHAIRMAN MORELOCK: Okay. And then
- 23 68-122-202 is correct, right?
- MS. EWELL: Right. I can't tell if
- there's a strike-through on here or not, but there

- 1 should be a strike-through.
- 2 CHAIRMAN MORELOCK: There's a
- 3 strike-through on the 1 and then there's a red 2,
- 4 but the --
- 5 MS. EWELL: I'm talking about the
- 6 symbol.
- 7 CHAIRMAN MORELOCK: Yeah. I don't
- 8 know if the symbol --
- 9 MS. RHONE: No, there's -- huh-uh.
- 10 I can't see a strike-through right here.
- 11 CHAIRMAN MORELOCK: Okay. And
- 12 then, "In order to qualify for such license, the
- 13 applicant shall have a valid certificate of
- 14 authorization from the NB for use of a repair code
- 15 symbol stamp, " period.
- 16 Again, the National Board has been
- 17 defined as NB. So if we strike out that first
- 18 section symbol that would be the only change. Is
- 19 that okay?
- 20 (No verbal response.)
- 21 CHAIRMAN MORELOCK: All right.
- Item 7 takes us to page 24. And this
- is going to be under Item 3, "Maximum Allowable
- Working Pressure for Nonstandard Boilers."
- 25 And this comment from Dr. Canonico

- 1 applies to basically Factor of Safety or
- definition of FS. His comment was, "Define 'FS,'
- 3 Factor of Safety. That terminology is not used in
- 4 the ASME Code. All of the requirements of the
- 5 Code provide a level of safety. If the rules mean
- 6 that the mechanical properties are divided by a
- 7 number, we should identify what we mean by FS."
- 8 Boiler Unit response, "The FS, Factor
- 9 of Safety, information shall be provided to the
- 10 authorized inspector by the owner/user. Need
- 11 further clarification, discussion, or additional
- information in order to consider possible changes.
- 13 We defer to the Board on this question."
- Dr. Canonico's follow-up email, "As I
- 15 said in my comments, this is no 'FS' in Section I.
- Rather, I would reword the first sentence to read,
- 17 "determined in accord with Section I, PG-21 and
- 18 PG-27. Delete the rest of (3)(a)."
- 19 Okay. So what you see in the text
- 20 now is Dr. Canonico's comments, which I've already
- 21 read. And then the other comment would be, "In
- this day and age, we should not allow material
- 23 that has no pedigree. This is an area that should
- 24 be cleaned up."
- 25 So here is an area where we need to

- decide -- how do we want this to read?
- DR. CANONICO: Well, we
- 3 specifically got away from the words "Factor of
- 4 Safety" because the argument was that there are
- 5 many aspects of the Code that contribute to
- 6 safety. And when they're talking about Factor of
- 7 Safety, the way it's being used here is the
- 8 division of the tensile properties or yield
- 9 strength properties -- yield strength -- and
- 10 that's different than Factor of Safety.
- I mean the equation is given in 21
- 12 and 27. So I just -- I think the words "Factor of
- 13 Safety" condones or kind of makes it sound like
- 14 got something going for you that you really don't
- 15 have. But is it all inclusive? I think this has
- 16 been there a long time.
- 17 CHAIRMAN MORELOCK: It has.
- MR. JACKSON: It has.
- DR. CANONICO: And it probably
- 20 dates back to the year one.
- MR. JACKSON: Yeah, before me.
- DR. CANONICO: When maybe at that
- time, in 1914, they may have used the words like
- 24 Factor of Safety. I don't know. I have a copy.
- 25 CHAIRMAN MORELOCK: Would we want

- 1 to impose a code equation for a nonstandard
- 2 boiler?
- DR. CANONICO: Well, you do it all
- 4 the time when you do a calculation.
- 5 CHAIRMAN MORELOCK: I do. I'm just
- 6 asking a question.
- 7 DR. CANONICO: If somebody comes in
- 8 and wants a State Special, you do all the
- 9 analysis.
- 10 CHAIRMAN MORELOCK: I do.
- 11 DR. CANONICO: And I look at the
- materials but I'm not looking for a Factor of
- 13 Safety in those materials.
- 14 CHAIRMAN MORELOCK: Right. You're
- 15 looking for a design margin.
- DR. CANONICO: I'm looking at that
- or is it a reasonable material to be used. You
- 18 know, frequently they come in with foreign specs
- 19 that don't make sense. But I just don't think
- 20 Factor of Safety is the right terminology. But if
- 21 everybody is happy with it ...
- MR. JACKSON: Is this the only
- 23 place it's used in the law?
- 24 CHAIRMAN MORELOCK: I think there
- 25 was a similar equation for nonstandard pressure

- 1 vessels as well.
- 2 MR. JACKSON: Because I was going
- 3 to say if it's identified elsewhere, its
- 4 application may be different than the first one.
- 5 MS. EWELL: Look on page 25.
- 6 Dr. Canonico, is there any language
- 7 in the section you cited, in Section I, PG-21 and
- 8 PG-27, that we could use?
- 9 DR. CANONICO: I can look it up and
- 10 I'll get back to you on that.
- 11 MR. JACKSON: Yeah. What I was
- 12 thinking is what if we put a definition? And the
- definition puts Factor of Safety, and then as it
- applies to -- however the words would go.
- DR. CANONICO: I'm trying to think.
- I may be wrong but I can't remember anywhere that
- 17 it talks about a Factor of Safety anymore in the
- 18 Code.
- MR. JACKSON: No, it doesn't. I
- 20 agree with you. But if we wanted to -- if we --
- 21 shall I say if we mess too much with this --
- DR. CANONICO: They're looking at
- that division factor for tensile properties.
- MR. JACKSON: Yeah.
- DR. CANONICO: You know, it went

- from 5 before World War II, went to 4 during World
- War II to conserve material, went back to 5, and
- 3 then shortly thereafter went to 4. And then about
- 4 ten years ago we changed it to 3.5.
- 5 CHAIRMAN MORELOCK: That's correct.
- 6 DR. CANONICO: But that's a
- division factor, and it's given in, if I remember,
- 8 Appendix 100 of Section I at least. And perhaps
- 9 there's a similar one in Section VIII.
- 10 MR. ROBINSON: Where is it actually
- located for when you perform code counts? Because
- 12 I know that when you perform code counts, there is
- a multiplier that you're supposed to include.
- DR. CANONICO: It's already done
- for you in the allowable stresses.
- 16 CHAIRMAN MORELOCK: Section II(d),
- it's already been applied.
- 18 MR. JACKSON: You take the penalty
- 19 there.
- DR. CANONICO: What you call
- 21 Factor -- I can bring it back next time, but what
- you call Factor of Safety is really a division
- factor in setting the allowable stresses.
- MR. ROBINSON: Correct. Yes.
- 25 CHAIRMAN MORELOCK: That's why all

- 1 piping and tubing is considered a joint efficiency
- of one so you don't penalize it twice.
- 3 MR. ROBINSON: Exactly.
- 4 CHAIRMAN MORELOCK: Because it's
- 5 already considered in a product form.
- MR. ROBINSON: Hundred percent.
- 7 CHAIRMAN MORELOCK: On page 33 of
- 8 our rules, we have the same issue for existing
- 9 pressure vessels. We have a similar equation or
- 10 an identical equation, actually. But there's a
- 11 note at the bottom of it that says -- where TS is
- 12 equal to the ultimate tensile strength of shell
- 13 plate. But there's a note under it that says,
- 14 "When the tensile strength is not known, assume
- 15 55,000 psi for temperatures not exceeding
- 16 650 degrees F. For other materials, use the
- 17 lowest stress values for that material from ASME
- 18 Code Section VIII, " which would really be
- 19 Section II part (d).
- 20 DR. CANONICO: Yes. That should be
- 21 changed. And they picked 650 because that's below
- 22 creep, even for carbon steels.
- 23 CHAIRMAN MORELOCK: So what do we
- 24 want to do? I mean, we can include the Section I
- 25 equation.

- 1 DR. CANONICO: And Section VIII
- 2 equation.
- 3 CHAIRMAN MORELOCK: And the Section
- 4 VIII --
- DR. CANONICO: If we had to. If
- 6 they're different enough.
- 7 CHAIRMAN MORELOCK: Well, UG-27 and
- 8 PG-27 can be identical depending on what the
- 9 constants are in Section I. They can be
- 10 identical. But --
- 11 DR. CANONICO: Whatever is in
- 12 Section II, part (d), Table 1-A, as for both
- 13 Section VIII and Section I, the allowable
- 14 stresses. And they all have had the tensile
- properties divided by 3.5.
- 16 CHAIRMAN MORELOCK: That's right.
- 17 So what is -- what do we want to do on page 24?
- 18 DR. CANONICO: My suggestion is we
- 19 take a look at it and use the equations that are
- in the books. That would be the safest thing to
- 21 do.
- MR. ROBINSON: I agree.
- MR. JACKSON: Are you going to
- 24 address it at the other locations also?
- DR. CANONICO: Excuse me?

- 1 of it.
- MR. JACKSON: You've got riveted
- 3 boilers.
- 4 MR. ROBINSON: Yes.
- 5 CHAIRMAN MORELOCK: They have a
- 6 whole set of rules for those.
- 7 MR. ROBINSON: I know, Sam, you get
- 8 involved with -- you know, every time they have a
- 9 show in Portland and Clarksville, you're there.
- MR. CHAPMAN: Yes.
- MR. ROBINSON: And then these guys,
- 12 they also go for recertifications. And I'm not
- 13 sure of the frequency, but ...
- 14 MR. CHAPMAN: It's still once a
- 15 year.
- DR. CANONICO: Well, you people
- should think about it because you're the ones that
- 18 have to live with it. But the terminology is not
- 19 correct -- that's the only point I'm making -- as
- 20 used now. Whether you like having the equations
- 21 in there is another question. We can take a look
- 22 at that in the next couple of weeks.
- 23 CHAIRMAN MORELOCK: Right. Because
- this is just the discussion. So, I mean, another
- 25 way of looking at that is you leave the equation

- 1 as is, you change FS to DM, or whatever you want
- 2 to call it. You change Factor Safety to Design
- 3 Margin. And then you put a note in there, if the
- 4 material cannot be clearly identified, you must
- 5 assume a Design Margin of 5. That would be the
- 6 most restrictive Design Margin that you would have
- 7 to use, or something like that.
- DR. CANONICO: I was going to
- 9 suggest that under "FS" there, you just put a
- 10 number in like 3.5. It's really what --
- 11 CHAIRMAN MORELOCK: Well, but on
- 12 your older materials, you would want it to be more
- 13 than that. You wouldn't want to get away with RIM
- steel being 3.5. You would want 4 or 5 on it,
- 15 wouldn't you?
- DR. CANONICO: Yes.
- 17 CHAIRMAN MORELOCK: You don't want
- 18 to let that 368 material slide through with a
- 19 Design Margin of 3.5. And the reason being, we
- 20 would be contradicting our own Board because we
- 21 specifically put a Board case through in '98
- 22 stating that you can't do a paper rerate on a
- vessel using the higher allowable stresses.
- DR. CANONICO: Redesign it.
- 25 CHAIRMAN MORELOCK: Right. You

- 1 can't do that. So we would have to make it 4 or
- 2 5. So do we want to work on that a little bit
- 3 more?
- 4 MR. JACKSON: Yes.
- DR. CANONICO: My thinking is yes.
- 6 CHAIRMAN MORELOCK: Okay. All
- 7 right. We will work on this item some more, and
- 8 we will converse through emails to hash it out.
- 9 (Whereupon, a discussion off the
- 10 record occurred.)
- 11 CHAIRMAN MORELOCK: And as Eugene
- 12 astutely reminded me, this is an open meeting, so
- if anybody has an opinion about that, please get
- 14 it to us. You're welcome to express how you think
- this should read. This is why we have open
- 16 meetings.
- MR. JACKSON: That's why we
- 18 referred it to the Board.
- 19 CHAIRMAN MORELOCK: That's right.
- 20 So let us know what you think. Please do.
- 21 All right. I'm going to label that
- as "more work." So we're going to leave that one
- as an open item needing more work.
- DR. CANONICO: That was page 24.
- Where was the other one?

- 1 CHAIRMAN MORELOCK: 33.
- DR. CANONICO: Okay.
- 3 CHAIRMAN MORELOCK: Page 33 will be
- 4 the same way. We actually didn't comment on it
- 5 but this is going to need more work as well.
- 6 MR. FINKS: It's on page 34 on my
- 7 copy, I believe.
- 8 CHAIRMAN MORELOCK: Okay. It does
- 9 bleed over to 34. That's correct. It starts on
- 10 33.
- MR. JACKSON: What page was that,
- 12 Mark?
- MR. FINKS: Page 34.
- DR. CANONICO: 34 and 35. It just
- 15 flows over to the second page.
- 16 CHAIRMAN MORELOCK: Yes, it does.
- 17 Right. Okay. So 24, 25 and 34, 35 both need more
- work.
- DR. CANONICO: And I think that
- 20 takes care of me.
- 21 CHAIRMAN MORELOCK: Okay. Now,
- going back, we're going to look at Mr. Baughman's
- 23 comments. And we'll start on page 5 with his
- 24 comments, Item 23. His question is, "What license
- is requested and where does the contractor obtain

- such license as what is defined by 'Repair'?"
- So on page 5, Item 23 reads,
- 3 "Licensed Boiler Erectors and Repairers Contractor
- 4 means a person, corporation, partnership or firm
- 5 authorized to engage in the repair or erection of
- 6 steam boilers, steam kettles, pressure tanks, or
- 7 steam generators."
- 8 And the Boiler Unit Response to this
- 9 is, "The required licensure information is as
- 10 follows: State of Tennessee Department of Labor
- and Workforce Development, State Board of Boiler
- 12 and Pressure Vessel Rules for Licensing Boiler and
- 13 Pressure Vessel Erector, and Boiler and Pressure
- 14 Vessel Repair and/or Alteration Contractors."
- 15 Parenthetical, "Repair license. Such license may
- 16 be obtained from the Boiler Unit."
- 17 "Is this license actually required
- since the definition of 'Repair' does not
- 19 specifically state repairs to the pressure vessel
- such as welding, et cetera?"
- Boiler Unit Response, "Yes, the
- 22 National Board, NBIC, requires licensure."
- 23 "According to the listed definition
- of 'Repair,' could this constitute repairs to the
- 25 controls or burner, which in that case would not

```
1 require an 'R' stamp code repair from an
```

- 2 authorized license boiler repair contractor?"
- Boiler Unit Response, "The boiler
- 4 rules identify the pressure boundary. These
- 5 repairs relate to pressure."
- 6 MR. BAUGHMAN: And my question to
- 7 that was the definition of "repair" in our rules
- 8 under 38, it says, "Repair means the work
- 9 necessary to restore a boiler or pressure vessel
- 10 to a safe and satisfactory operating condition
- 11 provided there's no deviation from the design."
- 12 Well, repair and -- we can assume
- that "Repair" means pressure vessel, but it's that
- 14 assumption. And there's been questions brought up
- to me, "Do I need a license to repair the
- 16 controls? Do I need a license to work on the
- 17 boiler? Do I need a license to repair the control
- 18 panel?" Whatever the case may be.
- 19 And under the definition of "Repair,"
- 20 that's where I wanted to expand upon that, because
- 21 NBIC gives definitions for licensing, but I wanted
- 22 to make sure that we were clear on what repairs
- 23 needed to have licensure for. And that would
- 24 be -- and the Board says -- or at least the
- 25 response from the Boiler Unit says that a license

- is required. And it works within the pressure
- 2 boundaries. The boiler rules identify the
- 3 pressure boundaries. These repairs relate to
- 4 pressure, but it doesn't really clarify that under
- 5 our definition of "Repair," I believe.
- 6 So I just wanted to make sure that
- 7 we're clear. If there's any room for
- 8 interpretation, then we need to make sure that
- 9 there is no room for interpretation; that it's a
- 10 clear definition that "repair" is specific to the
- 11 pressure vessel itself.
- 12 CHAIRMAN MORELOCK: Okay.
- MR. JACKSON: What's your
- 14 suggestion?
- MR. BAUGHMAN: To open it up for
- 16 discussion. I would identify that definition of
- 17 "Repair" to identify it specifically. If we're
- 18 correlating "Repair" in our definition to the
- 19 requirement of licensing a boiler contractor that
- is engaged in repair, the repair needs to be
- 21 clearly identified, since we're requesting that
- license, that it's repair to a pressure vessel.
- 23 MR. ROBINSON: That's a struggling
- 24 problem. And I'm surprised Brian didn't jump in.
- 25 CSD-1 and National Board have struggled for years

- 1 to talk to one another. The problem is is that
- they haven't come to any resolution.
- 3 Your point is well taken. The
- 4 pressure boundary proper is what it is. It's
- 5 pressure; face flange; first well. You've got it.
- 6 All in the preamble.
- 7 CSD-1 says all gas control components
- 8 or safety devices. NBIC doesn't -- they don't
- 9 talk. They don't recognize one another.
- 10 So what had happened was years ago,
- 11 CSD-1 -- well, it was NBIC -- came out and they
- said that we will adopt something and make it
- mandatory that you have to have a certification
- 14 before you work on a gas train. Now, I can't
- 15 remember if it was CSD-1 or National Board, but it
- 16 never happened.
- 17 MR. BAUGHMAN: Well, and this is --
- 18 to bring that conversation up -- this forces the
- issue with what we're identifying in our own rules
- 20 within our state.
- 21 MR. ROBINSON: Right. That's the
- 22 big question.
- 23 MR. BAUGHMAN: That's kind of why I
- let the cat out of the bag with it, is that --
- 25 MR. ROBINSON: Now, let me ask you,

- 1 as a service entity, you provide a service to
- 2 everyone in Tennessee. When you come upon a gas
- 3 train, you don't obviously have a license, because
- 4 there's not.
- 5 MR. BAUGHMAN: That's true.
- 6 MR. ROBINSON: So the question
- 7 would be, now, are we willing to impose a
- 8 restriction to say that everyone who performs work
- 9 on a CSD-1 configuration is licensed? Now --
- MR. BAUGHMAN: Because we do
- 11 testing for CSD-1, we do all the tests and we do
- everything to supply that information to the
- 13 required agencies and so forth, what I would like
- for the "Repair" definition, and since our state
- 15 requires a license for the repair, is that that
- license be identified for the pressure vessel
- 17 repair, that it's separated out and just say --
- and that's really how our state is set up.
- MR. ROBINSON: NBIC?
- 20 MR. BAUGHMAN: That's right. And
- 21 that's how we're presently set up. But it doesn't
- 22 necessarily say that. And so I would like that
- 23 wording to be in there for more clarification for
- the pressure vessel side of the repair.
- 25 CHAIRMAN MORELOCK: I think it's

- 1 already in there.
- 2 MR. BAUGHMAN: No. Under 38
- 3 presently, it just says "Repair" under --
- 4 presently on page 5.
- 5 CHAIRMAN MORELOCK: Well, let me
- 6 get beyond the definitions here to -- yeah, see,
- 7 if you go to Construction Standards on page 8,
- 8 Item 1 says, "No boiler or unfired pressure vessel
- 9 shall be installed for operation in the state of
- Tennessee, unless it's designed, constructed,
- inspected, stamped, and installed for the desired
- 12 pressure and temperature according to the
- provisions of this chapter, the applicable section
- of ASME Code and other applicable law."
- 15 2 talks about National Board stamping
- and registration. And then when you get over into
- the repairs of a pressure vessel, it says thou
- shalt do repairs to the pressure boundary per
- 19 NBIC, so ...
- 20 MR. BAUGHMAN: We just need to make
- our definition match up. And that's what I'm
- 22 saying, in our present code book now, the "Repair"
- definition doesn't match up pressure boundary.
- MS. JEFFERSON: Pressure boundary.
- Look on page 6, 38. So what will be changed

- 1 there? Because it does include -- it says
- "restore a boiler or pressure vessel to a safe" --
- 3 CHAIRMAN MORELOCK: And see, what
- 4 we've added to that from what's out on the website
- 5 today is in red. See NB NBIC part 3, Section III,
- 6 Repairs and Alterations. And that's clearly going
- 7 to define that. And you're not going to find any
- 8 CSD. Like Eugene said, there's no reference to
- 9 controls in any of that text.
- 10 MR. BAUGHMAN: So in our rules book
- 11 now, under where the definition for "Repair" will
- be, that will have a reference back to --
- 13 CHAIRMAN MORELOCK: Part 3.
- 14 MR. BAUGHMAN: Part 3. Okay.
- 15 CHAIRMAN MORELOCK: It's not there
- 16 today.
- MR. BAUGHMAN: It's not there
- 18 today. Okay. Cool.
- 19 CHAIRMAN MORELOCK: But it will be.
- I mean that's in red now. So will that satisfy
- 21 all of your concerns?
- MR. BAUGHMAN: I think so.
- 23 CHAIRMAN MORELOCK: Well, but now
- 24 what about -- so now what are you going to do
- about those repairs, those CSD-1 repairs?

- MR. BAUGHMAN: That comes along, I
- think, when we get to talking about -- that's
- 3 probably down the road.
- 4 MR. ROBINSON: At the National
- 5 Board level, have you heard any discussion?
- 6 Because I'm sure it's ongoing.
- 7 CHAIRMAN MORELOCK: Yeah. That's
- 8 just where it's at. It's ongoing.
- 9 MR. JACKSON: Yeah. And will be
- 10 ongoing.
- 11 CHAIRMAN MORELOCK: And will be.
- 12 Kind of like temper bead welding for Section VIII.
- 13 MR. JACKSON: I don't feel the
- 14 State of Tennessee wants to get into that, not at
- 15 this time. It's too volatile and too up in the
- 16 air. And there's no hard criteria other than the
- 17 CSD-1 itself. And that jumps into some stuff that
- 18 I don't think the State of Tennessee wants to get
- 19 into.
- 20 MR. ROBINSON: You know, I used to
- 21 have in my little -- I call it a "ditty bag," it's
- 22 all my little documents -- where I had a statement
- from Honeywell that disallowed anyone that didn't
- know what they were doing, so to speak, to work on
- their gas components, gas train components. And

- 1 I'll just resurrect that and see what it says as
- far as the verbiage, but this was dated eons ago,
- 3 so it's probably not going to be relevant.
- 4 MR. BAUGHMAN: I'm sure it's like
- 5 for us to get factory training with Siemens or
- 6 Honeywell or Fireye, any of the systems that are
- 7 out there, I think the thing that I would rather
- 8 take on before any of that is the qualifications
- 9 of the contractors putting stuff in,
- 10 qualifications of people operating boilers. I
- 11 think that's the fight that I would rather take
- before we prolong the other one.
- MR. ROBINSON: Okay.
- 14 CHAIRMAN MORELOCK: Okay. So 23
- 15 and 38 are okay the way they are in this draft --
- MR. BAUGHMAN: Yes.
- 17 CHAIRMAN MORELOCK: -- with the
- 18 changes in red.
- MR. BAUGHMAN: Yes.
- 20 CHAIRMAN MORELOCK: Okay. So that
- 21 will satisfy those. Now, let's go on down to 2.
- "How is a boiler designated if it's removed from
- its original setting, has changed location but not
- 24 ownership?"
- 25 Boiler Unit response is stated on

- 1 pages 6 through 7, Item 37, "The rules reclassify
- 2 this as a reinstallation because the ownership has
- 3 not changed."
- 4 MR. BAUGHMAN: But the question is
- 5 what if it's been removed from its original
- 6 setting and it's changed location?
- 7 CHAIRMAN MORELOCK: Then it becomes
- 8 secondhand.
- 9 MR. BAUGHMAN: Well, but secondhand
- 10 says that it has to change both location and
- ownership. What if it hasn't changed ownership?
- 12 It doesn't meet that criteria either. So the
- 13 question being -- is if it's been removed from its
- original setting, has changed locations but
- 15 changed -- and it has not changed ownership --
- 16 CHAIRMAN MORELOCK: But see, we,
- 17 being Eastman, we deal with that all the time and
- 18 we always call them secondhand.
- 19 MR. BAUGHMAN: I understand. But
- according to the definition of what we've got
- 21 written, it doesn't meet it. Because right now it
- says, "A reinstalled boiler or pressure vessel
- 23 means a boiler or pressure vessel removed from its
- original setting and reinstalled at the same
- location without change of ownership.

- 1 "A secondhand boiler or pressure
- 2 vessel means a boiler or pressure vessel which has
- 3 changed both location and ownership.
- 4 CHAIRMAN MORELOCK: Oh, so if we
- 5 put "and/or ownership," would that satisfy it?
- 6 MR. BAUGHMAN: That's why I brought
- 7 it up.
- 8 CHAIRMAN MORELOCK: Okay.
- 9 MR. BAUGHMAN: The present
- 10 definition is not correct to the extent of how
- 11 it's written.
- 12 CHAIRMAN MORELOCK: What we're
- stressing above what the words say is that we have
- 14 glass-lined vessels that we routinely remove. We
- send them to Pennsylvania, we have them reglassed,
- we bring them back. Sam has to know every time
- 17 that happens. And it happens a lot. So he gets a
- 18 lot of requests to bring it back into the state.
- MR. BAUGHMAN: Sure.
- 20 CHAIRMAN MORELOCK: If we move
- 21 something from any of our 43 plant sites into
- Tennessee, we send him a request to bring that in
- as secondhand. But it's the same form for both.
- MR. BAUGHMAN: It's the same form.
- 25 All we need to do is clarify the definition.

ownership you have --

but there's one address for that big blob of ...

MR. JACKSON: But there's an

23

24

25

1 CHAIRMAN MORELOCK: I mean, this is 2 the same argument that accreditation people get 3 into with Certificate of Authorization. If they 4 buy a shop two doors down, do they need two 5 certificates or one? And then you get into this, 6 well, how far can I go? And it's gone from one extreme to the other. They're still fighting 8 that. 9 MS. RHONE: What do you think? 10 Is --11 If you tear down a MR. CHAPMAN: building onto that and build a newer building, but 12 you're going to put your boiler back into that ... 13 14 CHAIRMAN MORELOCK: Yeah. It's the 15 same location but it's a new building. 16 MR. CHAPMAN: That's all it is. 17 MR. BAUGHMAN: And you've got 18 rental boilers that are being moved from one 19 location to the other. We own the rental boiler, but it's going to a different location, but it 20 21 hasn't changed ownership. 22 CHAIRMAN MORELOCK: Right. 23 MR. BAUGHMAN: So I would just 24 say --

MR. ROBINSON: But it's classified

25

- 1 as a rental boiler.
- MR. BAUGHMAN: Yes. But --
- MR. ROBINSON: That's the category.
- 4 CHAIRMAN MORELOCK: And it's also
- 5 classified as a temporary installation.
- 6 MR. ROBINSON: But that's the
- 7 caveat.
- 8 MR. BAUGHMAN: That's true.
- 9 MR. ROBINSON: That's the caveat.
- 10 MS. RHONE: And the installation
- 11 application is applied for each time.
- 12 MR. BAUGHMAN: Let's say that they
- end up buying the boiler, what I'm looking at is
- 14 that I think the part of knocking ownership out of
- 15 the secondhand part of that definition works out
- 16 well because it's just changed the location. It
- hasn't necessarily changed ownership.
- 18 MR. ROBINSON: Ownership. Agreed.
- 19 Sam?
- MR. CHAPMAN: Yeah.
- 21 CHAIRMAN MORELOCK: So is that
- 22 agreeable to everybody? I mean this a discussion,
- 23 so if go home and think about it and don't like
- it, you can always change your mind.
- 25 MR. BAUGHMAN: Any other thoughts

- 1 on that from anybody?
- 2 CHAIRMAN MORELOCK: So for now
- 3 we're going to -- for the moment we're going to
- 4 take "and ownership" out. So 39 will read,
- 5 "Secondhand boiler or pressure vessel means a
- 6 boiler or pressure vessel which has changed
- 7 locations since it was last used." Take the word
- 8 "both" and take "and ownership" out.
- 9 Of course, then you're going to get
- the question, "What does 'location' mean?"
- MR. BAUGHMAN: Well, a reinstalled
- boiler says moved from its original setting and
- reinstalled at the same location, so -- without
- change of ownership -- so I'm thinking actually,
- 15 when you go through that process, you're going to
- be looking at a reinstalled boiler instead of a
- 17 secondhand.
- 18 CHAIRMAN MORELOCK: Well, but the
- irony is it's the same form. It doesn't matter if
- 20 it's 37 or --
- MR. BAUGHMAN: I agree.
- 22 Absolutely.
- 23 CHAIRMAN MORELOCK: It's the same
- form. So really, the best way to look at this is,
- 25 to make it read well -- I'm not opposed to

- 1 changing the definition because it's going to boil
- down to the simple fact of whether it goes out and
- goes away or it goes out and it comes back, or it
- 4 comes from somewhere else and then it comes in,
- 5 Sam has to know. The Boiler Unit has to know
- 6 what's coming in and out of the state.
- 7 MR. BAUGHMAN: I agree. It's not
- 8 going to make a whole lot of difference. It's
- 9 just cleaning it up.
- 10 CHAIRMAN MORELOCK: So 37 we'll
- leave alone, and 39 we'll take the word "both" out
- and "and ownership" out. And, like I said, for
- now, just think on that because we're just
- 14 discussing it. But if you have other thoughts,
- 15 we'll change it. If not, it could come back for
- 16 approval that way.
- 17 So we've addressed 37 and 39. So
- 18 Item 3 is page 22. So Rule 22 is going away and
- becoming Rule 11, which is a little irony, but ...
- 20 MR. BAUGHMAN: Which it was
- 21 originally Rule Number -- but originally when you
- 22 brought the code book from 1955, it was Rule 25 or
- 23 27, something like that. So it's been changed
- 24 once before to Rule 22.
- 25 CHAIRMAN MORELOCK: Okay. So this

- is the attendant rule which we've spent the
- 2 morning discussing variances for. The comment is,
- 3 "The open ended, what constitutes checked and what
- 4 defines qualified in the wording where it says
- 5 that attendants for boilers, it has the wording
- 6 that the boiler is being checked by an attendant
- 7 who has been qualified by the owner and its
- 8 operation."
- 9 Boiler Unit's response to that is,
- "Currently the words 'checked' and 'qualified' are
- 11 defined by the owner/user of the vessel. Rules
- should be modified to say being checked pursuant
- 13 to the National Board's recommendations, and
- legislation would be needed to define, clarify,
- and establish qualified, and pursuant to state
- 16 guidelines."
- 17 And so what you see on page 22 under
- 18 11(a), the proposed additional words are in
- orange. And so it would read, "A power boiler
- 20 having a rating of either 5 horsepower or
- 21 50 square feet of heat-absorbing surface or
- greater shall not be operated for periods of
- 23 longer than 20 minutes without being checked
- 24 pursuant to NB's recommendations by an attendant
- 25 who had been qualified by the owner in its

- 1 operation regardless of whether the boiler is
- 2 equipped with automatic feed water regulator, fuel
- or damper regulator, high and low water alarm or
- 4 other form of automatic control."
- 5 MR. BAUGHMAN: Is there a reference
- for that pursuant to NB's recommendations?
- 7 CHAIRMAN MORELOCK: Nothing other
- 8 than part 2.
- 9 MR. BAUGHMAN: Because if we're
- 10 giving references for people to look at ...
- 11 CHAIRMAN MORELOCK: Or -- let's
- see -- part 1 is the installation. Part 2 is
- inspections.
- MR. ROBINSON: Yes.
- 15 CHAIRMAN MORELOCK: So part 1 more
- than part 2. I mean, you're going to have to read
- 17 the whole thing. It's just, you know ...
- 18 MR. BAUGHMAN: I understand. It
- 19 still doesn't exactly go after what we're looking
- for. I would like to hear other thoughts on it.
- MR. JACKSON: What are you looking
- for there, Dave? We're having a little problem
- 23 understanding.
- 24 MR. BAUGHMAN: What I would like is
- 25 that there be a definition of minimum checks that

- 1 need to be made on boilers. In other words, we
- 2 talked today about there was a boiler check sheet,
- and they're going on to see, is the boiler on or
- 4 off? Was there water in the sight glass that was
- 5 below a mark, and -- I don't know, maybe something
- 6 else -- were the lights on in the boiler room? I
- 7 don't know.
- 8 But what I'm getting at is that right
- 9 now -- I've been asked before, "Can we set up a
- 10 video camera and check the boiler? Can we do that
- visually without having to set up or send somebody
- in the boiler room?"
- 13 It says it needs to be checked. So
- 14 what's being checked? And so that's why the
- 15 question is being brought over, because as us in
- the boiler industry, we know that that's totally
- open ended. And if we leave it open ended, if
- somebody comes to me and I say something in
- 19 particular and then they go to Sam and he says
- 20 something else, and -- everybody is on a different
- 21 page. And what we need to do is have some clarity
- and definition as far as what is being checked by
- an operator or an attendant or a guard or whoever
- it may be, and qualifications by the owner. The
- 25 question came up to me before as far as owner and

- 1 that the boiler was part of a leased facility.
- 2 And what actually defines "ownership"?
- 3 And when it comes down to that, that
- 4 again is open ended, especially if it goes to
- 5 court and you're sitting there in front of Bart
- 6 Durham or whoever it may be and they're trying to
- 7 get a definition of who is responsible, who is
- 8 defined as the owner; what defines ownership. And
- 9 so I bring that up because it's been brought up
- 10 before and it's a question in my own mind. It's
- 11 just worthy of discussion.
- 12 CHAIRMAN MORELOCK: Right. But
- what will also get you in trouble with litigation
- is that's why ASME will not define length of
- 15 service. Because when you list in here anything
- that has to be checked and they check that and
- 17 they still have a boiler failure and have property
- 18 damage and loss of life, then you're still going
- 19 to have litigation saying, well, we did all this,
- so it's not our fault that it blew up.
- MR. BAUGHMAN: So if that's the
- 22 case, would we be allowed to -- if a customer
- comes and says, "Dave, can we set up a camera and
- look at that boiler no longer than every
- 25 20 minutes, " how do I answer that?

- 1 MR. JACKSON: One camera will not
- 2 give you the information that you need.
- MR. BAUGHMAN: What information do
- 4 I need?
- 5 MR. JACKSON: What the NBIC
- 6 requires, to do an in-service inspection.
- 7 CHAIRMAN MORELOCK: Well, but an
- 8 in-service inspection and checking the boiler
- 9 every 20 minutes is two different things.
- 10 From those that are in the boiler
- industry, what has to be checked to satisfy the
- 12 20-minute rule? And the best way to do that would
- 13 be to -- if you put a list in there, you could
- 14 put, "Such as noninclusive" -- whatever, and then
- 15 list what you want in there. So that way the
- reader understands that this is some suggestions
- 17 that should be checked, but this is by all means
- 18 not the end-all list of what has to be done.
- MR. BAUGHMAN: That's nothing
- 20 presently.
- 21 CHAIRMAN MORELOCK: Right.
- MR. BAUGHMAN: It's just nothing.
- 23 And the question has been brought up, "Can I open
- the door and just say the boiler is there?"
- There's no definition of it, and that's where it

- 1 needs to have -- not inclusive, I agree -- but
- there needs to be at least some direction of
- 3 checking.
- 4 The same thing with the cameras. All
- 5 these variance rules and all of that being brought
- 6 up and the cost involved with them, and then the
- 7 question was, "Can I set up a video camera and
- 8 have it there at my desk?" And how do I answer
- 9 that? Because they're checking the boiler but
- there's no definition on what's being checked.
- 11 And if we define some things that have to be
- 12 checked, then we know that the boiler is actually
- being looked at. So that's why I brought it up
- 14 for the discussion.
- 15 CHAIRMAN MORELOCK: Well, we just
- 16 need some suggested words.
- 17 MR. ROBINSON: I think that would
- 18 fulfill -- make a suggestion as far as the minimal
- 19 suggested checks.
- 20 MR. JACKSON: I tell you, when I do
- 21 the ASME reviews and they put them laundry lists
- in their manuals, I love them. I can bust their
- 23 chops every time.
- MR. BAUGHMAN: Well, from you guys
- in the industry, what do you think? You've got

- three 1000-horse boilers. What do you think needs
- 2 to be checked on the boilers?
- MR. ENG: I'm not a boiler person,
- 4 but I have some minor background in operating a
- 5 boiler system. I'm a chemical engineer by trade,
- 6 so I'm not even a mechanical guy. I apologize for
- 7 that early on, obviously. We intend to have three
- 8 1000-horse power boilers at Walker sometime next
- 9 year. We have three because two will be
- 10 operational. The third one will be on standby,
- 11 whatever you want to call it. One will be on full
- fire and the other one will be on "on demand."
- 13 That's the way we intend to operate those three
- 14 boilers.
- In my prior experience, what we do is
- that we will check whatever frequency separate
- from the requirements are, blowdown -- surface
- 18 blowdown -- temperatures of the blowdown, the
- 19 level switch visual. And that is probably once
- 20 every hour if not more frequent because of
- 21 regulation by New Jersey.
- In Tennessee it's somewhat different.
- 23 I hear the 20-minute rule all the time. For me,
- it's a difficult way to comply with an operation
- 25 because we have so much interlocks and safety

- devices in place already. One from the design,
- 2 two from the manufacturer, three from our DCS, and
- 3 four from other peripheral underwriter
- 4 requirements. So we have backup after backup
- 5 after backup.
- 6 The camera comment, perhaps it's
- 7 nothing new for us. We intend to have some type
- 8 of monitoring more than the DCS monitoring system
- 9 that we have already.
- 10 So that's sort of my thinking of how
- we're going to operate the facility independent of
- the 20-minute requirement. Whatever it is, we'll
- 13 comply, but that may not be enough for us.
- MR. BAUGHMAN: But what you were
- 15 saying was blow-downs, levels -- what I'm thinking
- is a water level. If it's a hot-water boiler it
- 17 won't, but if the boiler is operating, maybe a
- 18 stack temperature.
- MR. ENG: Which had the make-up
- order, the deaerator, the pumps, if they're
- swinging back and forth or not, the sound, the
- 22 sights, everything that we feel comfortable to
- ensure that not only is it safe, but is it
- 24 efficient?
- MR. BAUGHMAN: Well, what I'm --

- and the reason I brought that up is it's specific
- 2 to your installation. You go to the next
- installation, and they've got low-pressure steam
- 4 boilers, and they've got a 50-horse low-pressure
- 5 steam, and they've got a hot-water boiler. And so
- 6 none of those are particularly applicable to that
- 7 1000-horse high-pressure steam boiler, fire 2,
- 8 water 2. I mean it's not a one size fits all.
- 9 So what I would like to see developed
- 10 is some checklist that mandates that the boiler is
- 11 being checked, and some specific checks so that it
- does get away from the camera. It does get away
- from just opening the door and saying, "Yes, I
- 14 looked inside of it."
- 15 I want to have some criteria that the
- 16 boiler is actually being checked in some form or
- fashion, whatever that may me.
- 18 MR. ROBINSON: Mr. Devers, what
- 19 checks do you make on a daily basis?
- 20 MR. DEVERS: Just mainly water
- 21 levels, temperatures of the boilers, just overall
- 22 visual checks.
- MR. ENG: We do walk-throughs,
- 24 chemical analysis, just like he said, water
- 25 treatments. Our DCS system is predominantly

- 1 monitoring 24/7, scan rates or whatever the scan
- 2 rate that we choose.
- 3 CHAIRMAN MORELOCK: Well, but what
- 4 if you -- because see, you're still -- you could
- 5 paint yourself in a corner based on what type of
- 6 boiler it is or what service it's in.
- 7 What if you said something like, "Per
- 8 suggested guidelines in ASME Section VI and VII
- 9 for the care and operation of power boilers, " or
- 10 whatever. There are some guidance documents out
- 11 there. They're not mandatory.
- 12 MS. JEFFERSON: And I think that's
- 13 better. That's probably better information for
- our website. As far as putting it in our rules,
- 15 I'm kind of skeptical. And that's why we included
- that information here, to just, you know, let
- 17 everybody know that legislation is needed for
- 18 this. We can't just create these type of rules
- 19 that the legislature hasn't spoken about.
- 20 CHAIRMAN MORELOCK: Right.
- MS. JEFFERSON: But as far as
- including suggestions on our website, I think we
- 23 can do that. We can come up with a checklist,
- 24 suggested checklist, and start putting information
- 25 together, compiling it, and then we can modify it

- 1 as needed. But it can be a suggestion, a
- 2 recommendation. We can't mandate or require
- 3 people to do this.
- 4 MR. ROBINSON: You bring up a very
- 5 good point. Suggestions are also included in
- 6 CSD-1 in the back.
- 7 MR. BAUGHMAN: It is. I was
- 8 thinking of that when you made mention of the
- 9 ASME --
- 10 MR. ROBINSON: In their daily,
- 11 annual, weekly --
- MR. BAUGHMAN: Absolutely.
- MR. ROBINSON: That's a start.
- 14 Very good.
- MR. BAUGHMAN: Uh-huh.
- MR. JACKSON: Mr. Heater was
- 17 telling me that this morning at Oak Ridge, their
- inspection criteria depends upon which building is
- in charge of --
- 20 CHAIRMAN MORELOCK: Right.
- MR. JACKSON: So there, again, it
- 22 comes into what you've got.
- "I want to check this."
- "Well, I don't think you need to
- 25 check it. She can check hers if she wants to."

- 1 So when you start getting down to --
- 2 like Kim was saying -- getting down to doing a
- 3 list and so on and so forth, you're asking for
- 4 problems.
- 5 MR. BAUGHMAN: The list is out
- 6 there in a suggested form. And I think if we make
- 7 reference to that --
- 8 MR. ROBINSON: Yeah, I think it
- 9 would be worthwhile to review 61 and maybe add
- 10 that in addition to.
- 11 CHAIRMAN MORELOCK: Okay. So let's
- just put we're going to work on this item some
- 13 more. And if you have suggestions --
- DR. CANONICO: You might want to
- 15 look at Section VII.
- MR. JACKSON: Recommended rules?
- 17 CHAIRMAN MORELOCK: Yeah.
- DR. CANONICO: I don't know how up
- 19 to date it is, but ...
- 20 MR. BAUGHMAN: That gets down to
- 21 the owner part of that equation also.
- 22 CHAIRMAN MORELOCK: So "In some
- 23 installations, the owner cannot be identified.
- Owner of what? The building or facility, the
- 25 boiler?"

- 1 Okay. So ...
- 2 MR. BAUGHMAN: When you read the
- 3 Boiler Unit response --
- 4 CHAIRMAN MORELOCK: But isn't
- 5 "owner/user" kind of a pretty well-understood
- 6 term? I don't think there's a lot of vagueness in
- 7 that.
- 8 MR. BAUGHMAN: It doesn't say in
- 9 the attendance -- under Rule 22, it doesn't say
- 10 "owner" or "user." It just says "owner," does it
- 11 not? It says that the boiler is being checked by
- an attendant who has been qualified by the owner,
- 13 not by the owner/user but just by the owner.
- 14 And so I would put down that it would
- be the owner and then add "user" rather than just
- leaving it as the owner of it. Because the owner
- of the boiler, to me, was something that could be
- 18 a bit vague also. To me, user of the boiler is
- 19 who it should be qualified by more so than even
- the owner.
- 21 CHAIRMAN MORELOCK: Okay. So
- owner, slash, user?
- 23 MR. BAUGHMAN: That would be my
- thought.
- 25 CHAIRMAN MORELOCK: Okay. We'll

- 1 make that change.
- 2 MR. BAUGHMAN: If that makes sense
- 3 to everybody else.
- 4 CHAIRMAN MORELOCK: Okay. "We
- 5 require operational log sheets for historic boiler
- 6 be maintained, but have no such requirement listed
- 7 for the operation of a power boiler under this
- 8 rule, unless it falls under the attendant rule
- 9 variance. It should be a requirement regardless
- of whether a variance is in place or not."
- 11 Boiler Unit response is, "The
- 12 operation of a power boiler is automated, and an
- automated report can be generated to show that an
- 14 attendant checked every 20 minutes. Therefore,
- there is no need for a separate log."
- 16 Comments on that?
- MR. BAUGHMAN: I don't know if you
- 18 want to hear my comment on that.
- MR. JACKSON: Do you want to hear
- 20 mine?
- 21 CHAIRMAN MORELOCK: Yes.
- MR. JACKSON: No, go ahead. I'm
- waiting to see why he wants one.
- MR. BAUGHMAN: As far as a log
- sheet? Well, there's liability in operating a

- 1 boiler. And because you've got a liability,
- 2 you've got to have accountability for that
- 3 liability. And even though a log sheet can be
- 4 fudged, the log sheet is the one piece of
- 5 accountability that shows that the boiler has had
- 6 checks done to it.
- 7 We require those checks for both
- 8 historic boilers and we require those to be
- 9 logged. We require them if you have a boiler
- 10 variance to where instead of checking the boiler
- 11 every 20 minutes, you only check it once every
- 12 four hours. We don't require it for the standard,
- everyday, normal operation. And the response is
- 14 that the boiler is automated and an automated
- report could be generated. And I don't quite
- 16 understand that response.
- So in my mind, the only
- 18 accountability is a log sheet. I don't quite
- 19 understand the response of an automated report can
- 20 be generated that shows an attendant checked it
- 21 every 20 minutes, so I ...
- MR. JACKSON: You've tied a
- 23 variance in with operation without a variance by
- 24 this question.
- MR. BAUGHMAN: Yes.

- 1 MR. JACKSON: And they're two
- 2 separate issues.
- 3 MR. BAUGHMAN: They are. One
- 4 requires a log sheet and one does not.
- 5 MR. JACKSON: That's correct.
- 6 MR. BAUGHMAN: You're still
- 7 operating the same boiler, so you've got one
- 8 boiler, two different types of operation. One
- 9 under Rule 22, one under a variance. One has to
- 10 be checked every four hours and logged, one has to
- 11 be checked with criteria that's going to be
- 12 suggested on what has to be checked and doesn't
- have to be logged.
- 14 My question is why does it not have
- to be logged and still has the same liabilities in
- operation? Nothing has changed. Steam pressure
- 17 hasn't changed. Nothing has changed in its
- 18 operation. And we have no mandate to record that
- 19 that boiler is being checked in its operation. We
- 20 don't require it ever. There's nothing that
- 21 requires it.
- MR. JACKSON: There again, you're
- 23 touching on Kim's comment. We don't want to get
- into some stuff, giving them a list of what you're
- 25 going to do and so on and so forth.

- 1 MR. BAUGHMAN: I'm not asking for
- 2 that.
- 3 MR. JACKSON: No. But if you have
- a list or a sheet, boiler log or what-have-you
- 5 log --
- 6 MR. BAUGHMAN: We require it for
- 7 the variance.
- 8 MR. JACKSON: Altogether different
- 9 story.
- 10 MR. BAUGHMAN: And explain quite
- 11 how.
- 12 MR. JACKSON: Because there is no
- 13 attendant necessary. Everything is automated in
- 14 that aspect.
- MR. BAUGHMAN: Okay.
- MR. JACKSON: You've got a screen
- somewhere that they can pull up anything they want
- 18 on them boilers.
- 19 MR. ROBINSON: I think if we table
- this one, it would be wise only because it runs
- 21 hand in hand with the requirements for being
- checked.
- MR. JACKSON: Yes.
- MR. ROBINSON: So once we establish
- 25 the counter measures or suggested checks, once we

- 1 establish that, if we decide to, then we can move
- 2 forward and create what we want checked.
- MR. BAUGHMAN: I agree. What do
- 4 you think about common sense, though, on -- what's
- 5 the thought on a boiler being logged? What would
- 6 your thoughts be on a log sheet needing to be --
- 7 MR. ROBINSON: I'm pro-log. But,
- 8 also, I understand some of the logistics that may
- 9 be involved. So I'm a little bit cautious on how
- 10 I put it out there.
- MR. BAUGHMAN: And I'm not
- 12 necessarily saying I want it logged every
- 13 20 minutes.
- 14 MR. ROBINSON: Right. No. No.
- 15 But you asked it. I'm saying.
- MR. BAUGHMAN: Sure.
- 17 MR. ROBINSON: So realistically,
- 18 because of that, I know that in 1949 when these
- 19 guys got together and created this Board, that in
- their infinite wisdom, they made a suggestion.
- 21 They said, "Wow. If we do that every 20 minutes,
- somebody is going to be running back and forth in
- 23 here. And every Ma and Pa station is going to
- have to sacrifice. And it's not either going to
- 25 happen" -- so because of that, let's, again, table

- 1 it, go with the suggestions, make a determination
- 2 based on what we find with CSD-1, with NBIC per
- 3 certain rules, and move from that.
- 4 MS. RHONE: And I had a question,
- 5 too. Where is the law going to be maintained?
- 6 MR. ROBINSON: It would be at that
- 7 state -- well, it would be on the site. In other
- 8 words, the inspector at this point, if he comes
- 9 in, he would do just as Neil does, "Show me your
- 10 log."
- 11 MS. RHONE: And is this
- information -- is he going to pull this up from
- 13 the computer?
- 14 MR. ROBINSON: No. He would have a
- 15 documented piece of evidence, or he could have a
- 16 computer.
- MR. JACKSON: They're fastly going
- 18 to the computer.
- MS. RHONE: Because I was going to
- say, because if it's a computer, then it's
- 21 still -- they push the button and there it is.
- MR. ROBINSON: There it is, yeah.
- 23 But most likely, it's going to be like a check
- sheet, and you figure somebody is going to go in
- there and, in today's word, earlier, pencil whip

- 1 it if that's the case, because, again, you look at
- the logistics and back to Mr. Beard. He made the
- 3 comment that, you know, some legislation may not
- 4 be feasible at this time. So we've got to look at
- 5 it optimistically, in my opinion.
- 6 MR. BAUGHMAN: And it's a good
- 7 discussion to bring it up. I mean it's one of
- 8 those things that has --
- 9 MR. JACKSON: Well, I agree with
- 10 you. It would be beautiful if they did. I mean,
- it sure would be nice if everybody made them log
- out and we had a nice laundry list to it and all
- 13 of that.
- 14 MS. RHONE: But if it's next to the
- 15 equipment and something happens, there goes the
- 16 log.
- 17 MR. JACKSON: Yeah, it burned up.
- 18 MR. BAUGHMAN: It's not a matter of
- if. It's a matter of when there's going to be
- 20 something come up. And if we're proactive, if --
- 21 that's why we're here, is safety. That's the
- 22 whole point of why we're all sitting here. And if
- 23 we can do something that enhances that, then we're
- doing our due diligence. But yeah, thanks.
- 25 CHAIRMAN MORELOCK: Okay. Ladies

- 1 and gentlemen, it's almost 1:00. So this is a
- discussion item. We have no other business to
- 3 take care of. Unless there's objection, we'll
- 4 take Eugene's comments in the December meeting.
- 5 Continue to read through the draft,
- 6 and we will continue this discussion in December.
- 7 And we'll move the Boiler Operator
- 8 Legislation and an update on the fall conference
- 9 to the December agenda.
- I know Dr. Canonico has got a wife
- 11 that would like to be picked up at the hotel and
- 12 taken home.
- DR. CANONICO: I've got a sick car.
- 14 CHAIRMAN MORELOCK: And he's got a
- 15 sick car, and so there's no rule cases or
- interpretations. Our next Board meeting will be
- Wednesday, December the 3rd here at the Department
- 18 of Labor and Workforce Development in the TOSHA
- 19 Room at 9:00 a.m.
- 20 And I hope everybody has a happy
- 21 Halloween and a happy Thanksqiving before I see
- 22 you in December.
- 23 And with that, do I have a motion to
- 24 adjourn?
- MR. ROBINSON: So made.

```
Page 169
 1
                      CHAIRMAN MORELOCK: Everybody vote
 2
     by standing up.
                    (Affirmative response.)
 3
 4
5
                                   END OF THE PROCEEDINGS.
 6
7
 8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
```

A	action 20:14 95:18	advocate 63:9	55:5 55:5 59:15	<b>alone</b> 147:11
	170:16	<b>affect</b> 12:22 18:20	60:23 61:4 65:16	along 19:25 20:8
abbreviation 65:10	actual 15:20 68:12	affirmative 9:20	67:23 67:25 149:3	60:25 139:1
65:21	actually 11:19 13:1	42:10 83:19 94:12	alarms 46:5 51:12	already 74:22 75:14
ability 86:21	26:8 35:5 48:6	169:3	51:13 51:16 61:8	83:8 120:20 124:14
able 15:20 28:25	49:25 49:25 54:21	after 15:3 24:1 82:8	66:10 68:9 85:25	124:17 125:5 137:1
57:23 62:16	60:3 62:21 65:11	149:19 155:4 155:5		
above 24:21 56:11	90:24 95:11 101:20		10:1 11:14 11:15	alteration 102:2
73:4 107:2 112:20	110:10 110:23	<b>again</b> 20:12 22:9	17:13 18:17 19:8	118:8 132:14
112:21 117:2 118:2		27:15 55:13 56:11	20:14 20:15 28:8	alterations 111:16
142:13	125:10 131:4	70:6 80:23 90:4	28:8 42:9 42:9	117:4 117:10
absence 62:24	132:17 146:14	92:6 99:15 106:5	42:19 51:16 56:8	117:16 138:6
absolutely 58:6	151:2 153:12	119:16 151:4	56:17 56:17 59:5	altogether 164:8
67:22 101:17 102:6		158:21 163:22	59:5 60:4 60:16	always 13:8 37:23
102:19 103:7	add 8:14 8:21 8:25	165:25 167:1	62:22 66:3 71:5	47:10 53:22 54:1
146:22 158:12	9:3 9:6 9:8 9:10	against 36:25 88:5	71:9 72:4 72:8	88:18 141:18
absorbing 148:21	34:14 81:18 93:18	age 120:22	73:25 74:14 76:18	145:24
abstention 94:17	99:19 99:25 100:18	g	77:6 79:6 79:20	amended 9:15
94:23 94:24	105:25 159:9	<b>agency</b> 19:11 110:1	79:24 81:13 82:2	amendment 42:5
abstentions 9:23	160:15	117:6	82:5 82:6 82:20	<b>among</b> 59:11
42:13 83:22 94:15	added 74:2 93:8	<b>agenda</b> 3:10 8:11	83:18 84:17 86:15	analysis 122:9
accept 9:15 101:6	109:18 109:19	8:12 8:14 9:3 9:6	88:9 90:6 91:17	156:24
108:10	138:4	9:11 9:15 10:2	93:21 94:10 95:3	annotated 118:9
acceptable 96:1	adding 78:18 100:21	12.10 17.0 17.2	95:8 95:9 95:12	announce 7:12
98:15	101:23	21:10 42:23 84:9	96:22 102:8 102:9	announcements 3:9
acceptance 47:12	addition 42:1 101:11	75.1.100.7	103:17 106:10 106:21 107:25	7:3 8:7
78:11 82:14 87:25	159:10	<b>ago</b> 55:14 76:21	100:21 107:25	<b>annual</b> 30:2 42:2
access 32:19 46:17	additional 87:15	104:17 124:4	111:16 113:7 115:2	87:7 91:17 91:23
99:8 101:13	91:16 118:4 120:11	100.101.0.2	115:6 116:6 117:3	138:11
accidentally 46:20	148:18	<b>agree</b> 90:12 108:4	119:21 120:4	annually 67:15
accomplish 103:2	additions 83:9	114:5 123:20	121:15 122:3 122:8	another 14:24 20:25
accord 120:17	address 16:16 106:25		124:25 126:14	25:21 27:21 29:7
accordance 117:11	107:18 126:24	147:7 153:1 165:3	130:6 130:21 135:6	33:1 58:9 60:11
118:9	143:23	167:9	135:7 136:11	03:19 64:4 /0:23
according 24:14 25:1		agreeable 145:22	129.21 120.22	74:3 74:6 108:9
88:4 97:25 98:9	adjourn 168:24	<b>agreed</b> 95:16 127:25	141:17 142:25	109:12 111:21
132:23 137:12	adjournment 3:24	145:18	144:16 151:19	128:21 128:24
141:20	adjust 41:3 63:18	ahead 36:5 86:12	152:17 152:18	135:1 135:9
accountability 162:2		100:19 101:10	153:4 153:5 154:23	<b>answer</b> 26:19 41:9
162:5 162:18	administration 16:3		156.8 167.12	151:25 153:8
accreditation 144:2	administrator 2:18	air 50:3 98:23 98:25	167:22	answered 17:12
accredited 113:10	5:1 5:3	99:1 139:16	allen 6:6	80:15
113:15 114:19	adopt 135:12	ajax 102:15	<b>allied</b> 2:12 4:24	answers 17:14
117:6	<b>adoption</b> 3:10 8:11	alarm 28:1 30:16	allow 33:19 110:17	<b>anybody</b> 6:25 74:24
accumulator 26:6	9:10	33:23 35:2 45:6	120:22	130:13 143:14
accurate 33:14 170:7		45:8 45:10 45:13	allowable 110.22	146:1
acronym 65:21	advantage 79:23	46:4 46:8 46:8 46:9	124:15 124:23	anymore 123:17
117:12 117:18	advertise 22:11	46:11 51:21 51:23	126:13 129:23	anyone 139:23
across 34:17 49:2	advice 68:22 70:1	51:25 52:6 52:10	allowed 44:23 151:23	anything 8:25 13:11
49:8 103:23	advised 15:13	54:9 54:15 54:18	almost 60:9 168:1	18:25 73:15 151:15

164:17	area 33:11 112:10	atmosphere 27:1	63:23 78:4 87:3	37:22 38:1 38:4
anywhere 123:16	120:23 120:25	atmospheric 77:14	109:11	38:7 47:8 47:21
apologize 10:10 25:4		94:1	aware 68:8	47:24 48:7 48:13
58:12 154:6	aren 13:24 81:2	attached 12:24	away 7:10 7:19 64:4	48:25 49:14 49:21
apparently 60:12	arena 36:24	attend 18:9	71:6 85:19 85:20	49:24 50:6 50:12
appear 14:14	argument 121:4	attendance 20:20	121:3 129:13 147:3	50:16 50:21 50:24
appearance 22:24	144:2	35:20 103:3 160:9	l l	51:3 51:15 51:19
appearances 2:1	around 18:21 33:21	attendant 21:6 21:23	l	51:24 52:4 61:14
appears 63:10 117:2		41:19 41:21 43:2	aye 94:11	61:18 61:21 62:8
118:2	arrangement 22:23	44:19 46:12 52:7		62:12 63:3 63:7
appendices 81:6	arthor 6:6 6:6	53:18 53:19 53:21	В	64:7 64:14 73:10
appendix 65:4 65:5	ask 20:3 20:4 33:17	53:23 54:1 54:8	<b>b1</b> 49:20	74:17 75:12 75:19
68:16 69:8 74:18		55:2 55:8 55:15	<b>b2</b> 50:11	75:22 76:1 76:4
	33:25 88:24 96:12	55:17 55:21 56:14	back 8:12 29:22	76:9 76:24 77:6
77:21 81:5 87:12 88:22 92:22 124:8	135:25	56:15 57:17 57:19		77:10 77:16 77:19
1	<b>asked</b> 39:10 76:23	58:3 58:11 58:25	55:13 58:17 58:25	77:23 78:2 84:19
<b>applause</b> 12:9	82:20 97:18 150:9	59:4 59:19 60:1	61:16 63:2 70:5	84:22 88:11 88:21
apples 71:12 71:12	165:15	60:8 60:11 62:17	74:19 84:8 98:24	88:24 89:5 89:8
applicable 28:7	asking 49:15 66:24	67:20 148:1 148:6	99:2 100:5 102:4	89:11 89:14 89:20
137:13 137:14	97:8 112:25 122:6	148:24 150:23	108:24 111:8	89:23 90:3 90:12
156:6	159:3 164:1	160:12 161:8	112:24 115:5	90:15 90:20 91:3
applicant 113:5	asme 18:5 21:5 22:3	161:14 162:20	121:20 123:10	91:7 93:24 94:3
119:13	22:17 23:4 25:6	164:13	124:2 124:21 127:7	94:16 96:15 98:16
application 26:4	39:11 100:13		131:22 138:12	99:22 102:10
110:12 123:4		attendants 46:25 57:2 61:1 61:2	142:16 142:18	102:19 103:7
145:11	125:17 137:14	61:20 62:7 62:19	144:13 147:3	103:10 104:21
applications 105:16	151:14 153:21	64:10 86:3 86:9	147:15 155:21	106:16 106:20
<b>applied</b> 26:5 110:6	157:8 158:9	92:25 93:9 148:5	158:6 165:22 167:2	
124:17 145:11	aspect 41:20 95:21	attendees 8:2	background 154:4	131:22 133:6
applies 120:1 123:14		attending 61:15	backup 34:19 155:4	134:15 135:17
<b>apply</b> 17:9 113:4	aspects 121:5	<b>attention</b> 13:9 89:21	ı - ı	135:23 136:5
applying 80:5	<b>assemble</b> 95:9	89:23 109:7	<b>bad</b> 46:6	136:10 136:20
appreciate 11:14	assessed 97:25 98:8	audience 99:24	bag 135:24 139:21	137:2 137:20
11:17 42:19 95:1	99:20	audit 13:4 13:15	bart 151:5	138:10 138:14
appreciation 12:4	asset 5:9 85:4	audit 13.4 13.13 audited 68:23	based 13:20 37:12	138:17 138:22
approach 13:17	assigned 90:17	audits 13:12	47:11 47:11 157:5	139:1 140:4 140:16
appropriate 22:17	assigns 18:15		166:2	140:19 141:4 141:9
23:3 23:4 23:8	assistance 103:13	author 112:16	<b>basically</b> 13:15 17:15	141:19 142:6 142:9
28:22	assistant 2:16 4:18		17:18 96:5 99:19	142:19 142:24
appropriately 41:6	5:2	119:14 144:3	115:23 120:1	143:2 143:10
approval 105:18	associate 113:16	authorized 109:25	<b>, ,</b> ,_ , ,,_ ,,	144:17 144:23
147:16	114:16 114:20	117:6 120:10 132:5	156:19	145:2 145:8 145:12
<b>approve</b> 23:15 41:18		133:2	baughman 2:11 4:23	145:25 146:11
47:10 87:24	assume 13:7 125:14	authorizing 117:16	4:23 9:18 23:21	146:21 147:7
<b>approved</b> 15:6 16:12		<b>automated</b> 161:12	24:3 24:14 24:20	147:20 149:5 149:9
40:16 42:9 42:17	assumed 34:13	161:13 162:14	24:24 25:7 25:18	149:18 149:24
50:5 68:9 106:2	assuming 112:1	162:14 162:19	26:3 26:11 30:6	151:21 152:3
111:16 111:17	assumption 34:14	164:13		152:19 152:22
approximately 29:4	34:23 133:14	automatic 52:9 149:	35:3 35:13 36:7	153:24 155:14
44:1 45:17 85:18	astutely 130:12	149:4	07 5 07 11 07 16	155:25 158:7
arduous 111:18	atlantic 91:4	<b>available</b> 14:13 54:1	37.3 37.11 37.10	158:12 158:15

			т т	
159:5 159:20 160:2	150:9 150:25	66:19 66:24 67:3	10:13 10:15 11:16	46:10 46:12 46:14
160:8 160:23 161:2		67:22 68:2 71:5	12:6 12:21 12:22	46:16 46:17 46:17
161:17 161:24	170:8	71:9 71:13 71:18	12:23 13:1 13:10	46:20 46:22 46:24
162:25 163:3 163:6		72:8 72:11 72:19	13:16 13:23 14:4	46:25 48:19 48:20
164:1 164:6 164:10	C	75:1 75:3 76:10	14:7 14:12 14:20	48:21 49:5 49:7
164:15 165:3	beginning 20:4 22:20		15:14 15:21 15:25	49:8 49:20 49:20
165:11 165:16	39:11 47:2 65:25	84:4	16:19 17:9 17:13	49:23 50:4 50:10
167:6 167:18	71:20	berkebile 5:8 5:8	17:23 18:8 18:12	50:17 50:18 50:25
<b>bc92</b> 21:1 31:4 37:7	<b>behalf</b> 11:8 11:11	85:3 85:3 86:11	18:23 20:2 20:18	51:6 51:13 51:14
39:5	11:16	88:14 89:18 91:1	21:1 21:16 35:15	51:22 52:1 52:3
<b>bead</b> 139:12	<b>behind</b> 26:20	91:5 91:24 92:3	39:4 39:6 67:24	52:7 52:18 53:5
beard 5:21 5:21	<b>beiling</b> 1:22 4:15	92:16 92:19 93:2	82:11 87:18 95:23	53:13 53:13 53:14
12:16 12:20 16:23	170:4 170:24	93:7 93:13 93:18	96:3 100:13 103:24	53:18 53:19 53:20
17:6 18:14 18:19	being 14:13 25:21	93:22 94:25	105:8 105:20	53:23 54:1 54:20
19:4 167:2	26:5 29:3 40:11	beside 96:24	105:21 106:2 108:5	54:21 55:2 55:7
beat 61:25	46:12 47:15 59:4	best 146:24 152:12	110:24 111:17	55:8 55:11 55:12
beautiful 167:10	62:2 68:23 73:13	bet 78:2	112:19 114:7 116:8	55:15 55:17 55:21
beauty 85:9	75:15 98:6 101:18	better 31:2 31:25	117:18 119:16	55:22 55:24 56:4
becomes 32:11 62:15		157:13 157:13	120:13 127:14	56:13 56:14 56:15
100:6 111:3 141:7	114:25 121:7	<b>between</b> 9:10 57:24	129:20 129:21	56:18 57:9 57:17
becoming 103:20	129:14 129:19	59:17 60:7 66:20	130:18 132:11	57:19 57:20 58:3
147:19	141:13 141:17	<b>beyond</b> 28:6 56:11	132:22 133:24	58:4 58:6 58:10
been 10:9 10:13	144:18 148:6	137:6	134:25 135:15	58:19 58:25 59:4
10:18 10:24 13:6	148:12 148:23	<b>bhp</b> 40:18	137:15 139:5	59:18 59:19 59:25
31:8 32:7 37:14	150:14 150:15	biased 31:1	148:13 165:19	60:1 60:3 60:4 60:8
37:21 44:3 44:12	150:22 153:5	big 9:4 135:22	168:16 170:9	60:11 60:16 60:23
48:15 61:14 61:16	153:10 153:13	143:23	<b>  bob</b> 6:17 7:18 7:19	60:25 61:1 61:15
66:18 66:21 67:6	156:11 156:16	bigger 61:7	<b>body</b> 29:10 29:12	62:1 62:18 62:19
68:18 69:22 72:16	160:11 163:19	<b>bills</b> 18:20	29:17 109:17	62:20 62:25 63:1
73:23 74:20 75:6	164:21 165:5	bit 7:8 9:5 30:25	<b>  boil</b> 147:1	63:4 63:6 64:3
75:10 75:13 75:13	<b>believe</b> 14:2 16:14	81:25 82:5 107:12	<b>boiler</b> 1:2 1:9 2:8	64:10 64:22 67:12
76:11 76:20 79:6	17:7 31:2 52:15	114:15 130:2	2:12 2:16 3:18 3:21	67:20 67:20 68:17
80:10 80:15 87:11	60:15 103:18	160:18 165:9	4:3 4:4 4:18 4:24	68:17 68:19 68:24
90:24 91:8 96:19	115:14 131:7 134:5	<b>blain</b> 5:18 5:18	6:13 11:12 11:22	69:2 69:11 69:17
103:23 117:12	<b>below</b> 73:4 73:5	<b>blank</b> 74:21 90:13	12:2 12:6 15:2	69:23 70:17 70:22
119:16 121:16	125:21 150:5	<b>bleed</b> 131:9	18:21 19:16 20:23	71:7 71:17 71:21
124:17 133:14	<b>benefit</b> 82:13 82:15	<b>blew</b> 151:20	21:6 21:22 22:3	71:22 71:23 73:3 73:3 74:1 74:3 74:3
141:5 141:13	<b>bennett</b> 2:21 4:19	<b>blob</b> 143:23	22:19 24:16 24:25	74:11 74:13 74:18
147:23 148:7	4:19 7:7	<b>blood</b> 170:16	25:4 25:8 26:1 27:3	78:19 78:20 78:22
148:25 150:9 151:9		blow 71:25 73:17	27:7 28:16 28:17	79:2 80:7 81:6 81:7
152:23 160:12	43:14 43:17 48:5	73:20 74:4 74:12	31:23 31:24 35:10	85:17 85:25 86:3
<b>before</b> 7:23 9:7 14:15		155:15	35:14 35:19 36:1 37:4 37:19 39:8	86:9 87:13 87:14
14:21 14:24 15:5	52:21 52:23 54:4	blowdown 154:17	39:14 40:2 40:14	87:14 87:14 87:15
15:21 15:24 17:1	54:22 54:25 55:3	154:18 154:18		87:15 87:16 88:12
17:1 20:6 47:5	56:6 56:10 57:2	<b>blower</b> 104:15	41:21 41:23 43:21 44:4 44:9 44:12	88:12 88:12 88:21
75:14 77:1 88:18	57:6 59:12 60:18	<b>board</b> 1:2 1:9 2:5 2:8	44:16 44:18 44:19	88:25 89:2 89:9
96:22 105:8 105:20		2:11 2:14 2:22 3:21		89:15 90:18 92:24
107:25 121:21	62:11 62:22 63:13	4:3 4:4 4:8 4:20	45:5 45:7 45:9	93:9 93:24 97:13
124:1 135:14 140:8		6:21 6:23 7:10 7:17	45:16 45:18 45:20	97:21 98:2 98:10
140:12 147:24	65:24 66:10 66:14	9:9 10:8 10:11	45:25 46:1 46:6	99:5 100:4 102:15
			13.23 10.1 10.0	

102.17 102.25	04.14 04.15 05.10	huidaastana 5,24 6,1		120.20 121.2
102:17 103:25	84:14 84:15 85:12	<b>bridgestone</b> 5:24 6:1 <b>brief</b> 7:14 39:2		120:20 121:2
105:15 105:18 105:22 106:1 106:2	85:13 86:1 86:2 86:17 86:19 87:10			121:19 121:22 122:3 122:7 122:11
105:22 106:1 106:2 106:4 106:2 107:4		<b>bring</b> 13:18 20:13	calculation 122:4	122:3 122:7 122:11
		94:4 107:19 110:22	caldwell 10:8	
107:11 107:16	100:2 101:13	124:21 135:18	<b>calendar</b> 15:9 15:11	123:15 123:22
108:19 109:2 109:4		142:16 142:18	<b>call</b> 3:8 33:8 37:2	123:25 124:6
109:24 112:13	102:22 102:23	142:22 151:9 158:4	37:3 42:8 44:25	124:14 124:20
112:20 113:22	105:13 106:22	167:7	55:8 62:23 63:1	125:20 126:1 126:5
113:24 114:1	107:12 108:23	bringing 19:11	63:17 64:2 79:24	126:11 126:18
115:21 117:1 117:8		brooks 88:25	80:25 83:18 94:10	126:25 127:4 127:6
118:1 120:8 122:2	113:19 114:1 115:6	brothermood 0.12	101:19 105:4 112:2	128:16 129:8
127:13 132:3 132:8		brought 61:24	124:20 124:22	129:16 129:24
132:11 132:12	128:3 132:6 140:10	133.17 172.0	129:2 139:21	130:5 130:24 131:2
132:13 132:16	144:18 148:5 150:1	147:22 150:15	141:18 154:11	131:14 131:19
132:21 133:2 133:3		151:9 152:23 153:5	<b>called</b> 37:19 68:25	159:14 159:18
133:3 133:9 133:17		153:13 156:1	82:19	168:10 168:13
133:25 134:2	156:21 157:9 162:8	DIOW 2.7	calling 4:3	capacity 28:21
134:19 137:8 138:2		<b>bsp</b> 70:9 70:14 70:16	came 10:10 10:11	captured 91:19
140:22 140:25	book 66:4 68:6 83:5	70:20	35:22 50:6 50:8	car 4:8 168:13
141:22 141:23	86:18 137:22	btus 28:18 28:18	75:5 104:17 104:20	168:15
142:1 142:2 143:20		28:19 28:20	135:11 150:25	carbon 125:22
144:13 144:19	<b>books</b> 80:9 126:20	<b>build</b> 61:7 144:12	camera 150:10	<b>card</b> 32:17
145:1 145:13 146:5		<b>building</b> 3:22 8:1 8:3		care 5:9 49:12 85:4
146:6 146:12	23:1 29:24 51:9	8:4 8:5 65:14 65:16		85:9 100:23 115:7
146:16 147:5 148:6		144:12 144:12	cameras 153:4	131:20 157:9 168:3
148:9 148:19 149:1	0 < 20 0 < 24 100 14			
	86:20 96:24 100:13	144:15 158:18		carlene 2:21 4:19 7:4
150:2 150:3 150:6	126:12 131:17	144:15 158:18 159:24	campbell 8:18	<b>carlene</b> 2:21 4:19 7:4 11:21
150:2 150:3 150:6 150:10 150:12	126:12 131:17 141:10 142:3	159:24 <b>buildings</b> 59:3	campbell 8:18 cannot 32:9 50:4	
150:2 150:3 150:6 150:10 150:12 150:16 151:1	126:12 131:17 141:10 142:3 142:23 143:4 146:8	159:24 <b>buildings</b> 59:3	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4	11:21
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24	126:12 131:17 141:10 142:3	159:24 <b>buildings</b> 59:3 <b>built</b> 32:8 32:12	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23	11:21 <b>carries</b> 60:12 92:7 94:21
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10	126:12 131:17 141:10 142:3 142:23 143:4 146:8	159:24 buildings 59:3 built 32:8 32:12 69:17	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10	11:21 carries 60:12 92:7 94:21 carry 90:24
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 <b>bothers</b> 88:3 <b>bottom</b> 89:2 125:11	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 <b>bothers</b> 88:3 <b>bottom</b> 89:2 125:11	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13	11:21 carries 60:12 92:7 94:21 carry 90:24
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 <b>bothers</b> 88:3 <b>bottom</b> 89:2 125:11 <b>boundaries</b> 134:2 134:3	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 <b>bothers</b> 88:3 <b>bottom</b> 89:2 125:11 <b>boundaries</b> 134:2 134:3	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 <b>bothers</b> 88:3 <b>bottom</b> 89:2 125:11 <b>boundaries</b> 134:2 134:3	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12 boilermakers 6:12	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22 113:15 114:19	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22 button 54:17 55:7	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14 108:17 109:6	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15 categories 44:15
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22 113:15 114:19 brand 91:5	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22 button 54:17 55:7 55:11 166:21	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14 108:17 109:6 110:19 111:5 111:8	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15 categories 44:15
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12 boilermakers 6:12	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22 113:15 114:19 brand 91:5 break 45:12 84:8	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22 button 54:17 55:7 55:11 166:21 buttons 46:15	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14 108:17 109:6 110:19 111:5 111:8 111:11 112:6	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15 category 145:3 cause 46:9 103:22
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12 boilermakers 6:12 boilers 31:14 32:2	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22 113:15 114:19 brand 91:5 break 45:12 84:8 breaking 53:25	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22 button 54:17 55:7 55:11 166:21 buttons 46:15 buy 111:20 144:4	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14 108:17 109:6 110:19 111:5 111:8 111:11 112:6 114:14 115:4	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15 category 145:3 cause 46:9 103:22 143:14
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12 <b>boilermakers</b> 6:12 <b>boilers</b> 31:14 32:2 42:25 43:3 44:2	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22 113:15 114:19 brand 91:5 break 45:12 84:8 breaking 53:25 brian 2:2 4:21	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22 button 54:17 55:7 55:11 166:21 buttons 46:15 buy 111:20 144:4 buying 145:13	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14 108:17 109:6 110:19 111:5 111:8 111:11 112:6 114:14 115:4 115:15 116:5	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15 categories 44:15 category 145:3 cause 46:9 103:22 143:14 cautious 165:9
150:2 150:3 150:6 150:10 150:12 150:16 151:1 151:17 151:24 152:8 152:10 152:24 153:9 153:12 154:3 154:5 155:16 155:17 156:5 156:7 156:10 156:16 157:6 159:25 160:3 160:11 160:17 160:18 161:5 161:7 161:11 161:12 162:1 162:5 162:9 162:10 162:14 163:7 163:8 163:19 164:4 165:5 168:7 170:12 <b>boilermakers</b> 6:12 <b>boilers</b> 31:14 32:2 42:25 43:3 44:2 48:20 49:19 55:17	126:12 131:17 141:10 142:3 142:23 143:4 146:8 147:11 162:7 bothers 88:3 bottom 89:2 125:11 boundaries 134:2 134:3 boundary 23:3 24:1 133:4 135:4 137:18 137:23 137:24 bowling 10:23 box 98:5 101:15 101:16 106:17 106:21 boxes 112:23 boy 10:6 branch 65:12 66:22 113:15 114:19 brand 91:5 break 45:12 84:8 breaking 53:25	159:24 buildings 59:3 built 32:8 32:12 69:17 bullet 66:6 bulletin 104:19 104:20 burned 167:17 burner 28:10 28:12 29:21 67:12 132:25 burr 59:11 business 3:12 3:13 19:23 19:23 20:1 20:1 20:9 65:19 84:12 95:4 108:18 110:9 168:2 businesses 16:8 bust 153:22 button 54:17 55:7 55:11 166:21 buttons 46:15 buy 111:20 144:4	campbell 8:18 cannot 32:9 50:4 55:12 60:20 129:4 159:23 canonico 2:8 4:10 6:22 6:22 8:15 8:17 8:23 18:4 23:13 41:10 42:4 52:13 52:14 53:17 55:13 56:13 56:22 56:25 57:4 58:1 58:2 58:22 58:24 59:10 60:10 61:17 64:15 64:21 65:1 65:5 88:2 88:8 91:13 93:12 94:22 97:5 97:8 97:17 100:19 100:20 105:23 106:9 108:4 108:14 108:17 109:6 110:19 111:5 111:8 111:11 112:6 114:14 115:4	11:21 carries 60:12 92:7 94:21 carry 90:24 case 21:1 22:15 28:13 31:4 33:22 36:12 36:15 37:11 40:16 60:2 108:19 108:20 110:24 127:13 129:21 132:25 133:18 151:22 167:1 cases 3:19 3:20 35:14 127:18 168:15 cassandra 1:22 4:14 4:15 170:4 170:24 cat 135:24 catastrophic 26:15 category 145:3 cause 46:9 103:22 143:14

	<u> </u>		<u> </u>	_
145:7 145:9	83:14 83:17 83:20	143:18 143:22	<b>chart</b> 81:1 81:17	<b>cite</b> 118:15
cer 1:22 170:24	83:22 83:25 84:5	144:1 144:14	81:20	cited 123:7
cement 39:24	84:11 84:21 87:19	144:22 145:4	<b>charted</b> 17:21	citizens 13:19
center 43:4 65:19	87:23 88:6 88:9	145:21 146:2	chase 95:8	claim 21:18
central 65:15	91:10 91:15 91:25	146:18 146:23	check 41:22 73:13	clarification 20:20
certain 67:25 76:7	92:4 92:21 93:6	147:10 147:25	73:14 73:14 81:3	25:19 36:8 39:25
101:18 166:3	93:11 93:15 93:20	149:7 149:11	116:7 150:2 150:10	l
certainly 7:3 10:24	94:6 94:9 94:13	149:15 151:12	151:16 154:16	120:11 136:23
12:12 37:18 39:21	94:15 94:17 94:20	152:7 152:21	158:23 158:25	clarified 59:21 97:24
41:3 41:5 116:23	94:24 95:2 95:15	153:15 157:3	158:25 162:11	143:3
certificate 77:4 92:9	06140610051	157:20 158:20	166:23	clarify 61:11 79:15
113:2 119:13 144:3	00 10 100 10 101 0		<b>checked</b> 86:23 148:3	
certificates 144:5	101:5 101:10	159:22 160:4	148:6 148:10	142:25 148:14
certification 109:22	101:22 102:7	160:21 160:25	148:12 148:23	clarity 68:11 81:25
109:22 135:13	104:25 105:3	161:4 161:21	150:13 150:14	150:21
certify 170:5 170:15	106 10 106 10	167:25 168:14	150:13 150:14	clarksville 5:24 6:1
cetera 52:18 55:23	106:19 107:22	169:1	152:11 152:17	128:9
92:24 117:25	107:24 108:2	<b>chance</b> 13:16 50:13	153:10 153:12	classes 104:1 104:7
132:20	108:12 108:16	64:8	154:2 156:11	classification 39:17
chairman 2:2 4:2	109:8 110:21 111:7		156:16 160:11	classified 21:21
4:21 5:12 6:24 7:2	111:10 111:13	100:20 119:18	161:14 162:20	24:15 24:25 39:8
	111:22 111:25	127:5 127:8 129:1	163:10 163:11	
7:8 7:16 7:18 8:10 8:16 8:20 8:24 9:2	112:8 115:1 115:9		163:10 163:11	41:23 53:20 55:17 55:24 144:25 145:5
9:14 9:17 9:19 9:21	115:16 116:2 116:6		164:22 165:2	classify 39:13
9:23 10:1 10:7	116:14 116:19	145:24 146:14	<b>checking</b> 72:1 152:8	, ,
10:21 12:10 12:15	116:22 117:21	147:15 161:1	153:3 153:9 162:10	classifying 35:17 classroom 86:17 87:
12:20 17:24 18:2	118:18 118:22	<b>changed</b> 83:13 124:4		clause 35:20
18:17 18:25 19:2	119:2 119:7 119:11	125:21 137:25	78:7 156:10 157:23	<b>5</b>
19:5 19:9 19:19	119:21 121:17	140:23 141:3 141:6		clay 85:5
19:22 21:14 21:24	121:25 122:5	141:11 141:14	checks 149:25	<b>clayton</b> 22:10 36:15
23:10 23:14 23:18	122:10 122:14	141:15 141:15	153:19 156:11	36:25 37:14 38:2
26:12 30:4 33:24	122:24 124:5	142:3 143:4 143:5	156:19 156:22	38:4 39:7 39:18
38:12 38:17 39:1	124:16 124:25	144:21 145:16	162:6 162:7 164:25	40:17
40:6 40:10 41:1	125:4 125:7 125:23	145:17 146:6	<b>chemical</b> 4:22 154:5	Clean 36.2 36.21
41:8 41:17 42:3	126:3 126:7 126:16	147:23 163:16	156:24	cleaned 120:24
42:5 42:8 42:11	127:23 128:5	163:17 163:17	<b>chemistry</b> 72:1 72:11	cleaner 58:4
42:13 42:16 42:20	128:23 129:11	changer 56:16	<b>chief</b> 2:16 3:11 4:18	cleaning 147:9
43:9 47:5 47:9	129:17 129:25	<b>changes</b> 82:21 83:1	9:7 9:11 19:7 19:18	clear 67:21 68:18
47:18 52:11 54:20	130:6 130:11	118:5 120:12	47:12 70:2 105:17	99.17 133.22 134.
54:23 55:1 59:16	130:19 131:1 131:3	140:18 143:8	109:13 109:14	134:10
61:9 61:12 65:3	131:8 131:16	143:15	110:3 110:4 170:9	clearly 62:18 129:4
65:7 70:13 70:18	131:21 134:12	changing 112:14	170:9	134:21 138:6
71:1 74:15 75:17	136:25 137:5 138:3	143:11 147:1	choose 157:2	cleaver 88:25
76:12 78:3 78:6	138:13 138:15	<b>chapman</b> 2:16 4:17	<b>chops</b> 153:23	cleverly 88:7
78:10 78:17 78:21	138:19 138:23	4:17 19:8 128:10	circulatic 20:21	clients 32:21
78:25 79:10 79:14	139:7 139:11	128:14 144:11	20:22 21:3 22:1	<b>clint</b> 5:6
79:19 80:1 80:3	140:14 140:17	144:16 145:20	22:13 26:20 28:4	<b>clogging</b> 104:18
80:7 80:14 80:21	140:20 141:7	<b>chapter</b> 43:1 137:13		close 106:20
81:5 81:12 82:12	141:16 142:4 142:8	<b>charge</b> 113:24	circulation 31:20	<b>closer</b> 96:13
82:25 83:4 83:8	142:12 142:20	158:19	circumstances 44:24	closest 40:19
	143:1 143:7 143:13			closures 97:16 98:13
L	l		l	

<b>clyde</b> 10:8 10:8	105:15 106:18	competency 113:2	50:18	controls 28:3 28:12
<b>code</b> 3:16 18:5 18:6	107:23 108:17	competitive 22:15	connection 49:7	30:14 32:9 32:22
19:13 22:17 23:3	112:4 112:9 112:13		50:17	33:15 34:22 132:25
23:8 24:1 24:7	118:2 119:25 120:2	competitors 36:23	connections 29:10	133:16 138:9
24:15 25:1 25:5	120:21 131:4 148:2	compiling 157:25	consent 15:8	controversial 15:7
25:6 25:8 28:22	155:6 161:18	completed 13:5	conserve 124:2	conversation 60:6
41:7 100:13 118:9	163:23 167:3	95:21 110:4	consider 87:21	96:21 135:18
118:17 119:14	comments 17:25	completion 105:21	114:25 118:4	converse 130:8
120:4 120:5 121:5	19:20 23:20 30:5	compliance 11:12	120:12	cool 138:18
122:1 123:18	39:3 41:24 42:6	15:18 170:12	consideration 21:3	<b>copies</b> 8:11 96:9
124:11 124:12	47:20 52:12 61:13	<b>comply</b> 154:24	considered 125:1	96:16
125:18 133:1	65:8 74:16 80:12	155:13	125:5	<b>copper</b> 102:17
137:14 137:22	82:3 82:11 83:15	component 22:6	considering 40:2	<b>copy</b> 47:24 79:16
147:22	91:11 91:12 91:16	22:18 30:8 30:12	consistent 81:21	79:18 121:24 131:7
codes 67:23 67:25	93:21 94:7 95:24	componentry 23:1	112:18 116:17	corner 157:5
68:4 68:12	96:3 96:4 96:6	components 135:7	constants 126:9	corporation 3:5 5:20
coil 27:9 27:9 29:9	96:11 96:23 97:3	139:25 139:25	constitute 132:24	84:16 118:7 132:4
29:11 29:24 29:25	97:6 98:14 98:16	comptroller 13:4	constitutes 148:3	correct 23:23 24:17
30:10 30:13 30:14	101:6 106:7 111:22	computer 166:13	constructed 21:4	28:15 30:11 40:5
30:21 30:23 31:5	120:15 120:20	166:16 166:18	137:10	40:24 40:25 41:2
32:5 33:2 33:4 34:6	131:23 131:24	166:20	construction 113:11	
34:11 34:15 34:16	161:16 168:4	<b>concentric</b> 33:4 33:6		69:6 70:1 70:10
coils 27:14 27:22	commission 12:24	concern 41:9 93:12	137:7	71:11 74:25 75:16
27:24 33:7 34:6	102:2 102:5 115:2	100:23	consultant 6:16	78:19 79:3 81:9
34:12 34:13 34:17	170:25	concerned 71:19	contact 16:18 60:14	88:13 89:8 90:19
34:21 39:20 39:22	commissioning	concerning 95:24	70:2	94:2 111:13 117:2
41:4	113:1	105:9 108:22	contained 45:15	117:24 118:3
<b>cold</b> 29:14	committee 13:14	concerns 138:21	45:18 45:22	118:15 118:16
collected 25:21	13:14 13:17 14:14	concludes 19:17 95:3		118:23 124:5
collecting 26:4	14:15 14:22 14:25	condition 28:1 29:14		1040410010
<b>color</b> 96:9	15:5 15:12 16:5		contents 80.24 81.14 context 112:24	131:9 142:10 143:4
<b>colors</b> 17:22	16:10 16:11 16:24	34:24 44:22 64:1		163:5
column 74:6	17:2 17:10 18:15	133:10	contingency 47:11	corrected 92:6
<b>combined</b> 22:8 52:25	<b>common</b> 28:8 30:9	condones 121:13	contingent 87:24	
combustion 6:7 6:9	30:19 165:4	<b>conducted</b> 97:12	<b>continue</b> 33:19 104:2	118:12
33:10 33:11	commonly 32:15	97:24 98:8	168:5 168:6	20.0
comes 13:11 82:24	communication	conducts 13:5	<b>continuing</b> 87:4 87:5	correlating 134:18
83:12 107:21 122:7	45:12 65:19	conference 104:9	117:23	corridor 46:18
139:1 147:3 147:4	communications	104:22 168:8	contractor 131:25	22.1
147:4 150:18 151:3	65:16	configuration 136:9		corvette 10:22
151:23 158:22	companies 53:13	<b>confirm</b> 116:3	contractors 132:14	cost 153:6
166:8	53:15 104:5 115:18	<b>conflict</b> 20:2 20:5	140:9	l
comfortable 14:3	<b>company</b> 4:22 53:5	38:14 70:3 84:20	contradicting 129:20	00818 103:22
107:25 155:22	86:16 104:4 115:18	84:22	contribute 121:5	cothern 5:6 5:6 85:5
coming 14:5 15:23	compare 40:20	<b>conflicts</b> 18:10 43:6	<b>control</b> 6:7 6:9 32:4	85:5 90:17 90:22
49:2 49:7 65:15	compared 22:15 27:1	7 84:18	32:13 34:23 45:3	94:2
147:6	32:1 40:15 81:1	confusing 59:20	45:25 70:9 85:25	couldn 37:14 76:19
comment 38:13 48:9		81:25	86:2 87:9 87:11	counsel 2:20 5:5
76:24 97:6 97:8	116:10	congratulations	103:8 133:17 135:7	
97:17 97:22 101:21	competed 36:25	10:24	149:4	counts 124:11
71.11 71.44 101.41		<b>connected</b> 34:6 34:12	2 controlling 25:12	124:12

<b>county</b> 170:3	data 22:4 22:7 23:21	148:11 151:8	87:25 105:18 110:2	device 25:22 45:13
couple 22:22 38:13	24:9 45:24 77:8	<b>defines</b> 23:3 148:4	description 50:13	<b>devices</b> 27:20 135:8
128:22	77:11 77:23 77:25	151:2 151:8	64:20 68:17 93:4	155:1
<b>course</b> 29:14 146:9	88:22 90:6 90:7	definite 18:7	descriptions 46:24	<b>devil</b> 63:9
<b>court</b> 1:23 4:16	110:2 110:5	definitely 24:13	design 20:25 26:20	diagram 23:2
38:20 82:7 151:5	<b>date</b> 12:25 14:6 17:1	24:23 37:20	26:20 26:23 27:3	diameter 27:10 29:4
<b>covenant</b> 6:5 43:15	18:7 18:15 78:1	<b>definition</b> 25:2 25:14		<b>didn</b> 18:21 35:19
43:17 66:22	159:19	39:24 40:13 41:7	29:9 29:19 30:24	37:7 57:15 58:23
<b>cover</b> 36:20 48:6	<b>dated</b> 140:2	65:25 99:17 120:2	30:25 31:3 31:3	69:5 91:22 94:3
115:10	dates 14:11 18:11	123:12 123:13	31:8 31:11 31:19	131:4 134:24
<b>covered</b> 63:18 83:9	121:20 127:7	132:18 132:23	32:1 33:4 33:5	139:23
covers 115:11	dave 4:23 104:20	133:7 133:19 134:5		difference 57:24
create 51:16 157:18	149:22 151:23	134:10 134:16	113:18 122:15	59:17 59:22 147:8
165:2	<b>david</b> 2:11 6:8	134:18 136:14	129:2 129:5 129:6	differences 60:6
created 24:1 165:19	day 11:14 44:17	137:21 137:23	129:19 133:11	<b>different</b> 31:6 65:23
creation 40:9	44:17 62:9 63:24	138:11 141:20	155:1	80:25 81:23 82:22
creep 125:22	71:20 76:12 120:22		<b>designated</b> 55:16	82:23 86:4 86:13
<b>crisis</b> 60:14	170:13 170:21	145:15 147:1	88:18 89:1 140:22	121:10 123:4 126:6
criteria 107:3 139:10	days 85:12	149:25 150:22	designation 88:19	143:21 144:20
141:12 156:15	dcs 155:2 155:8	151:7 152:25	designations 88:15	150:20 152:9
158:18 163:11	156:25	153:10 <b>definitions</b> 133:21	designator 109:23	154:22 163:8 164:8
critical 30:7 30:12	deaerator 90:7 92:7	137:6	<b>designed</b> 31:9 31:19	differentiation 36:2
cross 118:14	155:20	degree 112:10 113:9	41:4 137:10	differentiations
csd 28:7 28:12	deal 141:17	113:14 113:16		102:20
134:25 135:7	dealing 90:4	113.14 113.10	109:15 110:4	differently 51:7 51:8
135:11 135:15	death 62:1	114:20 114:23	170:10	difficult 29:3 32:22
136:9 136:11 138:8		degrees 33:21 33:23	desired 137:11	154:24
138:25 139:17	11:22 79:5 96:12	20 1 6 20 21 112 7	desk 153:8 detail 17:18 25:17	diligence 102:5
158:6 166:2	<b>december</b> 3:22 14:10	115:3 125:16		167:24
ct 3:21	14:10 96:7 168:4	11 54 10 105 20	89:21 89:24 89:24 93:14	direct 8:3
curious 48:18 66:18	168:6 168:9 168:17	delays 50:3	detect 27:20 29:1	direction 153:2
current 40:17 77:4	168:22 <b>decide</b> 121:1 127:14		determination 166:1	director 5:9 6:4 85:4
80:18 91:9 104:11		deleted 97:23	determine 68:13	districtived 157.25
currently 85:11 91:2		delinquent 19:10	determine 08:13	disaster 7:25
148:10	<b>decision</b> 100:22	19:12	120:17	discuss 14:13 21:11
<b>customer</b> 99:13	105:9 <b>declare</b> 40:21 84:19	demand 85:12	determines 100:7	96:5
151:22	dedication 11:15	154:12	107:3	<b>discussed</b> 91:16
cut 85:16	12:4	demonstrate 86:20	<b>develop</b> 104:10	91:17
cyclotherm 68:24	deem 14:21	department 1:1 3:22		discussing 147:14
D	deems 17:23	5:22 6:16 11:9 12:1	1 20.112	148:2 <b>discussion</b> 3:15 8:21
da 48:23 48:24 49:6	defeat 32:22	12:23 12:24 14:17	developing 104:24	
49:6 49:17 50:9	defeated 32:19	14:18 15:17 16:3	development 1:1	8:25 12:13 15:12 20:7 20:14 23:19
50:9 50:13 73:14	defer 79:19 120:13	16:7 53:2 132:10	3:22 5:22 11:10	
76:25 77:13 90:23		168:17 170:10	12:2 132:11 168:18	41:15 47:6 47:20
91:4 94:1 94:4	<b>define</b> 120:2 138:7 148:14 151:14	dependent 54:13	170:11	88:10 91:21 95:4 95:7 95:17 95:18
daily 71:16 73:16	153:11	depending 15:6	developments 18:23	
156:19 158:10	<b>defined</b> 57:19 59:20	28:21 126:8	devers 5:23 5:23	118:3 120:11
damage 151:18	99:11 117:12	<b>depends</b> 158:18	156:18 156:20	128:24 130:9
damper 149:3	119:17 132:1	deputy 47:13 82:13	<b>deviation</b> 133:11	134:16 139:5
uamper 149.3	117.1/152.1	- F	GCVIGHUH 133.11	157.10 157.5

	<u> </u>		Г	
145:22 151:11	81:21 81:24 92:8	100:19 100:20	38:24 40:5 40:8	76:7 79:23 100:3
153:14 167:7 168:2		105:23 106:9 108:4	1	110:17 114:18
168:6	99:22 100:3 100:15		42:18	141:12 148:20
discussions 23:12	103:21 108:21	109:6 110:19 111:5		165:24
	111:19 114:8			elliot 7:18
dispatchers 59:18		111:8 111:11 112:6		
59:23 60:7	114:24 115:1	114:14 115:4	60:14 78:11 124:1	else 8:25 18:25 147:4
distance 45:17	115:17 119:7	115:15 116:5	duty 46:12 61:2	150:6 150:20 161:3
ditty 139:21	121:14 121:24	119:25 120:14	dvd 53:12	elsewhere 123:3
<b>divided</b> 44:15 120:6		120:20 121:2	dz 22:11 36:15 36:19	
126:15	125:2 129:17 135:8		37:24 39:7 40:17	116:9 120:14
<b>division</b> 11:11 11:12	l		40:18	emails 130:8
15:18 121:8 123:23		122:16 123:6 123:9		embedded 33:9
124:7 124:22	145:23 150:5 150:7			emergency 7:25
170:11	158:24 159:18	123:25 124:6	e110 51:4	46:15 50:23 53:9
<b>dm</b> 129:1	160:6 161:17	124:14 124:20	<b>e204</b> 40:18	54:12 55:7 55:10
document 85:16	162:12 162:15	125:20 126:1 126:5	00000 10:10 20:5	59:14 59:23 60:2
114:4 114:7 114:8	162:18 163:20	126:11 126:18	20:4 22:18 27:22	emphasized 91:19
documentation	163:23	126:25 127:4 127:6	30:14 34:6 34:15	employed 117:5
48:14	<b>done</b> 11:17 19:9	128:16 129:8	34:19 49:10 68:5	<b>employee</b> 87:6 104:3
documented 86:24	24:10 69:23 86:16	129:16 129:24	71:20 71:20 75:8	employees 87:8
166:15	92:14 100:17	130:5 130:24 131:2	00.1 07.11 1 13.11	104:2
documents 139:22	117:10 124:14	131:14 131:19	eagle 2:6	encouraged 104:2
157:10	152:18 162:6	159:14 159:18	earlier 57:18 64:22	end 29:22 39:5 48:18
doesn 25:25 41:21	door 29:22 46:19	168:10 168:13	117:12 166:25	101:16 101:16
58:19 73:15 74:12	152:24 156:13	<b>draft</b> 96:5 140:15	early 44:8 48:12	145:13 152:18
78:7 81:15 93:1	doors 144:4	168:5	154:7	169:5
99:3 99:4 99:7	down 44:23 46:6	drain 98:24	ease 3:17	ended 100:24 104:21
115:9 123:19 134:4	46:10 46:15 46:20	<b>drawing</b> 22:23 48:19	easier 83:11 95:20	107:5 148:3 150:17
135:8 136:21	51:22 52:1 52:3	48:20 49:5 69:10	east 2:9	150:17 151:4
137:23 141:12	54:9 55:8 55:10	70:8	eastern 4:22	ends 14:17 101:17
141:21 146:19	55:12 67:13 67:14	drawings 22:22 49:9	eastman 141:17	energy 25:13 26:23
149:19 160:8 160:9	73:17 73:20 74:4	drilling 53:8	143:16	27:2 27:6 27:15
163:12	74:12 95:9 97:14	<b>drive</b> 2:6 3:23	easy 29:8 99:8 100:4	
doing 7:20 59:5 60:7	98:11 98:24 139:3	dropout 31:21	economizer 92:5	enforced 76:13
60:9 61:20 71:22	140:21 144:4	dropped 76:8	<b>ed</b> 6:11 9:8 10:7	103:23
82:17 102:5 104:4	144:11 147:2 151:3	0,-0,	10:11 12:10	enforcing 76:14
139:24 159:2	159:1 159:2 159:20	due 79:9 102:5	education 112:14	eng 96:17 96:25
167:24	160:14	105:21 167:24	112:21 113:6	154:3 155:19
dolphins 115:24	downs 71:25 155:15	<b>dupuis</b> 5:16 5:16	113:20 115:12	156:23
domenic 2:8 6:22	dr 2:8 4:10 6:22 8:15	20.11 21.17 21.23	115:22	engage 132:5
don 7:11 8:12 10:21	8:17 8:18 8:23 18:4	23:24 24:8 24:18	edwin 12:3	engaged 134:20
13:7 18:12 18:19	23:13 41:10 42:4	24:22 25:3 25:15	effect 15:25 16:6	engineer 113:24
27:5 27:6 31:17	52:13 52:14 53:17	25:24 26:8 26:18	16:7 44:11	115:23 154:5
32:20 46:11 48:2	55:13 56:13 56:22	27:21 28:13 28:15	efficiency 125:1	engineering 3:4 5:15
49:6 49:9 49:11	56:25 57:4 58:1	29:6 30:11 30:23	efficient 89:15	6:3 6:5 42:24 43:13
49:12 49:12 49:14	58:2 58:22 58:24	32:15 33:1 33:20	155:24	53:2 85:2 112:11
54:8 59:8 61:23	59:10 60:10 61:17	34:2 34:5 34:9 35:7	efforts 12:5	113:10 113:15
61:24 61:25 66:3	64:15 64:21 65:1	36:4 36:13 37:10	eight 47:4	113:10 113:13
66:15 69:4 74:24	65:5 88:2 88:8	37:13 37:17 37:23	either 8:2 14:8 15:6	114:19 114:10
76:4 79:16 79:22	91:13 93:12 94:22	38:3 38:6 38:23	15:23 18:22 49:14	114.19 114.23
	97:5 97:8 97:17		13.23 10.22 49.14	113.3

k167-22			TC.	f1-: 20-24-27-25
enhances 167:23	eugene 2:5 4:9 6:20	example 31:5 33:22	F	<b>fashion</b> 20:24 37:25
enough 14:21 26:23	115:18 130:11 138:8 168:4	75:4 86:25 87:2	<b>face</b> 104:10 104:10	156:17
65:21 96:7 126:6		101:15 <b>exceed</b> 27:24	135:5	<b>fastly</b> 166:17
155:13	<b>evaporation</b> 31:10		<b>facilities</b> 5:7 62:23	<b>fault</b> 68:5 151:20
ensure 36:20 45:14	even 54:8 107:10	exceeding 39:21	81:16 85:6	<b>faults</b> 46:4 68:12
155:23	125:22 154:6	125:15	<b>facility</b> 60:19 62:3	<b>favor</b> 9:19 42:9 83:18
enter 20:6 23:11	160:19 162:3	excess 24:17 25:11	64:16 64:18 86:4	94:10
enters 29:12	event 7:24 8:5 26:15		90:5 151:1 155:11	<b>feasible</b> 3:18 167:4
entire 118:17	26:15 26:22 27:17	exchange 65:12	159:24	<b>feed</b> 31:23 31:24
entities 103:13	44:22 54:15 55:4	excited 10:14 108:7	facsimile 110:6	149:2
entity 14:19 136:1	events 26:16 53:10	excuse 45:19 109:6	<b>fact</b> 22:16 36:22	<b>feeder</b> 104:18
entrance 46:22	ever 34:1 48:15	126:25	41:20 69:14 100:2	<b>feedwater</b> 91:7 93:25
entry 31:24	163:20	exempt 40:23	147:2	feel 14:3 53:2 95:21
<b>enunciate</b> 51:7 51:8	every 12:23 12:23	exempted 41:19	<b>factor</b> 120:1 120:3	139:13 155:22
enunciates 51:25	12:23 17:12 41:22	exemption 21:17	120:8 121:3 121:6	<b>feet</b> 44:1 45:17 85:19
eons 140:2	47:3 48:8 72:16	21:20	121:10 121:12	85:20 148:21
equal 34:13 34:14	109:18 128:8 142:16 151:24	existing 46:1 51:14	121:24 122:12	fellows 115:20
113:7 125:12	4 7 9 9 4 7 9 9 9	78:24 80:9 125:8	122:20 123:13	few 10:4 12:21 80:15
<b>equation</b> 38:5 121:11		exit 33:13 33:21	123:17 123:23	96:2 96:9
122:1 122:25 125:9	162:11 162:11	<b>expand</b> 133:20	124:7 124:21	<b>field</b> 47:15 76:18
125:10 125:25	162:21 163:10	<b>expected</b> 17:4 53:24	124:22 124:23	98:20 99:24
126:2 128:25	165:12 165:21	expecting 7:4	129:2	fieldstone 1:23
159:21	165:23	experience 36:18	factory 140:5	<b>fifth</b> 67:5
equations 126:19	everybody 4:6 4:12	53:1 56:4 92:24	fahrenheit 33:22	<b>fight</b> 140:11
128:20	7:13 74:20 97:4	99:24 112:7 112:22	1	fighting 144:7
equipment 22:18	101:7 104:22	113:6 113:11	<b>fail</b> 34:1 34:3 68:13	<b>fights</b> 53:25 60:13
30:2 50:13 78:15	101.7 104.22	113:18 113:21	<b>failure</b> 26:24 45:13	<b>figure</b> 85:14 166:24
90:4 93:17 167:15	122:21 145:22	114.10 114.20	67:8 151:17	<b>file</b> 87:3 110:3
equipped 46:14	150:20 157:17	114:21 115:6	<b>failures</b> 30:21 30:23	
149:2	161:3 167:11	115:10 115:13	66:9 67:6 104:12	<b>filled</b> 47:2 74:22 87: <b>1</b>
equivalent 112:10	168:20 169:1	154:15	<b>fairly</b> 30:24	87:2 100:5
112:12 112:15	everyday 162:13	expert 54:21	<b>fall</b> 24:6 35:20 40:21	
112:22 113:21	everyone 65:18 75:6	expires 170:25	40:22 41:6 104:9	<b>fills</b> 101:25 102:1
114:25 115:22	136:2 136:8	<b>CAPIAIII</b> 13.17 10.3	104:22 168:8	<b>final</b> 28:24 105:18
116:17	everything 11:16	164:10	falling 14:17	<b>find</b> 30:9 40:20 57:24
erection 132:5	136:12 155:22	explosion 26:22	falls 25:13 40:13	60:15 81:14 81:16
erector 132:13	164:13	explosive 27:17	100:8 102:3 161:8	102:11 138:7 166:2
erectors 132:3	<b>evidence</b> 166:15	<b>exposures</b> 103:15	false 46:8 55:5	<b>findings</b> 13:7 13:15
ernest 6:2 43:12	ewell 2:19 5:4 5:4	103:19	familiarity 88:19	<b>fine</b> 41:5 83:14 106:9
ernie 54:5	95:14 118:12	express 130:14	<b>family</b> 46:19	143:11
escorts 59:2	118:21 118:24	<b>extended</b> 67:13	<b>far</b> 7:2 13:10 17:3	<b>finish</b> 36:5 84:9
especially 77:11	119:5 123:5	extent 142:10	17:14 18:3 24:7	<b>finks</b> 5:2 5:2 131:6
98:18 98:21 151:4	exact 25:5	<b>external</b> 29:10 29:16		131:13
esq 2:17 2:19	exactly 13:25 30:20	29:25 33:11 97:13	61:15 71:19 71:20	<b>fire</b> 27:7 29:20 29:24
essentially 78:14	65:9 82:10 125:3	98:1 98:10	81:10 81:13 86:10	45:6 45:8 45:10
114:22	149:19	extinguisher 54:11	87:9 92:22 104:11	54:10 54:11 89:4
establish 148:15	exam 113:1 113:4	extreme 144:7	115:21 140:2 144:6	10 1112 10017
164:24 165:1	examination 73:20	extremely 34:2	150:22 150:25	firearm 60:13
et 52:18 55:23 92:24	113:2 113:6	<b>eyes</b> 70:6	153:18 157:14	<b>fires</b> 60:13
117:25 132:20	113.2 113.0		157:21 161:24	<b>fireye</b> 46:2 51:4

140:6	22:16 35:1 53:20	fudged 162:4	86:11 89:21 90:1	147:2 147:3 147:3
<b>firm</b> 118:7 132:4	55:19 56:1 113:7	fuel 23:1 28:9 28:22	98:21 98:24 99:1	151:4 167:15
<b>first</b> 10:12 11:4 20:8	<b>follows</b> 105:25	149:2	99:3 99:6 100:3	going 4:11 10:15
20:17 48:12 66:5	132:10	<b>fulfill</b> 153:18	104:15 108:7	12:17 14:5 15:1
84:17 95:5 97:6	<b>font</b> 82:22	<b>full</b> 154:11	112:24 115:24	15:24 31:21 33:20
119:17 120:16	footnote 39:12	<b>fulton</b> 37:8 104:17	115:25 115:25	50:25 51:25 52:2
123:4 135:5	force 61:7 78:8	104:17 104:23	116:20 118:19	55:5 55:6 59:13
fitness 105:9	forces 135:18	<b>function</b> 13:1 13:17	123:10 128:7	60:24 61:16 61:22
fits 156:8	ford 40:16	17:9 22:13	129:13 130:13	62:16 63:22 68:10
<b>five</b> 14:2 62:7 66:23	foreign 122:18	functioning 45:14	137:6 137:16 139:2	71:15 71:24 73:3
112:15	foreman 86:5 86:14	further 21:12 59:1	139:14 139:18	79:23 80:3 83:11
fixed 88:7	forgiving 31:19	97:24 107:10	140:5 144:2 144:5	83:18 84:7 92:1
flags 15:7	form 110:5 110:14	112:16 118:3	146:9 151:7 151:13	l
flame 45:24	117:18 125:5	120:11 170:15	156:12 156:12	96:5 96:11 97:1
flange 135:5	142:23 142:24	<b>future</b> 41:3 107:20	163:23	98:4 101:6 101:8
flash 22:5 23:7 24:2	146:19 146:24		<b>gets</b> 142:17 143:15	104:21 105:4
24:3 26:6 40:7	149:4 156:16 159:6	G	159:20	106:13 109:1 109:2
flashing 25:20 26:10	I	gain 21:2 109:7	<b>getting</b> 31:11 36:9	110:8 119:23
40:9	forms 101:25 117:19	O	114:22 150:8 159:1	121:14 123:2
<b>flood</b> 61:3	forth 16:8 78:1	135:14 136:2	159:2	126:23 129:8
floor 8:13 12:19	136:13 155:21	139:25 139:25	give 12:17 32:20	130:21 130:22
20:12 20:16 23:19	159:3 163:25	gather 76:16	33:17 61:11 65:2	131:5 131:22
27:2 41:18 47:19	165:22	gauges 56:19 72:18	65:21 107:20 152:2	131:22 138:6 138:7
61:3 88:10	<b>forward</b> 10:3 10:16	general 22:22 28:19	given 89:24 89:25	138:24 140:3
flow 30:6 30:15	20:13 43:5 95:12	28:20 30:3 56:7	121:11 124:7	144:13 144:20
30:22 31:6 31:6	165:2	generally 31:13	127:14	146:3 146:3 146:9
31:6 31:12 33:5	<b>found</b> 19:14	34:12	gives 52:19 133:21	146:15 147:1 147:8
34:15	four 14:11 18:11	generate 46:9 51:20	<b>giving</b> 149:10 163:24	147:18 149:16
flowers 6:8 6:8	31:7 31:20 34:21	generated 46:12	<b>glass</b> 73:5 73:10 74:4	
flows 131:15	34:21 47:3 48:4	161:13 162:15	74:12 142:14 150:4	
fluid 20:24 21:21	62:7 66:23 72:17	162:20	<b>go</b> 10:23 12:21 13:15	1:0 11 1:0 0
22:12 35:4 35:5	1	generating 23:23	15:4 15:21 16:13	165:22 165:23
35:6 35:8 35:11	163:10	23:24	17:1 17:17 20:1	165:24 166:5
35:16 35:17 35:18	<b>fourth</b> 67:5	generator 23:22	21:12 27:3 28:1	166:12 166:17
35:23 35:24 36:10	fractures 67:12	23:25 24:2 24:6	29:17 32:16 33:7	166:19 166:23
36:11 36:14 36:16	frame 16:21 18:5	25:20 35:25 52:18	35:2 36:5 39:11	166:24 167:19
36:19 36:23 36:24	franklin 1:24	generators 132:7	42:21 50:25 51:21	<b>gone</b> 4:9 76:21 144:6
36:25 37:3 37:7	french 3:23	gentlemen 20:11	55:9 56:18 58:17	<b>good</b> 10:5 11:5 26:18
37:9 37:15 37:19		43:5 43:10 83:25	64:9 68:4 70:5 71:6	27:21 29:7 32:23
37:21 38:10 39:6	frequency 128:13	84:17 84:24 95:3	72:23 90:7 96:11	33:1 67:16 68:7
40:18	154:16	168:1	100:19 101:10	69:15 75:12 78:9
flx700 89:1	frequent 154:20	george 1:23 4:16	105:20 108:24	93:14 95:10 96:6
fm 28:7	frequently 76:23	gerald 5:18	109:3 112:24 115:5	
focused 17:15	122:18	get 4:11 14:1 18:16	123:14 128:12	106:11 127:17
folks 54:15 54:16	friendly 95:20	20:19 25:19 28:11	137:7 140:21	158:5 158:14 167:6
71:22 75:9	front 25:16 29:21	47:5 48:7 48:15	143:19 144:6	got 4:8 10:4 10:16
<b>follow</b> 71:15 105:23	36:19 66:2 114:8	54:5 55:5 56:11	145:23 146:15	25:19 31:2 34:20
116:7 120:14	151:5 • 120:2 120:2 120:7		149:19 150:19	34:21 37:16 38:13
followed 28:22 86:19	<b>fs</b> 120:2 120:2 120:7	61 <b>5</b> 6 <b>5</b> 10 60 <b>3</b> 0	156:2 161:22 166:1	50:17 51:4 51:6
following 13:12	120.0 120.13 127.1	69:9 76:18 81:22	166:24	54:7 59:21 59:23
Tonowing 15:12	129:9	07.7 /0.10 01.22	goes 33:5 52:7 87:6	62:1 62:8 62:10

62.1.62.0.62.15	4 6 10	20 17 22 10 50 5	20 10 20 6 20 0	47 4 15 4 20
63:1 63:8 63:15	guest 6:10	29:17 32:19 59:5	38:10 39:6 39:8	hour 47:4 154:20
63:18 63:18 63:19	guidance 157:10	128:20 148:20	39:14 40:14 41:23	hours 47:3 52:17
63:22 65:21 67:16	guidelines 148:16	149:22 150:11	42:25 44:2 84:14	53:8 56:23 57:1
70:3 70:19 72:4	157:8	hawk 87:10	112:14 112:21	57:3 57:8 62:9
73:7 73:8 73:12	<b>guy</b> 58:5 61:4 64:4	header 49:1	113:12 113:19	72:17 162:12
76:9 80:14 82:19	154:6	heading 108:24	113:20 113:22	163:10
84:8 88:11 89:1	guys 53:4 60:24	health 6:5 43:15	113:24 113:25	how 8:17 17:5 17:17
90:8 91:8 91:12	62:24 63:16 63:21	43:17 85:9	115:11 149:3 156:7	
93:13 93:25 97:3 97:4 98:17 100:21	63:23 103:12	healthcare 55:18	higher 31:11 102:12	
101:15 110:22	115:25 128:11	55:25	103:1 129:23	62:1 62:2 66:17
110:23 113:8 121:3	153:24 165:19	hear 54:9 54:17	hiring 115:19	76:10 86:10 89:24
121:14 127:19	H	149:20 154:23	historic 161:5 162:8	100:25 121:1
128:2 135:5 141:20		161:18 161:19	historical 127:19	130:14 136:18
143:21 144:17		heard 11:5 139:5	historically 24:10	136:21 140:22
153:25 156:3 156:4	hamblen 43:3 43:18	hearing 13:21 14:7	history 61:23 109:10	
156:5 158:22 162:1	15.2   55.10 55.25	14:7 17:12 19:22	hit 54:17 55:6 59:24	151:25 153:8
162:2 163:7 164:16	64:25	38:17 43:9 105:3	60:2	155:10 159:18
165:19 167:4	1101101	hearings 13:13 13:14		164:11 165:9 <b>however</b> 14:19 17:9
168:10 168:13	164:21 164:21	15:16	hits 27:1 61:4	17:20 57:24 103:1
168:14	170:21	heartburn 114:15	holds 81:10	100.14
gotten 51:23 69:23	<b>handhole</b> 97:15	115:7 143:14	home 145:23 168:12	
government 13:13	98:12	heat 27:9 30:16	honeywell 45:10	hudgins 6:2 6:2
13:21 14:25 15:5	handle 53:24	85:13 148:21	46:1 139:23 140:6	43:12 43:12 43:20 47:23 48:1 48:11
grab 54:10	handout 97:2	heater 6:18 6:18	<b>honor</b> 11:13	48:24 49:11 49:18
grant 74:24	hangup 108:15	20:24 21:22 22:12	hope 96:6 168:20	49:22 50:2 50:8
grant /4.24 granted 30:25 31:9	happen 62:21 63:12	35:12 35:16 35:18	<b>hopefully</b> 4:10 9:5	50:14 50:20 50:22
31:16	165:25	35:18 35:24 36:10		51:1 51:11 51:17
	happened 135:10	36:11 36:14 36:16	hoping 58:15	51:20 52:2 52:5
granting 74:23 graphs 17:21	135:16	36:19 37:1 37:3	horse 154:1 154:8	52:22 55:4 56:2
	happens 4:7 71:19	37:7 37:9 37:15	156:4 156:7	56:8 56:15 56:24
gravitate 71:6	76:2 142:17 142:17		horsepower 28:17	57:7 57:12 57:14
gray 2:3	167:15	39:7 40:4 40:18	28:17 148:20	57.22 59.7 59.12
greater 25:17 36:21	110	158:16	hospital 43:18 43:24	58:15 58:20 59:9
148:22	21:10 115:7 122:21	heaters 35:4 35:5	43:25 44:6 44:12	62:4 63:5 63:25
green 10:23 109:16	168:20 168:21	35:6 35:8 36:23	47:3 52:24 53:1	64:12 64:24 65:6
greg 5:19	hard 11:15 30:19	help 82:2	56:3 63:2 65:14	66:7 66:21 67:1
grismore 5:19 5:19	45:10 60:15 95:8	hereby 170:5	65:17 65:18 66:20	67:4 67:10 67:18
<b>group</b> 3:4 42:24	95:13 99:9 99:13	hereunto 170:20	75:4 79:7 80:9	68:14 69:2 69:7
43:13	139:16	hers 158:25	hospitals 67:2 67:6	60:11 60:13 60:10
guard 53:21 53:24	hardness 31:22	hey 99:13 100:9	hot 20:23 21:5 21:22	69:22 70:5 70:11
55:21 57:5 57:25	hardwired 86:2	104:14	22:3 22:19 23:5	70:16 70:21 70:25
58:25 60:11 60:12	hartford 103:25	hi 35:11	23:22 23:25 24:1	72:15 72:23 72:25
85:23 92:15 150:23		high 20:23 20:24	25:20 26:1 32:2	73:7 73:22 74:2
guards 64:11	hash 130:8	21:5 21:21 21:22	35:10 35:19 35:25	74:7 74:11 75:2
guess 20:19 22:20	hasn 141:11 143:4	22:3 22:12 22:19	36:1 37:4 37:18	77:5 77:7 77:15
25:4 25:15 34:10	144:21 145:17	23:5 26:1 32:2 33:3		77:18 77:20 77:25
36:4 44:8 44:15	157:19 163:17	35:4 35:4 35:10	40:14 41:23 98:19	78.5 78.9 78.20
46:7 59:16 77:20	hate 10:15	35:16 35:17 35:19		80:19 81:4 81:10
85:15 88:2 89:20	haven 135:2	35:24 35:25 36:9	hotel 168:11	82:16 83:3 83:7
114:9	having 25:5 25:16	36:20 37:3 37:18	hottest 33:12	83:10 84:2

hundred 125:6	includes 57:4 81:7	156:14	50:10 50:11 86:17	introduction 4:13
<b>hurdle</b> 111:15	including 82:17	inspected 68:19	87:11 137:9 137:11	
	157:22	98:21 99:3 99:6	installers 3:17	introductions 3:9 8:
	inclusive 121:15	137:11	106:21	intrusive 29:18
idea 25:19 53:22	153:1	inspection 12:3 29:2	<u> </u>	involved 75:15 128:8
78:9 127:17	incomplete 117:1	29:9 29:16 29:18	instance 109:18	153:6 165:9
ideas 67:8 104:11	incorporate 105:5	29:20 29:24 30:2	instances 101:18	irony 146:19 147:19
identical 125:10	incorporated 72:13	42:2 47:12 67:15	109:19	isn 26:23 27:2 27:4
126:8 126:10	<b>incorrect</b> 30:15 89:3		<b>instead</b> 38:10 70:14	59:7 78:24 115:11
identified 24:4 87:13	07.10 72.10	78:11 82:14 87:4	94:1 117:11 146:16	
123:3 129:4 134:21	incorrectly 65:17	87:25 92:9 97:11	162:10	isolation 23:4
136:16 159:23	independent 104:1	97:11 97:15 98:1	instruction 53:15	issue 57:25 90:19
identify 32:10 68:5	155:11	98:7 98:7 98:9	<b>insurance</b> 2:5 19:11	100:6 125:8 135:1
71:19 120:7 133:4	indicating 8:15	98:13 100:16	103:6 103:12	<b>issued</b> 48:9 78:14
134:2 134:16	72:22 94:16	100:16 101:14	integral 25:22 77:12	
134:17	indicators 17:15	102:1 105:19 110:1	III   13   1.7   13   1.13	
identifying 79:12	32:25	113:12 113:19	155:7	73:12 100:10
79:12 135:19	individual 22:6	117:6 117:7 152:6	<b>intended</b> 24:16 25:10	
ii 3:9 124:1 124:2	27:22 27:24 29:9	152:8 158:18	39:14	italics 82:23
124:16 125:19	30:14 34:6 34:11	inspections 19:9	<b>intent</b> 37:20	item 8:22 9:3 9:6
126:12 127:9	34:15 44:17 53:19	149:13	<b>interest</b> 20:3 20:5	12:16 19:6 19:23
iii 3:10 138:5	55:16 63:19	inspector 2:16 4:18	38:14 43:6 84:18	19:25 20:3 20:4
ill 62:15	individuals 86:4	47:13 47:13 75:5	84:20 84:22	20:7 20:8 20:9
immediately 26:17	86:13	75:15 82:13 82:23	interested 48:14	20:10 20:13 23:11
55:9	industry 115:20	87:25 90:18 97:25	48:17 50:16 61:23	38:15 39:5 39:11
implementation	115:20 150:16	98:9 99:11 99:16	170:17	39:18 40:1 41:18
80:16	152:11 153:25	99:20 100:8 100:9 100:21 101:19	interesting 91:9	42:17 42:23 42:24
implemented 75:24	infinite 165:20	100:21 101:19	<b>interim</b> 3:11 9:7 19:0	
importance 93:16	information 13:25	101.23 102.21 105:17 105:18	19:17 47:12	73:18 84:12 84:12
<b>important</b> 9:3 14:21	16:20 16:24 21:8	109:13 109:14	interject 101:9	84:23 84:25 94:20
15:15 22:15	21:11 21:12 22:21	109:15 109:14	interlocks 154:25	95:4 95:5 95:17
impose 122:1 136:7	39:20 48:17 77:24	110:3 110:4 110:12	Internal 29:24 42:2	95:18 96:6 97:6
impossible 69:18	77:25 78:8 82:5	113:25 114:5 117:5	{ /2:4 9/:11 9/:12	97:7 98:6 105:6
<b>improve</b> 103:15	82:7 88:22 111:12	117:16 120:10	98:1 98:7 98:10	105:13 105:24
inc 2:12 3:4	111:14 118:4	127:11 166:8 170:9	101:14 104:7	106:5 107:20
inception 60:13	118:16 120:9	170:10	Internany 29:2 98:21	
inch 27:11 27:11	120:12 132:9	• 10.10	100:3 100:11	108:24 112:5
49:7	136:12 152:2 152:3	98:17 102:12 103:5	103:14	112:25 113:9
inches 27:10 29:4	157:13 157:16	103:6 115:2 115:19	international 3:3	115:11 116:24
73:4	157:24 166:12	115:22	6:11 20:10 20:15	117:23 119:22 119:23 130:7
inclined 29:1	informed 18:23	install 50:4 105:8	38:25	120 22 121 24
<b>include</b> 50:15 77:8	inherent 29:18	106:24 107:4	interpretation 134:8	130.23 131.24
77:22 83:5 109:14	inherently 27:18	107:16	134:9	147 10 150 10
124:13 125:24	initial 86:16 91:21	installation 44:11	interpretations 3:19	168:2
138:1	initially 52:16 75:18	79:4 106:23 145:5	3:20 168:16	items 3:15 4:11 8:13
included 21:10 45:23		145:10 149:12	interrupt 58:23	8:25 9:12 16:15
46:2 46:3 46:23	<b>input</b> 32:17 89:9	156:2 156:3	intervention 60:14	20:1 45:5 95:5
47:1 60:25 72:6	89:9	installations 159:23	intricate 32:5	itself 24:5 26:25 28:
75:10 77:17 157:15		<b>installed</b> 44:3 44:4	introduce 20:12	134:11 139:17
158:5	46:16 46:19 101:20		38:21 43:10 84:24	15 <del>7</del> .11 157.11

r	Г		T	
<b>iv</b> 3:11	joined 10:7	147:13 149:17	91:22 100:1 100:15	   laundry 153·21
ix 3:21	joint 13:13 13:21	151:11 152:22	102:23 103:2	167:12
	125:1	152:24 153:15	103:12 104:2 104:3	
J	jon 3:5 5:7 5:9 84:16		104:8 104:14	137:14 166:5
jacket 27:8	85:4 85:6 85:8 85:8		107:11 115:17	lay 70:6
jackson 2:14 6:15	86:10 104:15	157:16 157:18	119:8 121:24	layer 33:4 33:4
6:15 75:20 75:21	juliet 2:6	159:12 160:10	122:18 123:25	layers 33:6
78:12 78:13 78:23	july 7:11 7:19	160:13 160:15	124:12 128:7 128:8	
79:5 79:11 79:16	jump 111:15 134:24		130:20 139:20	ler 1:22 170:24
80:2 96:19 103:4	jumped 32:9 32:14		139:24 142:16	leader 52:23 56:5
103:8 103:16	jumps 139:17	K	147:5 147:5 149:17	63:13
111:20 115:17	june 10:9 10:11 13:2	keep 14:22 18:22	150:5 150:7 150:16	05.15
116:20 118:11	just 7:12 7:14 7:19	80:17 101:12	153:12 157:16	leads 96:8
121:18 121:21	7:21 8:5 8:21 11:4	keeping 13:10	157:17 159:18	
122:22 123:2		keeps 93:14	161:17 165:18	leak 27:1 27:1 27:20
123:11 123:19	11:10 11:14 15:25	kettles 132:6	167:3 168:10	learned 107:13
123:24 124:18	18:2 25:18 27:17 28:11 30:3 30:24	key 60:17 69:4	knowing 32:6	leased 151:1
126:23 127:1		kill 55:11	knowledge 15:19	least 16:25 73:17
127:10 127:20	33:17 34:22 35:2	<b>kim</b> 2:17 4:25 10:16	C	75:17 78:4 100:21
128:2 130:4 130:17	36:7 37:5 38:7 38:12 38:19 39:2	107:11 159:2	93:22	113:7 124:8 133:24
131:11 134:13	39:9 41:11 44:2	163:23	knowledgeable	153:2
139:9 139:13	48:17 48:25 49:8	kind 28:25 34:25	106:22 107:2 107:5	leave 60:20 83:1
143:16 143:19	49:19 50:16 50:22	63:21 65:20 71:16	107:16	100:18 106:7 106:8
143:24 149:21	53:8 54:2 54:10	73:2 89:25 93:11	knowledgeably	128:25 130:22
152:1 152:5 153:20	62:2 62:20 63:10	99:15 112:24	15:21	147:11 150:17
158:16 158:21	66:1 66:2 66:18	115:10 121:13	known 65:15 125:14	leaving 160:16
159:16 161:19	68:6 68:8 69:4	135:23 139:12	knows 65:18	<b>left</b> 6:24 8:8 90:13
161:22 162:22	69:15 69:21 71:2	157:15 160:5		legal 2:20 5:4
163:1 163:5 163:22	71:11 73:3 73:22	knew 7:11 104:22	L	<b>legislation</b> 3:18 16:2
164:3 164:8 164:12	74:5 74:9 75:24	knocking 145:14	<b>lab</b> 6:19	148:14 157:17
164:16 164:23	76:13 77:22 78:23	know 7:9 7:11 7:22	label 130:21	167:3 168:8
166:17 167:9	79:25 80:14 80:21	7:24 8:6 9:4 11:3	labor 1:1 3:22 5:22	legislative 12:25 16:4
167:17	81:3 81:6 81:12	11:14 13:7 14:8	6:16 11:9 12:2	legislatively 12:22
<b>james</b> 3:5 5:14 84:12	81:25 82:6 83:10	15:1 16:1 18:7	132:10 168:18	18:19
85:1 88:11	86:11 88:14 91:15	18:13 18:20 18:22	170:11	legislature 157:19
<b>jason</b> 5:21 12:16	91:18 91:25 92:21	26:1 29:2 30:18	laborious 68:4	length 151:14
12:19 16:17 19:2	92:25 93:4 94:3	31:13 31:18 31:23	lack 30:15	less 7:9
<b>jeff</b> 6:4 43:14	94:4 95:16 96:11	34:20 36:17 36:23	<b>lacon</b> 67:11	<b>let</b> 7:24 10:4 10:16
jefferson 2:17 4:25	99:22 100:17 101:2		ladies 20:10 167:25	11:14 15:25 28:10
4:25 10:16 11:3	101:8 101:12 103:5		landing 3:23	33:25 38:1 38:4
11:8 12:15 16:17	106:6 107:4 114:10		lane 2:3 2:12	68:19 69:9 70:2
17:3 17:12 82:4	118:19 121:12	56:16 56:17 58:5	laney 80:16 80:17	79:24 82:6 102:14
96:12 107:7 107:13		61:23 61:24 62:2	language 123:6	109:3 112:24
107:24 116:11	128:24 129:9	63:20 63:25 65:22	large 170:24	129:18 130:20
116:15 127:16	131:14 134:6	66:4 67:15 68:10	larger 53:14	135:24 135:25
137:24 157:12	136:17 137:3	69:4 70:2 70:3 71:3	largest 28:17	137:5 140:21
157:21	137:20 139:8 140:1		last 18:22 117:15	145:12 149:11
<b>jersey</b> 154:21	143:2 143:8 143:14		117:24 143:20	157:16 159:11
<b>job</b> 46:24 64:19	144:23 145:16	80:16 81:21 81:24	146:7	165:25
81:19 92:23 92:24	147:9 147:13	82:6 88:3 90:3	late 48:11	letter 106:3
93:4			1ate 40:11	level 28:2 73:4 73:6

	<u> </u>		Γ	
86:6 86:7 86:14	147:23 149:20	96:24 97:4 97:5	longer 44:11 108:18	<b>made</b> 9:16 9:16
86:15 93:9 102:12	149:24 156:9	105:4 106:25	148:23 151:24	11:16 23:13 29:8
103:13 120:5 139:5			lonox 50:7 50:9	39:18 41:25 48:9
•	166:23 168:11	112:2 112:2 123:10		
154:19 155:16				57:18 58:9 117:4
levels 72:18 155:15	likely 166:23	131:23 140:1	58:18 68:7 69:15	150:1 158:8 165:20
156:21	likes 17:11	147:10 147:11	69:16 73:19 80:8	167:2 167:11
liabilities 163:15	limited 40:12 63:8	147:15 155:12	100:10 122:11	168:25
liability 161:25	101:13	160:25 168:3 168:7		l
162:1 162:3	line 102:3	loaded 60:12	128:21 131:22	85:23 92:14
liberty 59:13	lined 142:14	local 114:24	137:25 146:24	mainly 156:20
license 118:8 119:12	lines 117:24	<b>located</b> 3:23 43:3	149:10 151:24	maintain 55:1
131:24 132:1	<b>list</b> 17:8 75:6 79:6	43:25 45:4 46:15	159:15 167:1 167:4	l
132:15 132:15	79:8 81:1 87:12	46:16 46:18 46:21	<b>looked</b> 100:3 102:23	166:5
132:17 133:2	96:3 151:15 152:13	70:22 84:15 124:11	153:13 156:14	maintains 60:4
133:15 133:16	152:15 152:18	<b>location</b> 45:16 49:16	<b>looking</b> 35:15 49:4	maintenance 5:7
133:17 133:25	159:3 159:5 163:24	60:21 66:16 68:16	55:14 61:16 62:13	44:18 53:2 58:10
134:22 136:3	164:4 167:12	70:8 71:2 79:13	68:15 72:19 81:14	71:23 71:25 85:6
136:15 136:16	listed 23:22 40:1	85:18 88:20 140:23	102:14 102:22	86:5 86:5 86:6
licensed 132:3 136:9		141:6 141:10	106:16 106:17	86:14
licensing 132:12	78:18 86:3 94:4	141:25 142:3 143:4	115:19 122:12	make 12:11 18:8
133:21 134:19	132:23 161:6	143:5 143:8 143:11	122:15 122:16	29:17 35:7 35:10
licensure 132:9	listen 104:14	143:15 143:17	123:22 127:10	35:11 36:1 37:8
132:22 133:23	listing 57:18	144:15 144:19	128:25 145:13	38:8 41:11 44:21
life 4:7 45:5 151:18	lists 81:2 153:21	144:20 145:16	146:16 149:19	47:13 47:14 49:1
light 46:6	literally 127:7	146:10 146:13	149:21	63:22 67:21 68:22
lightbulb 56:16	literature 36:16	locations 48:23 75:8	looks 60:8 95:10	69:5 71:12 73:17
lighter 7:9	36:18 39:20 40:16	88:15 126:24	loop 13:10	79:4 81:19 82:18
lights 51:12 51:13	litigation 151:13	141:14 143:21	lose 10:15 102:5	82:20 82:21 83:11
150:6	151:19	146:7	111:19	90:5 91:18 95:19
like 7:14 9:7 9:10	little 7:8 9:5 14:1	lochinvar 101:15	loses 110:25	95:20 101:19
10:17 11:19 14:19		lock 59:2	loss 151:18	111:18 114:6
16:24 17:21 20:18		locking 32:12	lost 85:17	122:19 127:5 130:1
		1 70 14 70 15	lot 4:8 10:22 14:16	133:22 134:6 134:8
21:2 21:18 25:13 31:16 48:3 56:20	97:2 104:19 107:12 114:15 130:2	72:20 74:18 74:21	65:23 98:19 98:25	135:12 137:20
		74:22 81:7 81:8	99:2 99:5 100:2	146:25 147:8
59:13 59:20 60:9	139:21 139:22	81:15 161:5 161:15		153:18 155:19
63:19 64:4 64:11	147:19 149:22	161:24 162:3 162:4		156:19 159:6 161:1
65:16 66:22 67:4	165:9	162:18 163:4 164:4		166:1
69:11 74:2 77:7	live 128:18	1.4 - 1 1		
77:10 77:16 82:17	<b>11</b> 4:10 4:11 4:13 4:14	166:10 167:11	142:18 147:8 160:6	33:7 68:6 82:14
82:18 82:20 82:22	8:24 10:4 10:22	167:16	love 153:22	105:9 121:13 161:2
86:8 93:8 93:12	13:9 15:1 16:19	logbook 72:7 72:9	low 26:21 27:16	making 72:3 93:15
95:21 96:10 100:20	10.10 10.10 10.22	logged 162:9 163:10	30:22 73:6 98:18	95:24 96:1 100:22
101:2 107:7 107:9	20:3 20:4 20:11	163:13 163:15		128:19
109:7 109:19 111:2			149:3 156:3 156:4	man 59:23
121:13 121:23	43:5 43:10 49:11	165:5 165:12	lower 31:14	
128:20 129:7	61:11 65:22 66:4	logic 32:21 69:15	lowest 125:17	management 86:23
129:10 136:13	70:5 76:16 79:19	logistics 62:14 165:8	lucky 88:8	manager 5:7 38:24
136:22 138:8	81:3 81:8 81:17	167:2		52:24 81:17 85:6
139:12 140:4	82:20 84:9 92:25	long 66:17 76:10		mandate 78:7 158:2
145:23 147:12	93:18 96:8 96:17	108:9 121:16	<b>ma</b> 165:23	163:18

mandates 156:10	marriage 170:17	150:18 150:25	7:17 9:9 12:5 16:10	<b>modes</b> 67:9
mandatory 135:13	massive 103:14	154:23 156:17	20:2	modified 148:12
157:11	master 22:7	158:17 160:17	members 4:8 12:21	modify 157:25
manhole 97:14 98:12		160:18 166:9	14:12 14:20 15:8	modifying 112:20
manifold 29:11	49:13 80:25 114:6	mean 21:15 24:19	15:12 16:5 18:8	moment 7:14 12:17
manned 85:22	114:11 137:21	30:18 36:17 58:23	18:12 82:11 95:23	39:2 146:3
manpower 62:14	137:23	59:7 62:2 66:12	96:3 116:9	monitor 44:20 45:3
62:14	matches 116:3	71:4 73:15 74:8	membership 8:18	55:16 58:4 60:1
manual 28:1 32:6	material 120:22	79:17 79:20 104:23		monitoring 32:4
44:14 45:15 45:19	122:17 124:2	108:2 108:7 114:22	memory 7:14	52:18 60:8 92:12
45:22 46:3 46:23	125:17 129:4	120:5 120:7 121:11	mention 64:17 158:8	
47:14 52:9 53:6	129:18	125:24 127:2	mentioned 47:21	155:8 157:1
56:12 57:18 62:18	materials 122:12	128:24 138:20	mentions 92:25	monitors 59:18
71:2 72:13 75:7	122:13 125:16	143:22 144:1	mess 123:21	month 108:9
80:18 81:8 81:15	129:12	145:22 146:10	methods 29:5	months 108:6 108:6
81:22 82:22 91:19	matter 79:24 146:19	149:16 156:8 167:7	might 14:12 33:17	more 12:16 15:19
91:22 93:19 127:1	167:18 167:19	167:10	34:14 71:6 159:14	17:17 29:18 31:3
manuals 153:22	170:18	meaning 16:4 68:18	military 115:10	31:18 41:6 46:7
manufacture 22:12	maximize 60:19	73:18	million 28:18 28:18	79:2 93:14 95:20
36:22	60:22	means 15:9 15:11	28:19 28:20	99:21 102:21
manufactured 20:22		25:8 97:11 98:7	milton 2:13	103:20 110:14
22:2 22:2 37:15	119:23	100:14 100:16	min 27:12	115:21 116:12
78:1	may 8:8 17:8 17:8	101:17 111:11	mind 8:21 14:22 36:3	
manufacturer 2:8	21:13 35:1 39:2	112:1 132:4 133:8	60:17 101:12	130:22 130:23
20:25 22:4 22:7	40:3 40:3 44:3	133:13 141:23	112:12 145:24	131:5 131:17
22:10 22:10 24:9	48:11 50:1 53:20	142:2 146:5 152:17	151:10 162:17	136:23 149:15
30:1 31:2 31:4	55:17 55:24 60:13	meant 97:9 97:18	mine 161:20	154:20 155:8
32:20 45:24 46:4	63:3 64:2 72:11	measures 17:16	minimal 153:18	159:13 160:19
85:9 108:18 109:13		164:25		morelock 2:2 4:2
109:24 110:1 110:9	l	mechanic 86:5 86:6	<b>minimum</b> 108:6 149:25	4:21 4:21 5:12 6:24
155:2	121:23 123:4	86:14 86:15	l	7:2 7:8 7:16 8:10
manufacturers 68:1		mechanical 49:5	minor 154:4	8:16 8:20 8:24 9:2
manufacturing	133:18 150:24	112:11 113:10	minute 4:11 44:9	9:14 9:17 9:19 9:2
92:12	151:6 155:13	113:16 113:17	44:13 51:2 55:14	9:23 10:1 10:7
many 11:5 27:10	156:17 165:8 167:3		61:17 64:8 64:12	10:21 12:10 12:15
36:17 36:17 48:20	maybe 58:3 61:1	114:23 115:3	72:20 84:7 152:12	17:24 18:2 18:17
62:1 62:2 102:13	62:6 69:3 69:4 71:2	445 66 466 4454	154:23 155:12	10 05 10 0 10 5
102:20 121:5	76:18 121:22 150:5	7 7 7 10 1 17 7	minutes 38:21 41:22	19:19 19:22 21:9
map 75:8	155:17 159:9	medikote 5:20	64:4 96:2 148:23	21:14 21:24 23:10
margin 122:15 129:3		meet 16:4 16:12	151:25 152:9	23:14 23:18 26:12
129:5 129:6 129:19		141:12 141:21	161:14 162:11	30:4 33:24 38:12
mark 5:2 5:16 11:21		meeting 1:8 3:21 4:4	162:21 165:13	38:17 39:1 40:6
38:19 38:23 73:4	48:2 59:8 62:15	10:12 11:4 12:11	103.21	40:10 41:1 41:8
109:22 110:11	63:10 65:22 68:19	14:14 19:24 104:7	miscued 69:4	41:17 42:3 42:5
131:12 150:5	69:9 77:7 79:5 88:3		missing 76:25	40.0 40.11 40.12
marked 86:23	97:21 106:9 109:3	168:16	misunderstand 59:8	42:16 42:20 43:9
market 103:20	109:6 114:9 121:21	meetings 18:3 18:5	mitigation 103:15	47:5 47:9 47:18
104:12	126:25 130:12	105:22 130:16	miura 102:18	52:11 54:20 54:23
marketplace 31:14	131:20 133:15	member 2:5 2:8 2:11	model 22:11 36:15	55:1 59:16 61:9
marks 56:19	135:25 137:5	2:14 6:21 6:23 7:10	37:24 39:7 40:17	61:12 65:3 65:7
marks 30.19	155.25 157.5		40:17 77:21	52.22 55.5 55.7

70:13 70:18 71:1	138:13 138:15	mr 4:17 4:23 5:2 5:6	52:22 52:23 54:4	77:6 77:7 77:10
74:15 75:17 76:12	138:19 138:23	5:8 5:14 5:16 5:18	54:22 54:25 55:3	77:15 77:16 77:18
78:3 78:6 78:10	139:7 139:11	5:19 5:21 5:23 5:25	55:4 56:2 56:6 56:8	77:19 77:20 77:23
78:17 78:21 78:25	140:14 140:17	6:2 6:4 6:6 6:8 6:11	56:10 56:15 56:24	77:25 78:2 78:5
79:10 79:14 79:19	140:20 141:7	6:15 6:17 6:18 6:20		78:9 78:12 78:13
80:1 80:3 80:7	141:16 142:4 142:8			78:20 78:23 79:5
80:14 80:21 81:5	142:12 142:20	10:19 11:1 11:3	57:14 57:16 57:22	79:11 79:16 79:22
81:12 82:12 82:25	143:1 143:7 143:13		57:23 58:7 58:8	80:2 80:5 80:16
83:4 83:8 83:14	143:18 143:22	12:20 16:23 17:6	58:12 58:14 58:15	80:17 80:19 81:4
83:17 83:20 83:22	144:1 144:14	18:14 18:19 19:4	58:17 58:20 58:21	81:10 82:16 83:3
83:25 84:5 84:11	144:22 145:4	19:8 20:17 21:9	59:9 59:12 60:18	83:7 83:10 84:2
84:21 87:19 87:23	145:21 146:2	21:19 21:25 23:17	61:10 61:14 61:18	84:4 84:19 84:22
88:6 88:9 91:10	146:18 146:23	23:21 23:24 24:3	61:19 61:21 62:4	85:1 85:3 85:5 85:7
91:15 91:25 92:4	147:10 147:25	24:8 24:14 24:18	62:6 62:8 62:11	86:11 87:9 87:21
92:21 93:6 93:11	149:7 149:11	24:20 24:22 24:24	62:12 62:22 63:3	88:11 88:13 88:14
93:15 93:20 94:6	149:15 151:12	25:3 25:7 25:15	63:5 63:7 63:13	88:21 88:23 88:24
94:9 94:13 94:15	152:7 152:21	25:18 25:24 26:3	63:25 64:6 64:7	89:3 89:5 89:7 89:8
94:17 94:20 94:24		26:8 26:11 26:14	64:12 64:14 64:19	89:10 89:11 89:13
95:2 95:15 96:14	157:20 158:20	26:18 27:19 27:21	64:24 65:6 65:9	89:14 89:16 89:18
96:18 97:1 99:18	159:11 159:17	28:10 28:13 28:14	65:11 65:20 65:24	89:20 89:22 89:23
100:12 101:2 101:5	159:22 160:4	28:15 28:24 29:6	66:1 66:7 66:8	90:2 90:3 90:10
101:10 101:22	160:21 160:25	30:6 30:11 30:21	66:10 66:12 66:14	90:12 90:13 90:15
102:7 104:25 105:3	161:4 161:21	30:23 32:3 32:15	66:17 66:19 66:21	90:17 90:20 90:22
106:10 106:13	167:25 168:14	32:23 32:24 33:1	66:24 67:1 67:3	91:1 91:3 91:5 91:7
106:19 107:22	169:1	33:16 33:20 33:25	67:4 67:8 67:10	91:24 92:3 92:16
108:2 108:12	morning 4:5 7:6 9:4	34:2 34:4 34:5 34:8	67:16 67:18 67:19	92:17 92:19 93:2
108:16 109:8	20:19 148:2 158:17	34:9 35:3 35:7	67:22 67:23 68:2	93:7 93:13 93:18
110:21 111:7	morristown 43:3	35:13 36:4 36:7	68:3 68:14 68:15	93:22 93:24 94:2
111:10 111:13	43:15 43:18 43:24	36:13 37:5 37:10	69:2 69:3 69:7 69:9	94:3 94:16 94:25
111:22 111:25	43:25 55:18 55:24	37:11 37:13 37:16	69:11 69:12 69:13	96:15 96:17 96:19
112:8 115:1 115:9	64:24	37:17 37:22 37:23	69:14 69:19 69:20	96:25 98:16 99:22
115:16 116:2 116:6	most 22:14 30:9	38:1 38:3 38:4 38:6	69:22 69:25 70:5	100:25 101:4 101:8
116:14 116:19	30:19 33:14 37:17	38:7 38:23 40:5	70:7 70:11 70:12	101:11 102:6
116:22 117:21	80:15 115:18 129:6	40:8 40:25 41:2	70:16 70:19 70:21	102:10 102:18
118:18 118:22	166:23	41:13 41:14 41:25	70:23 70:25 71:5	102:19 103:4 103:7
119:2 119:7 119:11		42:18 43:12 43:14	71:8 71:9 71:10	103:8 103:10
119:21 121:17	23:15 41:18 41:25	43:17 43:20 47:8	71:13 71:14 71:18	103:11 103:16
121:25 122:5	47:6 47:10 47:16	47:17 47:21 47:23	72:6 72:8 72:10	103:17 106:12
122:10 122:14	87:20 87:21 87:24	47:24 48:1 48:5	72:11 72:12 72:15	106:16 106:20
122:24 124:5	168:23	48:7 48:11 48:13	72:19 72:21 72:23	107:9 107:15
124:16 124:25	mount 2:6	48:22 48:24 48:25	72:24 72:25 73:1	111:20 115:17
125:4 125:7 125:23		49:11 49:14 49:16	73:7 73:8 73:10	116:20 118:11
126:3 126:7 126:16	move 41:25 60:22	49:18 49:21 49:22	73:12 73:22 73:24	121:18 121:21
127:23 128:5	95:12 101:7 107:25	49:24 50:2 50:6	74:2 74:5 74:7 74:9	
128:23 129:11	142:20 165:1 166:3	50:8 50:12 50:14	74:11 74:14 74:17	123:11 123:19
129:17 129:25	168:7	50:16 50:20 50:21	75:1 75:2 75:3	123:24 124:10
130:6 130:11	moved 47:8 144:18	50:22 50:24 51:1	75:12 75:19 75:20	124:18 124:24
130:19 131:1 131:3	146:12	51:3 51:11 51:15	75:21 75:22 75:24	125:3 125:6 126:22
131:8 131:16	moving 3:16 19:5	51:17 51:19 51:20	76:1 76:2 76:4 76:6	
131:21 134:12	19:25 20:8	51:24 52:2 52:4	76:9 76:10 76:15	127:5 127:8 127:10
136:25 137:5 138:3	}	52:5 52:8 52:21	76:22 76:24 77:5	127:12 127:18

	·			
127.20 127.21	161.22 161.24	160.22 161.19	100.10 101.10	19:6 42:23 55:22
127:20 127:21 127:25 128:2 128:4	161:22 161:24 162:22 162:25	160:23 161:18 162:17 163:14	100:10 101:19 102:11 114:6	84:11 95:4 96:2
127:23 128:2 128:2 128:2 128:2	163:1 163:3 163:5	167:5 170:20	114:10 114:11	101:7 105:6 107:22
128:11 128:14	163:6 163:22 164:1			124:21 128:22
130:4 130:17 131:6			118:3 118:14 118:18 120:10	154:8 156:2 167:14
130:4 130:17 131:0	164:10 164:12	myself 18:4	120:25 131:5	168:16
131:11 131:13	164:15 164:16	N	131:17 133:15	nfpa 28:7
134:13 134:15	164:19 164:23	name 35:11 38:23	133:16 133:17	mpa 28.7 nice 78:11 167:11
134:23 135:17	164:24 165:3 165:7		134:8 137:20	167:12
135:21 135:23	165:11 165:14	named 31:4 68:24	142:25 144:4 150:1	
135:25 136:5 136:6	1	nameu 31.4 08.24 nameplate 110:11	150:21 152:2 152:4	nine 10:10 10:13
136:10 136:19	166:6 166:14	110:15 110:25	153:16 158:24	
136:20 137:2	166:17 166:22	110.13 110.23	161:15	80:23 92:4
137:20 137:2	167:2 167:6 167:9	names 81:2	needed 109:11	nobody 108:3
138:14 138:17	167:17 167:18		112:17 112:18	noncongruent 51:6
138:22 139:1 139:4	1	nashville 3:23		noncritical 46:8
138.22 139.1 139.2	ms 4:19 4:25 5:4	<b>national</b> 6:19 100:13	155:25 148:14	none 3:12 19:22
139:20 140:4	6:10 6:13 7:7 11:3	112:19 114:7		38:17 38:18 43:9
140:13 140:16		116:12 116:18	needing 36:8 130:23	150.0
140:13 140:16	11:8 11:25 12:15	117:18 119:16	165:6	noninclusive 152:14
141:19 142:6 142:9		132:22 134:25	needs 74:13 80:8	nonstandard 119:24
142:19 142:0 142:5		135:15 137:15	92:6 99:10 99:16	122:1 122:25
	96:12 96:19 107:7	139:4 148:13	99:20 102:21	127:13
143:2 143:10	107:13 107:24	natural 7:25	102:23 103:3	nonvote 94:23
143:16 143:19	116:11 116:15	nature 22:13 59:3	134:20 143:3	nonvoting 94:18
143:24 144:11	118:12 118:21	navy 115:11	150:13 153:1 153:2	nor 115:4
144:16 144:17 144:23 144:25	118:24 119:5 119:9	110.11111111	154:1	normal 56:20 162:13
	123:5 127:16	117:18 119:14	neil 2:14 6:15 83:12	normally 67:24
145:2 145:3 145:6 145:8 145:9 145:12		119:17 138:5	96:13 166:9	103:11
145:18 145:20	145:10 157:12 157:21 166:4	148:24 149:6	never 36:25 37:14	notary 170:4 170:24
		<b>nb369</b> 114:4 114:11	37:20 37:20 135:16	<b>note</b> 7:9 20:5 125:11
145:25 146:11	166:11 166:19	116:3 116:7 116:9	neville 3:5 5:14 5:14	125:13 129:3
146:21 147:7	167:14	<b>nbic</b> 29:5 110:14	5:15 84:12 85:1	noted 42:6
147:20 149:5 149:9		110:20 117:11	85:1 85:2 85:7 87:9	<b>nothing</b> 58:6 60:1
149:14 149:18 149:21 149:24	35:24 36:10 37:12	117:13 132:22	88:13 88:23 89:3	73:21 73:25 101:18
	39:2 39:24 84:3	133:21 135:8	89:7 89:10 89:13	149:7 152:19
151:21 152:1 152:3 152:5 152:19		135:11 136:19	89:16 89:22 90:2	152:22 155:7
152:3 152:19	123:21 154:25	137:19 138:5 152:5		163:16 163:17
152:22 153:17	multiplier 124:13	166:2	115:8	163:20
153:20 153:24	must 42:1 106:2	nearby 61:4	new 3:13 19:25 20:9	<b>notice</b> 53:17
154:5 155:14	129:4	necessarily 99:7	44:12 45:25 49:20	novel 59:7
156:18 156:18	<b>my</b> 10:19 36:8 36:23	130.22 1 13.17	51:6 51:12 69:24	<b>november</b> 14:8 14:9
156:20 156:23	38:23 39:25 59:11	165:12	78:15 78:18 79:4	18:3 18:6
158:4 158:7 158:10	59:17 68:22 69:5	necessary 17:20	79:21 79:25 80:4	now 8:13 23:19 29:2
158:12 158:13	70.1 75.15 100.25	117:17 133:9	80:5 80:10 84:1	20.2 20.10 47.10
158:15 158:16	101:21 104:3	164:13	85:8 87:6 91:4 91:6	53:11 55:4 55:9
158:16 158:21	112:12 114:9 115:7	need 7:24 8:14 16:18		56:24 68:8 71:18
158:16 158:21 159:5 159:16	120:15 126:18	21:15 42:22 60:24	104:16 105:25	73:2 78:7 86:8 88:9
159:30 160:2 160:8	150.5 151.0 155.0	61:10 65:24 74:12	144:15 154:21	88:17 89:8 90:7
160:23 161:2	157.21 157.22	80:22 80:24 89:16	155:7	90:19 100:12 103:4
160:23 161:2	151:10 153:8	90:10 91:18 96:24	newer 144:12	103:14 103:18
101.1/101.17	154:15 155:10		next 3:21 7:23 9:6	
	l .			

1				
106:15 107:3	74:11 86:23 86:23	123:4 124:9 125:2	114:1 137:9 148:8	17:7 17:21 18:16
107:24 109:21	96:22 104:19 130:9		149:1 154:24 157:9	
110:8 110:24	150:4	135:1 135:9 140:12		32:14 32:20 33:7
112:23 114:4 115:9		143:23 144:5 144:6		33:8 35:22 38:2
115:18 120:20	office 3:22 6:14 13:4		163:8 163:16	38:5 38:8 40:13
128:20 131:21	15:4 65:14 92:13	154:10 154:11	163:18 163:19	47:2 51:10 57:19
135:14 135:25	92:20		operational 154:10	62:15 63:24 64:9
136:7 136:9 137:22		161:23 162:4 163:3	1 -	74:22 75:15 79:6
138:11 138:20	often 12:23 31:18	163:4 163:7 163:8	operations 13:14	82:19 82:24 83:12
138:23 138:24	oftentimes 14:16	163:9 163:9 163:10		87:1 87:2 94:5
140:21 141:21	15:19 17:6	164:20 167:7	operator 3:18 51:22	99:23 100:1 101:13
146:2 147:13 150:9			55:6 60:20 150:23	101:25 102:1
nowhere 57:20	46:1 48:6 50:11	59:24 68:10 128:17		102:14 102:20
nuclear 115:19	51:4 76:17 88:15	ongoing 87:4 93:12	operators 45:2 46:25	
115:20	88:17 90:23 91:7	139:6 139:8 139:10		110:24 116:8 116:9
nuisance 32:11	115:21	onus 101:23	35:22 39:4 39:5	117:12 118:14
number 19:9 19:13	older 44:4 129:12	open 3:15 8:13 8:21	130:13 167:5	119:17 130:8
33:17 60:19 60:22	once 47:13 98:23	15:11 72:3 95:4	opportunity 20:18	135:11 135:24
63:8 65:2 66:23	128:14 147:24	99:8 99:9 99:13	42:19	136:17 138:4 140:7
67:1 69:17 69:24		100:4 100:24	opposed 9:21 42:11	143:9 145:14
70:1 70:8 77:21	154:19 162:11	100:4 100:24	73:20 83:20 94:13	145:15 146:4 146:8
77:22 77:22 88:12	164:24 164:25 one 4:7 12:16 13:24	130:12 130:15	146:25	147:2 147:3 147:6
88:12 88:12 88:25		130:12 130:13	opposite 101:16	147:11 147:12
90:8 90:9 90:16	14:11 14:13 15:15	148:3 150:17		157:10 159:5
90:23 92:7 92:10	16:17 16:23 16:25	150:17 151:4	<b>opposition</b> 105:4	165:10 167:12
93:24 102:3 112:4	17:9 22:1 22:22 26:21 27:13 29:7	152:23	114:12 <b>optimistically</b> 167:5	outcome 170:18
/3.47 104.3 114.7	I /n:/I //:In/9:/ I	132.23	i amilmisiiraily la /:3:	
113.14 113.20		onened 99:12 100:5		
113:14 113:20 114:15 120:7	31:5 34:22 34:25	opened 99:12 100:5	options 110:22	outer 27:8
114:15 120:7	31:5 34:22 34:25 35:2 38:14 44:2	102:24	options 110:22 orange 148:19	outer 27:8 outlet 33:2
114:15 120:7 129:10 147:21	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1	102:24 <b>opening</b> 23:19 47:19	options 110:22 orange 148:19 order 3:8 4:4 26:8	outer 27:8 outlet 33:2 outlines 113:3
114:15 120:7 129:10 147:21 <b>numbers</b> 40:19	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10	102:24 <b>opening</b> 23:19 47:19 88:10 97:15 98:13	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14
114:15 120:7 129:10 147:21 <b>numbers</b> 40:19 68:20 68:21 69:16	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12	102:24 <b>opening</b> 23:19 47:19 88:10 97:15 98:13 156:13	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12
114:15 120:7 129:10 147:21 <b>numbers</b> 40:19	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20	102:24 <b>opening</b> 23:19 47:19 88:10 97:15 98:13 156:13 <b>operate</b> 24:21 33:19	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5
114:15 120:7 129:10 147:21 <b>numbers</b> 40:19 68:20 68:21 69:16	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1
114:15 120:7 129:10 147:21 <b>numbers</b> 40:19 68:20 68:21 69:16 <b>nurses</b> 70:15	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13 154:13 155:11	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13 154:13 155:11 operated 50:25 51:2	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13 154:13 155:11 operated 50:25 51:2 148:22	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13 154:13 155:11 operated 50:25 51:2 148:22 operates 60:3	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:16	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12 originally 65:12	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13 154:13 155:11 operated 50:25 51:2 148:22 operates 60:3 operating 44:12 45:23 45:24 56:20 62:9 85:11 92:8 113:23 127:22 133:10 140:10	options 110:22 orange 148:19 order 3:8 4:4 26:8     39:13 88:4 96:7     113:3 118:4 119:12     120:12 155:20 organization 43:19     82:1 organizational 81:1     81:17 81:20 81:22 original 108:18     109:23 110:9     110:16 140:23     141:5 141:14     141:24 146:12 originally 65:12     88:16 147:21	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22  133:10 140:10  154:4 155:17	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12 originally 65:12 88:16 147:21 147:21	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24 31:21	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4 105:6 108:14	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22  133:10 140:10  154:4 155:17  161:25 163:7	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12 originally 65:12 88:16 147:21 147:21 osweeo 69:1	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20 135:19 144:19
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:16 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24 31:21 occurred 12:14	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4 105:6 108:14 110:17 113:7 113:8	102:24 opening 23:19 47:19 88:10 97:15 98:13 156:13 operate 24:21 33:19 39:20 42:25 56:4 57:8 64:8 84:13 154:13 155:11 operated 50:25 51:2 148:22 operates 60:3 operating 44:12 45:23 45:24 56:20 62:9 85:11 92:8 113:23 127:22 133:10 140:10 154:4 155:17 161:25 163:7 operation 13:21	options 110:22 orange 148:19 order 3:8 4:4 26:8     39:13 88:4 96:7     113:3 118:4 119:12     120:12 155:20 organization 43:19     82:1 organizational 81:1     81:17 81:20 81:22 original 108:18     109:23 110:9     110:16 140:23     141:5 141:14     141:24 146:12 originally 65:12     88:16 147:21     147:21 osweeo 69:1 others 54:3 84:23	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20 135:19 144:19 151:10
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O  oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24 31:21 occurred 12:14 130:10	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4 105:6 108:14 110:17 113:7 113:8 113:11 114:22	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22  133:10 140:10  154:4 155:17  161:25 163:7  operation 13:21  24:16 25:10 30:8	options 110:22 orange 148:19 order 3:8 4:4 26:8     39:13 88:4 96:7     113:3 118:4 119:12     120:12 155:20 organization 43:19     82:1 organizational 81:1     81:17 81:20 81:22 original 108:18     109:23 110:9     110:16 140:23     141:5 141:14     141:24 146:12 originally 65:12     88:16 147:21     147:21 osweeo 69:1 others 54:3 84:23     115:8	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20 135:19 144:19 151:10 owner 2:2 2:11 38:24
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O  oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24 31:21 occurred 12:14 130:10 od 27:11	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4 105:6 108:14 110:17 113:7 113:8 113:11 114:22 114:23 117:22	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22  133:10 140:10  154:4 155:17  161:25 163:7  operation 13:21  24:16 25:10 30:8  30:13 39:15 44:3	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12 originally 65:12 88:16 147:21 147:21 osweeo 69:1 others 54:3 84:23 115:8 ours 22:16 27:8	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20 135:19 144:19 151:10 owner 2:2 2:11 38:24 109:12 120:10
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15  O oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24 31:21 occurred 12:14 130:10 od 27:11 off 12:13 73:4 73:13	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4 105:6 108:14 110:17 113:7 113:8 113:11 114:22 114:23 117:22 118:14 118:19	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22  133:10 140:10  154:4 155:17  161:25 163:7  operation 13:21  24:16 25:10 30:8  30:13 39:15 44:3  52:17 113:12	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12 originally 65:12 88:16 147:21 147:21 osweeo 69:1 others 54:3 84:23 115:8 ours 22:16 27:8 31:18	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20 135:19 144:19 151:10 owner 2:2 2:11 38:24 109:12 120:10 143:6 148:7 148:11
114:15 120:7 129:10 147:21 numbers 40:19 68:20 68:21 69:16 nurses 70:15 O  oak 6:18 158:17 objecting 108:3 objection 168:3 observed 84:10 86:22 obtain 131:25 obtained 44:7 132:10 obviously 13:8 41:4 136:3 154:7 occur 26:10 26:24 31:21 occurred 12:14 130:10 od 27:11	31:5 34:22 34:25 35:2 38:14 44:2 46:15 46:21 48:1 48:5 48:12 50:10 51:4 52:15 53:12 53:13 53:14 53:20 55:18 55:25 56:13 60:3 60:11 61:15 62:10 63:22 66:3 67:10 67:12 68:5 68:24 68:24 72:24 72:25 73:13 76:12 76:19 78:24 85:18 85:20 88:17 90:18 90:20 91:8 94:17 95:15 96:10 97:3 98:16 101:7 101:16 102:10 104:8 105:4 105:6 108:14 110:17 113:7 113:8 113:11 114:22 114:23 117:22	102:24  opening 23:19 47:19  88:10 97:15 98:13  156:13  operate 24:21 33:19  39:20 42:25 56:4  57:8 64:8 84:13  154:13 155:11  operated 50:25 51:2  148:22  operates 60:3  operating 44:12  45:23 45:24 56:20  62:9 85:11 92:8  113:23 127:22  133:10 140:10  154:4 155:17  161:25 163:7  operation 13:21  24:16 25:10 30:8  30:13 39:15 44:3	options 110:22 orange 148:19 order 3:8 4:4 26:8 39:13 88:4 96:7 113:3 118:4 119:12 120:12 155:20 organization 43:19 82:1 organizational 81:1 81:17 81:20 81:22 original 108:18 109:23 110:9 110:16 140:23 141:5 141:14 141:24 146:12 originally 65:12 88:16 147:21 147:21 osweeo 69:1 others 54:3 84:23 115:8 ours 22:16 27:8	outer 27:8 outlet 33:2 outlines 113:3 output 25:12 28:14 89:12 outside 8:3 33:5 46:22 60:20 82:1 104:6 over 12:21 13:15 15:1 32:7 66:3 90:24 103:9 104:15 114:15 131:9 131:15 137:16 143:19 150:15 overall 156:21 oversight 13:1 14:2 own 24:7 24:9 36:8 87:16 129:20 135:19 144:19 151:10 owner 2:2 2:11 38:24 109:12 120:10

150:25 151:8	85:25 86:2 133:18	patients 46:19	80:19 81:23 118:6	plugged 73:11
159:21 159:23	paper 68:25 129:22	pattern 33:5	132:4 154:3	<b>plugs</b> 99:9
159:24 160:5	paperwork 22:18	pause 7:15	<b>personnel</b> 8:1 52:16	plumbing 63:21
160:10 160:10	41:3 41:6	paying 13:9	54:7 54:14 56:17	plus 112:15 112:22
160:12 160:13	paragraph 43:22	pbx 45:2 45:4 45:4	62:21 63:9 63:10	113:10 113:17
160:13 160:15	55:22 66:5	45:16 45:18 46:10	63:14 64:9 64:10	113:21 114:17
160:16 160:16	paragraphs 116:9	46:25 51:9 51:11	85:24	114:19 114:21
160:20 160:22	118:10	51:21 51:21 54:8	perspective 110:7	pmb 1:24
owners 3:17	parallel 34:7 34:12	55:6 55:6 59:23	<b>pertinent</b> 68:5 68:10	
ownership 44:7	paraphrasing 39:9	60:20 65:10 65:19	<b>pg</b> 39:13 120:17	31:24 33:15 33:23
140:24 141:2	parenthetical 132:15		120:18 123:7 123:8	
141:11 141:11	parking 4:8 10:22	71:2 71:3 71:6	126:8	73:13 76:7 77:3
141:15 141:25	parks 8:4	pedigree 120:23	<b>phone</b> 65:13	89:25 101:18
142:3 142:5 143:5	parkway 1:23	peer 102:8	phrase 109:13	106:25 107:19
143:8 143:12	park 12:25 13:3	penalize 125:2	physical 22:23 60:14	l l
143:25 144:21	14:12 14:23 14:24	penalty 124:18	physics 26:19	166:8 167:22
145:14 145:17	15:3 15:25 17:19	pencil 166:25	picadilly 2:3	points 32:18
145:18 146:4 146:8	17:23 25:22 25:24	pennsylvania 142:15		poll 18:8
146:14 147:12	30:8 38:24 40:4	people 53:25 56:2	picked 125:21	pollution 50:3
151:2 151:8	44:14 46:2 49:2	60:19 60:22 64:23	168:11	pool 116:21
oxygen 31:25	53:7 53:11 63:15	71:3 103:9 128:16	piece 68:24 90:4	poor 85:15
	64:22 77:12 112:20		162:4 166:15	portland 128:9
P	125:19 126:12	149:10 158:3	<b>pipe</b> 33:9 33:10	ports 99:8
<b>p3</b> 23:21 24:9 40:12	127:9 127:25 138:5			1 -
<b>p7</b> 40:12	138:13 138:14	137:18 157:7 166:2	piping 22:25 23:2	<b>position</b> 106:6
pa 165:23	145:14 145:15			115:25
package 22:8 22:9	149:8 149:12	percent 36:21 125:6	I	possibility 63:11
22:24	149:12 149:15	perfect 31:16 31:17	place 8:2 8:3 14:4	possible 15:15 26:22
page 3:2 36:20 48:4	149:16 151:1	104:24	40:9 72:2 75:14	27:20 33:12 100:15
52:14 52:15 53:18	159:21	perform 86:21	76:11 82:9 93:2	110:13 118:5
55:14 57:7 65:1	participate 96:20	124:11 124:12	122:23 155:1	120:12
66:5 70:11 76:21	particular 16:20	performance 17:15	161:10	possibly 49:2 96:7
80:22 92:11 92:13	17:20 20:3 24:4	performed 19:15	places 59:11	post 85:23 92:14
97:7 98:5 105:6	25:22 26:6 35:21	47:15 58:10 71:17	<b>plain</b> 58:16	potential 18:3
105:7 105:24	36:12 37:6 48:16	performing 118:7	<b>plan</b> 48:19 51:3	potentially 81:24
107:23 108:12	66:16 76:19 77:3	performs 136:8	85:14 92:1 110:13	<b>pounds</b> 28:11
108:24 112:4	150:19	perhaps 73:17	plant 45:20 53:25	<b>power</b> 3:3 5:17 20:9
116:24 119:22	particularly 156:6	117:24 124:8 155:6	l	20:15 20:21 21:2
123:5 125:7 126:17	parties 170:16	<b>period</b> 13:23 67:13	<b>plaque</b> 11:25	38:25 39:19 41:21
130:24 131:3 131:6	partnership 118:7	117:8 117:19	plate 125:13	85:12 148:19 154:8
131:11 131:13	132:4	119:15	plates 97:14 97:15	157:9 161:7 161:12
131:15 131:23		periods 148:22	98:12 98:12	powerpoint 17:5
132:2 137:4 137:7	parts 109:11	peripheral 155:3	playing 63:9	17:19
137:25 147:18	pass 15:9 47:8 68:13	permission 105.0	<b>plays</b> 143:12	practicable 100:14
148:17 150:21	76:3 76:6	105:24 117:5	<b>plc</b> 32:16 32:17	100:17
pages 141:1	passage 16:13	<b>permit</b> 50:5 105:16	32:19 32:20	practical 86:19
<b>pain</b> 99:1	passed 7:10 7:18	<b>permits</b> 105:19	<b>please</b> 10:3 20:5	practice 100:14
paint 157:5	past 61:23 66:9	permitted 62:19	20:11 38:22 130:13	
panel 45:3 45:5 45:9	66:12 75:4 88:16	permitting 50:3	130:20	preamble 39:12
70:17 70:22 71:7	pasted 83:10	<b>person</b> 16:18 44:20	<b>pleasure</b> 10:18 10:20	
10.11 10.22 11.1	patience 4:7	54:7 59:4 60:15	<b>plug</b> 29:13 29:15	preapproved 105:17

predominantly	137:8 137:12	21:12 21:17 21:21	pumps 155:20	<b>questions</b> 16:16 17:8
156:25	137:17 137:18	22:1 22:1 22:13	purchased 109:12	17:11 17:25 19:20
prefer 73:16	137:17 137:18	28:4 35:9 35:9	purple 98:5 106:5	21:11 23:20 26:13
premier 12:4	138:2 141:22	36:16 36:18 125:5	purpose 25:11 26:3	30:5 52:12 76:23
preparation 16:22	141:23 142:1 142:2		1	82:3 87:17 133:14
1	146:5 146:6 156:3	professional 71:23	purposes 88:19	quick 91:16
preparedness 50:23	156:4 156:7 163:16		pursuant 148:12	quite 15:15 32:22
prerequisite 15:24	pressures 39:15	75:25 79:12 87:5		36:23 49:9 82:5
<b>presence</b> 96:19	39:22 72:17	programmer 51:5	149:6	162:15 162:18
109:25	pretty 15:9 39:24	51:5	push 103:14 166:21	164:10
present 10:17 11:24	59:19 95:21 107:5	- '-	put 15:8 53:12 66:1	104.10
14:14 16:11 16:15	160:5	programmers 51:7	71:2 74:5 74:9	R
20:13 21:15 21:16	prevalent 110:14	51:9	88:21 90:24 93:10	raising 15:7
28:9 43:11 84:13	-	prolong 140:12	96:4 100:15 110:7	
84:25 85:8 137:22	prevent 46:19	<b>proper</b> 106:23 135:4	1	1
142:9	preventative 71:25	<b>properly</b> 21:4 90:6	129:21 142:5 143:8	7
presentation 17:4	previous 7:10 7:17	properties 120:6	144:13 152:13	randolph 5:25 5:25
17:5 17:19 17:23	9:8 44:6 47:22	121:8 121:9 123:23		range 28:19 28:20
18:9 20:6 84:6	47:25 79:1 111:1	126:15	159:12 160:14	34:17 39:22
presented 12:3	previously 50:18	property 151:17	165:10	rare 30:24 34:2
presenting 3:5	118:14	proposal 15:20	puts 123:13	rate 31:6 31:6 31:7
presently 90:21	price 103:21	<b>proposed</b> 15:1 98:4	<b>putting</b> 101:23 102:2	
136:21 137:3 137:4		98:6 106:4 109:21	140:9 157:14	rates 157:1
152:20	<b>prior</b> 58:8 68:23	111:23 114:3	157:24	rather 34:22 114:13
<b>preset</b> 27:25 67:25	154:15	148:18	Q	120:16 140:7
president 5:15	private 65:12	<b>proposing</b> 45:8 47:1		140:11 160:15
<b>pressure</b> 24:12 24:16	_	74:23	qc 19:15	rating 148:20
25:6 25:9 25:10	<b>pro</b> 165:7	proposition 77:1	qualifications 140:8	
25:11 26:25 27:7	proactive 167:20	protection 27:19	140:10 150:24	12:11 12:17 15:7
39:23 40:3 42:25	probable 26:16	27:23 34:11	<b>qualified</b> 44:21 53:19	
43:22 44:2 77:12	<b>probably</b> 8:18 22:14	<b>prove</b> 110:25	55:15 55:23 148:4	35:3 36:10 36:13
84:14 97:13 98:2	53:1 116:16 116:16	<u> </u>		37:2 38:9 39:25
98:11 98:18 99:5	121:19 139:3 140:3		148:15 148:25	40:23 42:21 42:21
99:7 101:12 101:20		25:25 36:20 52:24	160:12 160:19	43:20 47:1 51:15
105:14 106:1	<b>problem</b> 30:9 73:7	103:13 113:3 120:5		51:25 52:2 52:8
106:22 106:24	108:10 134:24	136:1	119:12	54:10 54:13 55:5
108:19 108:23	135:1 149:22	<b>provided</b> 22:21 48:2	quality 36:20 36:21	55:8 56:19 59:24
108:25 109:24	<b>problems</b> 53:24 54:2		quarterly 1:8	60:9 60:18 60:21
113:12 113:13	66:9 66:12 100:5	82:5 120:9 133:11	question 16:18 26:19	
113:19 113:19	159:4	provides 59:1	27:21 28:24 29:7	62:15 62:20 71:24
113:22 113:22	<b>proceed</b> 7:23 112:2	provisions 137:13	33:1 42:9 59:17	72:1 72:2 74:23
113:24 113:25	proceedings 7:15	proximity 32:24	83:18 94:10 97:8	78:18 78:25 79:23
114:1 117:8 119:24	107.5 170.0	<b>psi</b> 24:17 24:21 25:11	97:18 106:6 120:13	
122:25 125:9 132:6	<b>process</b> 13:3 85:13	40:13 41:5 125:15	122:6 128:21	82:25 83:8 84:7
132:12 132:13	96:1 102:8 105:19	<b>psig</b> 39:16 39:23	131:24 133:6	85:11 87:13 88:8
132:13 132:19	110:8 111:18	<b>public</b> 46:18 170:4	135:22 136:6 141:4	
133:4 133:5 133:9	146:15	170:24	141:13 146:10	92:1 93:17 95:14
133:13 134:1 134:3	produce 26:9	<b>pull</b> 104:13 164:17	150:15 150:25	95:25 96:2 96:5
134:4 134:11	produced 53:4	166:12	151:10 152:23	96:10 97:1 98:4
134:22 135:4 135:5	producing 25:12	pump 30:7 30:12	153:7 162:24	101:6 103:4 103:5
136:16 136:24	<b>product</b> 20:21 21:3	31:6 31:9 31:20	163:14 166:4	104:8 104:12

	Г	T	T	
106:20 107:11	97:19 97:20 99:11	reference 45:23 46:3	135:15	138:6 138:25
107:16 108:5 109:9		106:3 138:8 138:12	I	138:25
112:25 121:6	100:24 100:24	149:5 159:7	remote 22:5 23:7	replace 10:8
122:14 123:22	101:24 101:25	references 95:9	24:2 24:3 24:18	replaced 44:10 78:20
124:13 126:6 128:9		149:10	26:2 28:5 31:8	78:21
128:17 130:14	122:17	referred 117:13	I	
130:22 131:22	reasonably 97:12		31:22 37:24 59:18	replacement 109:11
134:7 134:17	97:23 97:23 98:8	130:18	60:7 85:19 85:20	110:5 110:15
134:21 135:19	99:10 99:15 100:7	referring 112:16	85:22 85:24 86:1	110:16
136:21 138:7	102:24	112:19	92:11 92:13	reply 35:13 36:10
142:12 143:6 144:7		refresher 87:7	remove 29:13 29:15	report 3:11 9:7 9:11
		regarding 37:18	142:14	19:7 19:18 22:4
144:13 146:3 146:3	l	regardless 51:24	removed 29:21 29:23	
146:9 146:15	recall 66:15	52:4 52:5 100:11	91:8 97:16 98:13	59:1 110:2 161:13
147:13 149:9	receive 42:1 52:17	149:1 161:9	140:22 141:5	162:15 162:19
149:16 149:19	57:8 82:9	reginald 5:25	141:13 141:23	reporter 4:15 5:10
149:22 150:3 151:5	1 received 1 1.0	register 111:3	renew 79:21	38:20 43:16 82:7
151:6 151:18 153:9	10001111 11.2 70.13	registered 110:20	renewal 48:14 48:15	- '-
155:11 155:20	95:16	registration 111:1	75:25 76:11 76:20	<b>reporting</b> 1:23 4:16
157:4 157:11 159:3	f receitifications	137:16	78:16 79:3 79:4	represent 43:18
159:12 163:1 163:6	128:12	reglassed 142:15	79:9 91:18	representative 2:2
163:22 163:24	recess 84:10	regular 15:11 37:1	renewed 48:7 76:7	2:5 2:11 14:18
166:17 167:20	reclassify 141:1	71:22	rental 49:7 50:17	15:14 17:20
167:21 167:22	recognition 9:8	regularly 105:21	50:18 50:24 144:18	representatives
167:23	104:10	regulation 15:18	144:19 145:1	17:10
read 35:22 64:21	recognize 26:16	154:21	reorganization 3:16	representing 43:15
91:22 95:11 98:3	32:13 135:9	regulations 11:12	95:5 95:19	reputation 31:15
101:1 106:4 109:1	recognizes 29:5	43:22 170:12	repair 66:13 69:23	request 20:19 21:9
109:2 109:3 109:21	recognizing 33:12	regulator 149:2	102:2 113:23	23:15 63:17 84:13
117:3 120:16	recommend 30:1	149:3	117:16 118:8	99:12 105:7 142:22
120:21 121:1	30:2	reinstall 105:24	119:14 132:1 132:5	requested 12:16 44:7
130:15 146:4	recommendation	108:8 108:9	132:14 132:15	96:20 131:25
146:25 148:19	13.22 114.9 158.2	l	132:18 132:24	requesting 43:21
149:16 160:2 168:5	recommendations	106:1 141:2	133:1 133:2 133:7	106:24 134:21
readable 92:2	148:13 148:24	reinstalled 105:10	133:8 133:12	requests 42:24
reader 152:16	149:6	105:16 141:22	133:13 133:15	142:18
reading 33:14 36:9	recommended 83:6	141:24 146:11	133:17 133:19	require 41:21 112:21
39:4 71:14 118:6	159:16	146:13 146:16	134:5 134:10	116:12 116:18
readings 34:17	record 12:14 38:19	relate 37:7 133:5	134:17 134:18	133:1 158:2 161:5
reads 97:10 117:9	56:20 130:10	134:3	134:20 134:20	162:7 162:8 162:9
132:2	163:18	related 35:23 170:15	124.22 126.14	162:12 163:20
real 17:17 26:18 99:1	recorded 53:16		126.15 126.17	164:6
103:14 108:15	72:17	relatively 27:14 29:8	136:24 137:3	required 66:13 99:4
realigning 3:17	red 15:7 118:16	29:20	137:22 138:11	132:9 132:17 134:1
realistically 165:17	119:3 138:5 138:20	released 13:6	repaired 67:14 72:5	136:13
reality 31:17 73:5	140:18		repairers 132:3	requirement 20:20
reapproved 48:16		relief 23:6 28:4 28:5	repairs 44:21 111:15	24:7 43:1 50:9 77:2
reason 35:1 40:11	redesign 129:24	relieve 23:6	117:3 117:10	112:19 134:19
55:10 61:22 103:19	reduce 103:18	relocate 90:5	132:19 132:24	155:12 161:6 161:9
129:19 156:1	redundancy 34.8	remainder 106:3	133.5 133.22 134.3	
reasonable 97:9	34:10 34:18	remember 7:19 54:6	137:17 137:18	50:7 84:14 92:23
	redundant 34:20	123:16 124:7		
I	I			

93:10 112:9 112:18	restamp 110:10	119:10 119:21	127:21 127:25	106:15 117:13
113:9 114:5 114:6	111:6	122:14 122:20	128:4 128:7 128:11	120:5 125:8 127:24
115:14 120:4	restamped 109:23	126:16 128:23	134:23 135:21	128:6 132:12 133:4
154:17 155:4	restamping 108:22	129:25 130:7	135:25 136:6	133:7 134:2 135:19
164:21	108:25	130:19 130:21	136:19 139:4	138:10 141:1
requires 28:1 116:13		131:17 135:21	139:20 140:13	148:11 153:5
132:22 136:15	55:12 62:19 62:25	136:20 141:21	144:25 145:3 145:6	157:14 157:18
152:6 163:4 163:21	63:1	143:17 144:22	145:9 145:18	159:16 166:3
requiring 31:15	restore 133:9 138:2	150:8 151:12	149:14 153:17	ruling 31:9 39:18
rerate 129:22	restriction 136:8	152:21 157:20	156:18 158:4	run 62:23 96:22
reset 28:2 32:6 62:17	restrictive 129:6	158:20 165:14	158:10 158:13	running 165:22
62:17	result 21:1 26:25	<b>rim</b> 129:13	159:8 164:19	runs 164:20
resistence 31:25	results 13:6 34:16	<b>ring</b> 67:12	164:24 165:7	rupture 27:6 27:13
resolution 85:14	resurrect 140:1	river 2:12	165:14 165:17	27:14
85:17 135:2	retired 6:12 10:8	riveted 128:2	166:6 166:14	rush 103:18
respect 45:16 61:25	retirement 10:14	<b>rm7800</b> 51:5	166:22 168:25	<del></del> .
respond 54:19 62:16		road 2:9 139:3	robust 31:3	S
63:2 85:25 93:1	return 110:18	<b>roane</b> 75:4	<b>roles</b> 86:13	sacrifice 165:24
109:3	rev 82:19 82:21 83:2	robert 64:3 88:4	<b>room</b> 45:16 45:18	saddle 59:11
responder 59:14	review 15:1 19:15	<b>robinson</b> 2:5 6:20	46:14 46:16 46:17	safe 8:2 8:3 27:18
responders 61:7	25:16 98:1 98:9	6:20 9:16 23:17	46:17 46:22 48:20	133:10 138:2
responding 109:9	102:8 143:21 159:9	26:14 27:19 28:10	48:21 49:5 56:18	155:23
response 7:1 8:9 9:1	reviewed 20:25	28:14 28:24 32:24	60:23 70:9 87:15	safest 33:14 126:20
9:13 9:20 9:22 9:25		33:16 33:25 34:4	87:16 88:17 134:7	safeties 28:8 28:23
18:1 19:1 19:21	reviews 153:21	34:8 41:14 41:25	134:9 150:6 150:12	safety 23:9 28:3
38:16 41:16 42:7	revise 73:2 74:1	47:17 57:10 57:13	168:19	30:16 32:5 32:8
42:10 42:12 42:15	revision 78:24 82:17	57:16 57:23 58:8	rooms 85:18	32:12 32:22 33:15
43:8 53:9 54:12	105:1	58:14 58:17 58:21	rosa 8:4	45:5 73:25 120:1
59:15 80:13 83:16	revisions 82:18 82:19	65:9 65:20 66:1	roughly 27:10 28:18	120:3 120:5 120:9
83:19 83:21 83:24	95:24	66:8 66:12 66:17	routine 71:24	121:4 121:6 121:7
91:14 94:8 94:12	reword 120:16	67:8 67:16 67:19	routinely 142:14	121:10 121:13
94:14 94:19 97:21	rhone 6:13 6:13	67:23 68:3 68:15	<b>rule</b> 3:16 3:19 3:20	121:24 122:13
105:2 105:15 108:1	11.25 79.18 96.19	69:3 69:9 69:12	14:25 15:20 15:24	122:20 123:13
109:4 109:4 111:24	119:9 144:9 145:10	69:14 69:20 69:25	16:6 21:6 21:23	123:17 124:22
112:13 117:1	166:4 166:11	70:7 70:12 70:19	35:20 39:9 40:22	129:2 135:8 154:25
117:20 118:1	166:19 167:14	70:23 71:8 71:10	40:22 41:19 43:2	167:21
119:20 120:8 132:8	<b>rid</b> 99:1 118:19	71:14 72:6 72:10	44:9 44:13 51:2	said 16:18 40:15
132:21 133:3	ridge 6:19 158:17	72:12 72:21 72:24	61:17 64:9 64:13	57:17 58:10 64:4
133:25 140:25	<b>right</b> 9:2 10:1 10:9	73:1 73:8 73:12	95:6 95:19 95:25	91:21 95:25 120:15
148:9 160:3 161:11	18:18 19:8 36:3	73:24 74:5 74:9	96:1 147:18 147:19	
162:13 162:16	37:10 46:18 52:15	74:14 75:24 76:2	147:21 147:22	147:12 156:24
162:19 169:3	54.22 55.3 57.6	76:6 76:22 87:21 100:25 101:4 101:8	147:24 148:1 152:12 154:23	157:7 165:21
responsibilities 59:6	66:15 68:20 70:4	100:25 101:4 101:8	160:9 161:8 161:8	sales 38:24
responsibility 44:25	71:5 71:9 77:6 78:6	101:11 102:6	163:9 168:15	sam 2:16 4:17 11:20
45:3 99:19	79:10 88:9 92:17	102:18 103:11 103:17 106:12	rules 1:2 1:9 3:16	11:23 111:16 128:7
responsible 44:17	93:6 93:7 96:23	103:17 106:12 124:10 124:24	3:17 3:21 4:4 12:6	142:16 145:19
63:14 72:2 80:16	101:3 103:14	125:3 125:6 126:22	I	147:5 150:19
100:22 117:7 151:7	103:18 106:10	123.3 123.6 120.22	16:1 35:14 43:22	same 16:1 21:2 37:8
rest 10:5 89:25	107:2 110:24 116:6	127.3 127.3 127.8	88:4 105:22 106:3	50:10 60:9 63:20
120:18	118:23 118:24	121.12 121.10	00.4 103.22 100.3	64:17 81:2 81:23

103:21 104:4	160:11	138:5 139:12 157:8	separately 38:8	sheets 161:5
117:23 125:8 131:4	scale 31:21	159:15	<b>separator</b> 22:5 23:8	shell 125:12
141:24 142:23	scan 157:1 157:1	security 7:25 53:21	24:2 24:4 24:10	<b>shift</b> 47:2 62:10
142:24 144:2	schedule 62:23	53:24 54:14 55:21	24:19 28:2 28:6	71:20
144:15 146:13	<b>scheduled</b> 3:21 13:2	56:16 57:5 57:25	31:8 37:24	shifts 47:4
146:19 146:23	105:21	58:25 59:1 60:11	september 1:10	<b>ship</b> 115:6
153:4 163:7 163:15	scheduling 63:14	60:12 60:24 61:4	10:12 170:13	<b>shipley</b> 6:17 6:17
sandra 6:10	63:15	64:11 85:23 92:14	170:21	shop 144:4
satisfactory 116:4	schematic 22:25 40:1	92:20	serial 68:21 69:16	<b>short</b> 62:16 62:20
133:10	45:19	see 17:21 18:8 31:18		97:2
satisfies 21:17	schematics 45:20	48:21 49:6 49:6	serves 31:23	shortly 124:3
satisfy 102:9 113:8	school 112:14 112:21	54:11 56:19 60:10	service 23:5 50:1	shoulders 100:9
115:13 138:20	113:10 113:15	60:23 67:24 67:24	50:19 59:2 98:20	show 14:18 14:21
140:21 142:5	113:20 114:19	73:6 76:19 81:23	105:10 110:18	21:16 70:8 76:22
152:11	114:24 115:12	82:10 83:12 87:2	117:7 136:1 136:1	89:9 89:11 128:9
saw 65:22	scrapped 108:20	88:6 92:23 94:4	151:15 152:6 152:8	
say 10:17 18:3 30:19		96:8 98:4 98:20	157:6	showed 22:25 23:1
37:13 38:18 40:11	screen 164:16	101:20 103:22	services 3:4 6:3	showed 22:23 23:1 showing 15:16 16:25
49:5 52:14 52:16	sd 48:19 49:4 49:20	105:12 107:1	42:24 43:13 64:16	45:19 45:20 48:22
56:20 58:19 59:25	70:12 70:12	109:16 119:10	64:18	70:9
73:3 73:19 74:19	seamlessly 15:10	120:19 137:6 138:3		<b>shown</b> 49:20 112:23
79:3 79:21 79:25	second 9:17 9:18	138:5 140:1 141:16		shown 49:20 112:23 shows 22:23 49:1
80:10 81:15 94:10	22:24 23:16 23:17	148:17 149:12	28:12 32:18 33:23	62:14 70:14 79:8
99:13 100:9 101:24	42:4 44:19 46:21	150:3 156:9 157:4	51:12 51:13 127:24	
102:14 102:25	47:16 47:17 47:19	161:23 168:21	128:6 136:18	shut 44:23 46:5
104:14 108:21	68:23 88:1 114:23	<b>seeing</b> 73:16 104:12	136:21 150:9	46:10 46:15 51:22
123:3 123:21 136:8	116:25 117:9	<b>seeking</b> 33:18 39:25	150:11 151:23	51:25 52:2 54:9
136:17 136:22	131:15	40:24 104:8	153:7 170:20	55:7 55:10 55:11
142:13 143:14	seconded 88:5	seen 76:15 76:17	setting 124:23	97:14 98:11
144:24 145:12	secondhand 141:8	103:12 104:14	140:23 141:6	shutdown 51:16 52:9
148:12 150:18	141:9 141:18 142:1	sell 37:21	141:14 141:24	54:15 70:17 70:22
152:24 160:8 160:9	142:23 143:15	semantics 143:2	146:12	71:7 86:1
166:20	145:15 146:5	<b>send</b> 116:8 142:15	seven 33:4 33:6	shutting 46:20
<b>saying</b> 37:6 51:16	146:17	142:22 150:11	86:12 86:15	sick 63:17 168:13
69:7 99:19 137:22	secretary 2:22 4:20	senior 56:6 64:16	shake 11:5	168:15
151:19 155:15	15:4	64:18	<b>shall</b> 106:22 107:4	side 8:4 23:2 26:22
156:13 159:2	section 21:5 22:3	sense 30:15 122:19	110:3 113:6 117:4	28:9 28:23 29:8
165:12 165:15	22:17 23:5 24:10	161:2 165:4	117:10 117:17	29:16 29:20 29:24
says 12:1 36:19 39:5	24:12 39:12 65:25	sensor 33:9 33:10	118:8 119:13 120:9	104:13 136:24
58:18 71:2 92:11	80:24 81:13 117:24	22.27	123:21 137:9	siemens 140:5
92:13 93:4 98:6	118:13 118:15	sent 17:7 21:8 48:6	148:22	sight 150:4
107:4 110:16 113:5	118:17 118:19	sentence 116:25	<b>shalt</b> 137:18	sights 155:22
117:15 125:11	119:18 120:15	117:1 117:9 117:15	<b>sharp</b> 116:1	sign 117:17
125:13 133:8	120:17 123:7 123:7		sheet 48:6 72:15	signal 2:9
133:24 133:25		separate 24:5 26:10	75:11 77:8 77:11	signals 45:9
135:7 137:3 137:8	125:18 125:19	35:8 51:10 51:12	82:18 87:1 88:22	signature 102:3
137:17 138:1 140:1	125:24 126:1 126:3		l	0
141:10 141:22	126:9 126:12	154:16 161:15	161:25 162:3 162:4	signed 110:1 110:5
146:12 148:4	126:13 126:13	163:2	162:18 163:4 164:4	silence 7:14 112:1
150:13 150:19	127:8 127:9 137:13	separated 136:17	165:6 166:24	similar 20:24 22:9
151:23 160:10		_		22:13 34:16 34:24
L			l	

37:25 40:18 122:25	something 14:22	<b>spoken</b> 157:19	<b>station</b> 70:15 85:19	stressing 142:13
124:9 125:9	58:4 59:10 59:14	sponsored 16:2	85:21 85:22 85:24	strike 118:25 119:1
simple 29:21 147:2	61:3 65:22 71:3	square 44:1 148:21	165:23	119:3 119:10
simply 27:4 29:16	73:16 88:5 95:10	stack 155:18	stay 12:11 12:12	119:17
since 27:5 31:19 32:4	101:9 103:2 107:12		42:21 106:14	stringent 116:20
44:3 44:9 44:11	107:18 108:8 111:2		106:14	structure 81:22
50:17 51:4 51:6	114:13 121:14	133:1	stayed 88:14	struggle 57:10 57:16
51:8 76:12 77:11	129:7 135:12	<b>stamped</b> 41:9 110:5	stays 78:14 106:12	struggled 134:25
95:25 106:20	142:21 143:20	137:11	steam 23:9 23:23	struggling 134:23
132:18 134:21	147:23 150:5	stamping 110:6	23:25 23:25 24:15	stuff 60:5 99:25
136:14 146:7	150:18 150:20	110:16 137:15	24:25 25:4 25:8	139:17 140:9
sir 8:16 12:19 23:21	157:7 160:17	stamps 110:10	25:11 25:20 26:4	163:24
50:2 50:14 50:20	167:15 167:20	standard 28:7	26:9 27:1 28:5	subcommittee 13:22
66:7 67:18 69:25	167:23	162:12	28:11 36:20 36:21	<b>subject</b> 21:6 21:23
70:16 73:24 74:17	sometime 154:8	standards 137:7	40:9 49:1 98:18	39:9 117:8
sit 107:17	sometimes 14:17	<b>standby</b> 154:10	99:5 99:7 103:25	submitted 15:3
site 46:13 47:14	54:4 68:6	standing 72:20 169:2	132:6 132:6 132:7	succession 69:16
48:19 70:8 72:18	somewhat 34:20	standpoint 30:7	156:3 156:5 156:7	sufficient 15:19
73:5 73:10 74:3	154:22	30:22 75:16 98:20	163:16	suggest 105:25 129:
74:12 75:6 75:8	somewhere 147:4	stands 65:11 143:3	steaming 31:7	suggested 153:16
80:20 85:14 92:1	164:17	start 4:9 4:14 54:24	steel 102:16 129:14	153:19 157:8
143:17 166:7	<b>soon</b> 18:7 18:14	56:5 86:12 97:2	steels 125:22	157:24 159:6
sites 142:21	18:16	131:23 157:24	step 107:2	163:12 164:25
sitting 151:5 167:22	<b>sorry</b> 36:5 43:16	158:13 159:1	steve 5:23 6:18 85:3	suggestion 126:18
<b>situation</b> 7:21 22:16	57:14 58:23 65:2	started 57:20 59:20	86:8	134:14 153:18
six 112:15 112:22	68:11	66:5 76:14 82:17	steven 5:8	158:1 165:20
size 27:14 28:8 28:19		<b>starting</b> 44:18 98:6	still 42:1 61:23 80:8	suggestions 152:16
28:20 82:22 156:8	107:7 107:9 155:10	<b>starts</b> 131:9	99:16 104:24 110:9	
sizes 28:16	sound 121:13 155:21	state 1:1 1:8 2:18	110:10 114:14	159:13 166:1
skeptical 157:15	<b>sounds</b> 25:13	2:20 2:22 3:17	128:14 143:6 144:7	suggests 112:20
skid 22:8	spanking 91:5	13:18 15:4 19:10	149:19 151:17	suite 1:24
<b>skill</b> 93:9	speak 5:11 5:12	40:20 79:7 80:22	151:18 157:4 163:6	sunset 12:25 13:2
skills 93:23	15:21 52:21 75:1	103:5 110:23 111:2	163:15 166:21	13:4 13:12 13:13
slash 53:21 55:21	139:24	111:3 111:4 111:9	stipulations 76:20	13:15 14:7 14:23
58:25 67:20 160:22		122:8 132:10	stone 1:23 4:16	15:16 17:12
slide 129:18	<b>special</b> 11:13 110:23	132:11 132:19	stop 54:17 54:24	superceded 80:10
small 26:25 27:15	111:3 111:9 122:8	135:20 136:14	55:7 55:10 56:5	<b>superior</b> 49:21 49:22
27:20 97:2 116:21	specialized 63:21	136:18 137:9	59:24 60:2	68:17
smallest 28:16	<b>specific</b> 14:6 17:8	139:14 139:18	stopping 44:18	supervised 45:11
smyrna 84:16 85:10	17:11 35:14 56:3	142:18 147:6	stored 26:23 27:2	supervisor 6:14
<b>sold</b> 37:23	92:23 134:10 156:1	148:15 166:7 170:2		92:12
<b>solutions</b> 6:7 6:9	156:11	170:5 170:24	stories 10:4	<b>supply</b> 2:12 4:24
somebody 62:15	specifically 36:19	<b>stated</b> 43:20 46:4	<b>story</b> 164:9	136:12
63:20 63:23 64:2	121:3 129:21	140:25	<b>strength</b> 121:9 121:9	<b>support</b> 102:25
82:1 100:22 104:13	132:19 134:17	<b>statement</b> 58:9 107:6		107:1
104:20 122:7	specs 122:18		stress 60:16 67:11	supporting 14:20
150:11 150:18	spelled 81:2	statements 41:12	125:17	supposed 124:13
165:22 166:24	spelling 117:11	states 25:8 39:13	stresses 124:15	sure 17:17 18:15
someone 54:19 62:24	spent 148:1	62:18 105:23	124:23 126:14	36:1 38:1 38:3 38:
62:25 72:16 108:7	<b>split</b> 67:20	stating 129:22	129:23	38:8 47:14 49:1

63:22 66:14 69:5	146:4 146:7 146:8	<b>temp</b> 35:11	122:20 128:18	theoretical 86:18
72:3 81:19 89:22	147:11 168:3 168:4	1	terms 59:21	thereafter 124:3
90:2 90:6 91:19	taken 67:14 135:3	temperature 20:23	test 53:7 72:12 73:16	therefore 31:21
93:15 96:14 111:18		20:24 21:5 21:21	tested 75:9	32:21 34:15 99:2
112:14 114:6	takes 40:9 100:23	21:22 22:3 22:12	testimony 13:20	161:14
128:13 133:22	116:21 119:22	22:19 23:5 26:1	testing 71:16 71:21	thermal 25:12 35:6
134:6 134:8 139:6	131:20	27:23 27:25 30:14	136:11	35:7 35:11 35:18
140:4 142:19	taking 14:4 35:25	32:2 32:3 32:4 32:9	tests 60:4 136:11	35:23 36:11 36:14
165:16 167:11	38:20 72:2 77:13	32:11 32:18 32:25	text 81:20 98:5	36:16 36:23 36:24
surface 148:21	107:1	33:3 33:12 33:14	105:12 106:4	36:25 37:7 37:15
154:17	<b>tale</b> 104:16	33:17 33:18 33:21	109:16 114:3	37:21 100:16
surfaces 29:25 29:25	talk 8:19 135:1 135:9	34:16 34:22 34:23	120:19 138:9	thermocouple 27:23
97:13 98:2 98:10	talked 7:20 54:5 77:1	35:4 35:5 35:10	thank 4:6 7:7 7:16	32:17 33:9 34:3
surprise 9:4 9:5	150:2	35:16 35:17 35:19	10:19 11:1 11:1	thermocouples 32:10
surprised 134:24	talking 35:3 35:5	35:24 35:25 36:9	11:7 12:7 12:8	34:1
swinging 155:21	36:11 36:14 37:2	37:3 37:18 38:10	12:20 19:2 19:4	they 4:10 13:24
<b>switch</b> 154:19	38:9 57:20 103:5	39:6 39:8 39:14	19:8 19:19 20:17	13:25 14:1 14:3
sydne 2:19 5:4 95:8	103:6 108:6 119:5	40:14 41:23 137:12		14:25 15:4 15:7
95:25 96:4 114:10	121:6 139:2	155:18	42:18 42:18 42:20	15:8 15:9 15:10
<b>symbol</b> 119:6 119:8	talks 93:3 123:17	temperatures 39:16	42:22 84:2 84:4	15:11 16:12 17:18
119:15 119:18	137:15	39:21 125:15	84:5 94:25 95:2	22:11 31:9 32:6
symbols 118:15	tank 23:8 24:2 24:4	154:18 156:21	95:12	33:2 34:13 35:15
118:19	24:11 26:6 28:2	temporary 145:5	thanking 95:8	35:17 37:2 37:19
system 25:9 25:23	28:6 49:17 50:9	ten 67:3 124:4	thanks 167:24	37:23 47:3 47:13
25:25 32:6 32:8	73:14	<b>tends</b> 14:19	thanksgiving 168:21	49:11 49:12 51:22
32:10 32:13 45:6	tanks 132:6	tennessee 1:1 1:8	their 22:11 31:9	51:23 51:25 52:2
45:8 45:10 45:11	tca 118:13	1:24 2:3 2:6 2:9	36:16 36:18 37:20	52:6 52:8 52:9
45:25 46:1 46:2	team 52:23 56:5	2:13 2:18 2:20 2:22		52:19 53:7 54:9
46:9 55:25 65:13	63:13 86:23	3:16 4:3 5:21 6:16	60:20 72:1 75:9	54:10 54:11 54:17
77:12 87:11 93:25	tear 28:25 144:11	9:9 11:9 12:1 12:5	75:10 88:15 104:1	55:8 56:5 56:10
98:22 98:23 98:25	tech 54:21 55:24	16:8 21:4 35:14	104:2 109:4 110:10	56:17 56:17 56:19
154:5 155:8 156:25		43:25 50:4 53:15	115:24 115:25	56:20 56:22 56:25
systems 55:18 87:10	00.000.707.21	68:21 69:15 79:7	139:25 153:22	57:7 59:24 60:9
91:8 140:6	63:4 63:6 67:20	84:16 85:10 90:9	153:22 158:10	60:21 61:2 62:12
·	104:19 104:20	90:16 92:6 92:10	158:17 165:20	63:17 63:25 64:1
T	technical 103:1	105:11 106:2 111:2		64:2 64:22 71:24
<b>t92</b> 69:14	technically 24:11	111:17 118:9	31:15 34:5 34:19	71:24 71:25 72:1
<b>t92639</b> 69:17	technician 44:16	132:10 136:2	34:25 36:17 53:6	72:2 72:4 75:5
table 8:12 20:11	44:25 55:23 56:14	137:10 139:14	53:9 59:21 60:24	75:10 78:18 80:3
61:25 80:24 81:14	64:16	139:18 142:22	66:15 67:10 76:18	80:10 80:25 85:11
89:19 96:10 126:12		154:22 170:2 170:5		85:24 86:10 86:13
164:19 165:25	53:14 71:21	170:10	115:20 115:24	87:13 92:25 93:4
tag 90:24 91:1 91:9	technology 113:17	tensile 121:8 123:23	115:25 141:18	93:16 93:17 103:13
take 8:1 30:7 38:2	114:17	125:12 125:14	142:15 142:15	103:25 104:1
38:4 38:7 49:12	techs 58:16 61:20	126:14	142:16 153:6	104:18 106:24
62:12 62:12 75:14	62:1 62:5 62:6 62:9	4 (5.10 (5.10	153:21 153:22	107:4 108:8 108:9
84:7 93:25 97:7	tell 10:5 49:18 86:8	70:24 99:16 100:13		109:9 110:9 110:10
113:1 115:7 124:18		100:14 160:6	164:18 167:11	111:12 115:5
126:19 128:21	104:16 111:4 118:24 153:20	terminology 57:13	themselves 14:20	115:22 115:25
140:8 140:11 143:8		57:17 58:3 120:3	102:13	121:6 121:23
1.5.51.6.111.5.6	telling 158:17		102.10	122:18 123:22

125:21 126:6 126:9	157:12 157:22	31:20 42:22 50:10	52:19 52:25 53:8	152:9 154:9 155:2
126:14 127:23	158:24 159:6 159:8	62:13 63:17 66:3	53:11 56:4 56:11	163:1 163:8
128:5 128:8 128:12	160:6 164:19 165:4	67:13 72:3 75:21	56:23 57:1 57:3	<b>type</b> 30:10 46:11
135:2 135:8 135:9	<b>thinking</b> 63:8 65:23	75:22 77:3 87:4	57:8 74:18 74:21	89:2 93:25 102:17
135:11 139:24	69:5 123:12 130:5	95:1 99:1 103:21	74:22 75:7 75:11	155:7 157:5 157:18
140:15 144:3 144:4	146:14 155:10	105:20 106:25	81:7 86:9 86:16	types 102:22 163:8
144:7 145:12 150:3	155:15 158:8	107:19 121:16	86:18 86:18 86:19	typical 27:9
150:19 151:6	<b>third</b> 61:3 154:10	121:23 122:4	86:25 87:6 87:8	typically 33:20
151:16 151:17	thou 137:17	124:21 128:8	91:17 91:18 91:20	typo 92:5
153:9 153:21	thought 64:21 71:10	139:15 141:17	91:21 91:23 102:12	
155:20 156:3 156:4	94:4 107:21 160:24		103:1 103:22	U
156:5 157:11 163:1	165:5	145:11 153:23	103:23 104:1 104:6	ug 126:7
163:3 164:17	thoughts 17:14	154:23 167:4	140:5	ultimate 125:12
164:17 165:20	145:25 147:14	times 14:16 31:7	transcript 170:8	unacceptable 98:15
165:21 166:17	149:20 165:6	31:10 99:3 99:6	transfer 27:9 30:16	uncorrected 19:14
166:21 167:10	three 34:24 44:15	tireless 12:5	transmit 45:8	under 24:6 28:12
thicker 31:5	48:3 48:8 48:22	title 59:13	travel 45:17	35:10 35:20 40:21
thin 102:17	56:2 62:4 62:6 62:9	<b>titled</b> 48:19	treatment 31:16	40:22 41:7 41:20
thing 37:8 60:9 68:3	66:20 66:21 75:25	titles 80:24 81:13	31:17 67:17	43:1 44:6 44:12
71:11 88:3 104:4	76:11 82:8 84:13	81:19 81:24	treatments 156:25	44:24 50:6 51:2
126:20 140:7	85:11 86:4 87:12	tn 3:23	trouble 53:22 53:22	58:24 59:11 59:15
149:17 153:4	88:16 108:6 112:9	today 7:4 11:4 11:13	59:4 112:6 151:13	61:16 64:8 64:12
things 10:17 11:6	113:8 113:8 113:21		true 37:22 64:17	64:15 66:22 74:17
12:22 17:21 17:22	115:12 154:1 154:7	54:6 85:7 88:7	77:13 103:10	77:8 77:20 84:14
38:13 59:3 65:23	154:9 154:13 155:2	95:18 96:8 138:5	103:16 116:11	88:25 89:8 90:7
95:16 102:10	threw 70:23	138:16 138:18	136:5 145:8 170:7	97:9 97:10 106:5
104:16 152:9	thrilled 13:25	150:2 166:25	truly 34:10	106:21 112:9
153:11 167:8	through 15:10 18:6	together 53:12 88:22		119:23 125:13
think 22:14 31:11	20:1 21:12 27:3	157:25 165:19	trying 25:18 60:18	129:9 133:8 133:19
48:12 54:4 58:1	32:16 33:6 34:15	top 49:8 55:14 60:17		134:4 137:2 137:3
58:22 60:5 62:4	53:5 53:6 68:4	105:7	151:6	138:11 148:17
64:3 65:24 66:5	68:16 73:3 86:20	tosha 168:18	ts 125:11	160:9 161:7 161:8
67:11 70:1 71:5	86:21 96:11 109:17		tube 27:8 89:4 89:7	163:9 163:9
76:19 97:4 97:22	110:8 110:22 111:1	67:1	102:15 102:16	undergoing 60:16
99:10 99:16 99:20	118:25 119:1 119:3		102:17 104:19	underneath 50:8
100:8 102:8 107:10	119:10 129:18	touch 73:18	tubing 29:3 125:1	106:18
107:15 107:18	129:21 130:8 141:1	touching 163:23	tune 41:5	understand 15:2
109:19 115:2	146:15 168:5	trace 2:6	turn 33:8	21:20 38:9 46:5
121:12 121:15	throughout 63:16	trade 35:11 114:24	twice 125:2	46:7 59:9 64:1
122:19 122:24	104:21	154:5	two 16:14 19:15	91:24 93:16 100:9
123:15 127:15	throughs 156:23	<b>traded</b> 104:19	27:10 29:4 42:25	141:19 149:18
127:16 128:17	throw 59:14 100:1	train 23:1 135:14	44:1 46:14 49:19	162:16 162:19
130:14 130:20	throwing 68:6 99:23		51:6 57:24 61:1	165:8
131:19 136:25	tickled 7:5	trained 44:16 44:20	66:20 66:20 73:14	understanding 36:3
138:22 139:2	tied 61:2 65:13	52:8 52:20 53:3	81:23 82:8 85:17	88:20 90:23 149:23
139:18 140:7	162:22	53:18 54:9 54:10	88:17 103:12	understands 152:16
140:11 143:10	tighter 14:1	54:21 55:15 55:23	108:10 113:17	understood 44:10
143:11 144:9	time 11:4 11:15	74:20 74:25 75:7	114:17 114:20	160:5
145:14 145:23	16:20 16:21 18:5	75:10 86:15 115:21		underwriter 155:3
147:13 153:17	18:12 18:21 19:16	training 52:16 52:17	118:13 144.4 144.4	unfired 24:7 24:12
153:25 154:1	10.12 10.21 17.10	J. W. 111112 J. 2.10 J. 2.17	110.10 111.111.	

24:13 24:15 24:25	150:11 150:25	vacation 63:17 63:24	73:7 73:8 73:12	110:25 113:22
25:4 25:6 25:8 25:9	151:9 151:9 151:20	vacations 62:13	75:13 75:14 76:13	117:8 129:23
25:9 40:3 43:21	151:23 152:23	<b>vague</b> 160:18	76:15 76:17 77:1	132:12 132:13
137:8	153:6 153:7 153:13	vagueness 160:6	80:14 82:18 82:20	132:14 132:19
unique 22:4 22:6	155:19 156:1	valid 92:9 118:8	83:6 84:8 88:4 88:7	133:9 133:13
<b>unit</b> 11:13 11:17	157:23 158:4	119:13	88:11 89:1 90:8	134:11 134:22
11:22 12:3 15:2	159:18 164:17	<b>value</b> 13:18	91:8 91:16 95:21	136:16 136:24
15:17 16:7 18:21	166:12 167:7	values 125:17	98:17 100:21	137:8 137:17 138:2
21:4 27:25 28:21	167:17 167:20	valve 23:6 23:6 23:9	101:15 103:12	141:22 141:23
29:2 29:10 29:17	168:11 169:2	28:3 28:4	104:14 107:13	142:2 142:2 146:5
29:22 29:23 33:3	<b>update</b> 12:18 85:15	valves 23:4	110:22 110:23	146:6 148:11
33:13 37:24 40:20	92:1 168:8	vance 6:10 6:10 6:11	113:8 120:20	vessels 25:10 105:14
42:1 77:14 80:8	<b>updated</b> 89:17 90:11	6:11 9:8 10:2 10:6	127:18 128:2 135:5	106:22 108:23
97:21 105:15 106:6	upgrading 51:4	10:19 11:1 11:3	138:4 141:20	108:25 113:13
109:2 109:4 112:13	<b>upon</b> 13:20 47:11	11:7 12:3 12:7	143:21 144:17	113:20 123:1 125:9
112:20 117:1 118:1		vapor 3:3 5:16 20:9	147:17 148:1 150:9	· · · · · · · · · · · · · · · · · · ·
120:8 132:8 132:16		20:15 20:21 21:2		vi 3:5 3:13 5:7 5:9
132:21 133:3	158:18	38:25 39:19	156:5 158:22 162:1	-,
133:25 140:25	<b>upset</b> 44:22 64:1	variance 19:16 40:22	162:2 162:22 163:7	85:6 85:8 85:8
143:20 147:5 148:9		42:25 43:21 44:7	164:16 167:4	86:10 104:15 157:8
160:3 161:11	12:12 12:17 16:21	44:10 45:7 47:10	168:13	<b>via</b> 116:9
170:12	18:15 30:24 70:24	47:22 47:25 48:8	venues 104:8	vicinity 54:14 54:16
<b>units</b> 30:10	87:2 97:7 119:22	48:19 61:22 67:5	verbal 7:1 8:9 9:1	vicki 7:18
<b>unless</b> 137:10 161:8	130:14 130:20	68:9 74:18 74:23	9:13 9:22 9:25 18:1	video 150:10 153:7
168:3	140:5 150:15 155:7		19:1 19:21 38:16	vii 3:15 117:24 157:8
unlock 59:2	155:13	77:2 78:13 78:15	41:16 42:7 42:12	159:15
until 12:6 46:12 50:5		78:18 79:2 79:13	42:15 43:8 80:13	<b>viii</b> 3:19 24:12 124:9
52:6 59:21 64:3	95:20 100:13	79:25 80:6 80:9	83:16 83:21 83:24	125:18 126:1 126:4
<b>up</b> 4:9 5:11 5:12	110:14 117:25	80:11 80:17 81:6	91:14 94:8 94:14	126:13 127:9
11:20 14:2 14:5	119:14 123:8	81:8 81:11 84:1	94:19 105:2 111:24	
14:17 14:18 14:21		84:13 85:8 87:24	117:20 119:20	violations 19:13
15:16 15:23 16:25	129:7	153:5 161:9 161:10	verbiage 140:2	visit 47:14 55:9
18:20 18:24 23:7	used 65:13 65:17	162:10 162:23	verified 68:10	visited 75:7
33:7 44:15 49:9	85:13 103:25 120:3		verifies 73:23	visits 46:13
49:13 58:2 58:22	121:7 121:23	variances 66:25	verify 72:16 114:10	visual 154:19 156:22
61:2 67:20 73:11	122:17 122:23	68:11 76:17 79:6	127:11	visually 73:18 73:19
76:22 93:14 96:9	128:20 139:20	148:2	versed 102:21	150:11
96:13 96:17 96:20	146:7	variations 102:14	versus 112:11	<b>volatile</b> 139:15
98:23 98:24 99:2	<b>useful</b> 21:13	variety 28:16 67:25	vessel 24:5 24:7	<b>volume</b> 26:21 27:16
99:8 99:9 99:12	user 2:2 2:11 95:20	ve 10:4 11:5 11:15	24:12 24:13 25:6	31:14
99:14 100:4 100:5	120:10 148:11	11:17 24:9 25:19	25:9 25:21 26:2	vote 83:5 88:5 96:7
102:24 104:18	160:5 160:10	29:8 31:2 33:13	26:10 26:25 27:8	169:1
104:21 105:23	160:13 160:15	34:20 34:21 36:24	40:3 40:12 43:22	voted 95:17
107:19 116:7	160:18 160:22	37:23 38:13 45:22	77:13 92:9 97:13	votes 4:11
120:14 120:24	using 79:1 129:23	50:17 51:4 51:6	98:2 98:11 100:10	voting 9:24 42:14
123:9 133:14	usually 16:23 63:20	53:4 53:5 53:22	101:21 105:10	83:1 83:23
134:15 135:18	utilized 53:16	54:1 54:6 59:23	106:1 106:24	03.1 03.23
136:18 136:21	utilizes 45:25	62:8 62:10 63:8	108:20 109:5	$\mathbf{W}$
137:21 137:23		63:19 65:21 66:19	109:10 109:10	wait 108:5 108:9
139:15 142:7	$\mathbf{V}$	67:16 70:2 72:4	109:24 110:17	waited 108:8
145:13 147:9 150:9		07.10 70.2 72.7		wanted 100.0

	1			
<b>waiting</b> 54:18 161:23	36:1 37:4 37:18	<b>when</b> 14:6 16:11	93:3 100:7 105:9	146:4 151:13
walk 86:20 86:21	38:10 39:8 39:14	20:10 21:4 29:13	107:3 110:1 136:8	151:14 152:1 154:9
	40:14 41:23 67:17	29:15 33:7 37:1	148:7 148:25 151:7	l
156:23	72:18 73:4 73:6	54:9 54:17 61:3	151:7 160:12	154:10 154:11
walker 154:8	l		160:19	l
wall 27:3 27:12 31:5		63:16 72:3 75:3		168:6 168:16
want 4:6 4:12 7:9	98:22 101:15	75:5 76:2 76:6	whoever 150:23	williamson 170:3
7:12 9:6 11:4 14:1	101:16 102:15	81:13 82:21 82:23	151:6	<b>willing</b> 136:7
14:13 16:21 61:25	102:16 149:2 149:3		whole 12:11 16:11	wire 45:12
63:22 71:6 71:11	150:4 155:16	100:5 101:25 121:6		wired 45:10
78:4 79:3 81:3 81:8			127:24 128:6 147:8	
81:18 84:19 90:5	156:20 156:24	124:11 124:12	149:17 167:22	<b>wisdom</b> 165:20
92:8 95:7 96:15	way 15:23 16:1 29:14		<b>whom</b> 71:17	wise 164:20
100:15 103:21	34:25 35:22 54:6	137:16 139:2	whose 45:2	wish 9:9 79:20 87:2
111:3 116:16	66:2 66:4 79:23	146:15 147:21	<b>why</b> 30:13 39:10	within 8:2 15:17
116:17 121:1	82:10 97:10 98:3	151:3 151:15	49:12 49:15 82:6	15:17 23:2 25:13
121:25 125:24	104:20 106:12	153:20 158:8 159:1	103:19 108:20	134:1 135:20 170:7
126:17 129:1	106:14 109:2 121:7		124:25 130:15	witness 110:12
129:12 129:13	128:25 131:4	167:19	130:17 135:23	170:20
129:14 129:17	140:15 146:24	where 22:25 27:7	142:6 150:14	witnessing 110:2
130:2 152:15	147:16 152:12	32:8 32:10 32:24	151:14 153:13	won 4:9 12:10 62:21
154:11 156:15	152:15 154:13	33:8 35:21 40:7	157:15 161:23	99:6 155:17
158:23 159:14	154:24 170:17	40:8 49:6 53:13	163:14 167:21	wondering 37:6 51:8
161:18 161:19	<b>wayne</b> 7:10	54:5 55:20 57:18	167:22	62:20 74:21
163:23 164:17	wear 28:25	58:5 58:9 60:21	wife 7:18 168:10	word 97:22 100:23
165:2 165:12	website 76:23 82:8	64:22 65:14 70:13	will 8:1 8:13 11:24	146:7 147:11
wanted 7:21 11:10	82:10 110:24 138:4	70:21 74:24 77:21	14:7 14:8 14:11	166:25
12:21 41:11 48:25	157:14 157:22	88:17 104:9 107:17		wording 136:23
92:22 100:1 107:19	wednesday 3:21	109:17 109:19	17:5 18:2 18:4	148:4 148:5
123:20 133:20	168:17	110:8 112:25	27:25 32:16 33:23	words 10:18 24:6
133:21 134:6	week 16:23 17:1 18:5	114:15 115:5	35:2 38:21 41:22	32:10 32:12 121:3
wanting 36:1 38:8	18:6 85:12	120:25 124:10	45:13 46:5 46:7	121:12 121:23
wants 108:8 122:8	weekly 158:11	125:11 127:21	46:9 46:10 52:16	
139:14 139:18	weeks 82:8 128:22	130:25 131:25	55:9 55:11 55:22	123:14 142:13
158:25 161:23	welcome 4:6 4:12	133:20 138:11	58:22 66:2 71:3	148:10 148:18
war 103:21 124:1	12:12 42:21 42:21	139:8 139:22 148:4		150:1 153:16 166:8
124:2	95:14 130:14	152:25 162:10	82:7 82:9 82:12	work 11:15 16:1 16:
ware 5:18 6:17	welding 132:20	166:5	82:15 82:22 83:5	16:9 16:10 17:5
wasn 37:12 76:13	139:12	whereof 170:20	83:11 84:12 84:24	18:13 44:15 53:6
90:17 91:20	wellbeing 30:3	whereupon 12:13	85:15 85:22 85:23	58:19 95:8 95:13
water 20:23 21:5	went 49:25 103:23	130:9	85:24 87:3 89:16	130:2 130:7 130:22
21:22 22:3 22:19		wherever 78:14	90:10 92:17 97:7	130:23 131:5
	109:17 123:25 124:1 124:2 124:3	whether 13:24 15:6	102:5 106:14	131:18 133:8
23:5 23:6 23:22		102:1 128:20 147:2	l	133:16 135:14
23:25 24:1 25:20	weren 7:4	149:1 161:10	116:3 116:7 116:7	136:8 139:24
26:1 26:21 26:22	whatever 26:4 26:7	whip 166:25	116:8 116:18	159:12
27:1 27:4 27:5 27:8		who 16:24 16:25	117:13 130:7 130:8	worked 11:23 96:4
27:16 28:4 29:8	126:11 129:1	18:8 18:9 47:20	131:3 135:12	workforce 1.1 3.22
29:16 30:22 31:12	133:18 152:14		137:25 138:11	5:22 11:9 12:2
31:14 31:16 31:17	154:11 154:16	48:2 51:19 52:19 53:24 55:16 59:18	138:12 138:19	132:11 168:18
31:23 31:24 32:2	155:12 156:17		138:20 139:9	170:11
35:10 35:19 35:25	157:1 157:10	60:3 61:14 61:15	138:20 139:9	<b>working</b> 10:25 31:1
		76:4 81:10 88:21	137.11 140.41	

53:14 90:18 90:25	134:25 135:10	<b>13</b> 89:13 107:23	118:23	<b>39</b> 146:4 147:11
119:24	<b>yep</b> 38:6	108:12	<b>2020</b> 1:23	147:17
workplace 11:11	<b>yesterday</b> 7:20 17:7	<b>136</b> 110:14	<b>21</b> 120:17 121:11	<b>3rd</b> 168:17 170:13
15:18 170:12	yield 121:8 121:9	<b>14</b> 3:3 3:4 3:5 3:14	123:7	
works 134:1 145:15	<b>yours</b> 40:19	3:14 3:14 20:9	<b>21st</b> 18:7	4
world 124:1 124:1	yourselves 43:11	42:24 84:12	<b>22</b> 4:2 21:7 35:20	<b>400</b> 33:21 44:1 45:17
worth 14:20	84:25	<b>1423</b> 2:9	39:9 40:23 41:19	89:1
worthless 101:14		<b>15</b> 24:17 24:21 25:11	43:2 43:23 147:18	<b>4000</b> 87:10
worthwhile 159:9	Z	27:11 76:21	147:18 147:24	<b>4006</b> 2:12
worthy 151:11	<b>zone</b> 33:3 33:10	<b>150</b> 40:13 89:1	148:17 160:9 163:9	<b>43</b> 3:4 142:21
wouldn 40:22 103:18	}	<b>15th</b> 7:11	<b>220</b> 3:23	
116:16 129:13	<b>0</b>	<b>16</b> 52:17 53:8 56:23	<b>221</b> 1:25	5
129:15	<b>00</b> 3:21 14:9 14:11	57:1 57:3 57:8	<b>221a</b> 40:1	<b>50</b> 148:21 156:4
wow 165:21	84:8 168:1 168:19	<b>160</b> 39:15	<b>23</b> 131:24 132:2	<b>55</b> 125:15 127:6
wright 102:15	<b>000</b> 44:1 89:10	<b>1659</b> 2:6	140:14	<b>550</b> 33:23
written 53:6 141:21	125:15 127:6	<b>166</b> 19:10	<b>234</b> 1:24	<b>5th</b> 7:19
142:11	<b>01</b> 118:11	<b>168</b> 19:11	<b>235</b> 2:3	
wrong 68:20 69:20	<b>03</b> 3:16 3:16 43:1	<b>16th</b> 14:10 170:21	<b>24</b> 54:16 60:22 62:9	6
123:16	43:1 84:15 84:15	<b>17</b> 112:4	85:12 119:22	<b>600</b> 28:17
	95:6 95:6 95:19	<b>17th</b> 14:10 18:6	126:17 130:24	<b>61</b> 159:9
Y	95:19 109:18	<b>18th</b> 14:9 18:4	131:17 157:1	<b>615</b> 1:25
yeah 25:15 29:6 36:4	109:18 116:25	<b>19</b> 116:24	<b>25</b> 31:10 123:5	<b>64</b> 109:19
38:3 56:8 56:10	116:25	<b>1914</b> 121:23 127:7	131:17 147:22	<b>650</b> 125:16 125:21
65:5 65:6 74:7 74:9	<b>04</b> 21:7 41:19 43:2	<b>1949</b> 165:18	<b>250</b> 39:16 39:21	<b>68</b> 118:10 118:16
77:19 77:23 83:12	43:23 84:15	<b>1955</b> 147:22	<b>27</b> 120:18 121:12	118:23
89:4 102:19 107:9	<b>06</b> 21:1 31:4 37:7	<b>1969</b> 104:23	123:8 126:7 126:8	7
112:6 119:7 121:21		<b>1982</b> 44:5 50:11	147:23	
123:11 123:24	<b>07</b> 116:25	68.19 69.18		<b>700</b> 85:19
127:4 137:6 139:7	<b>0800</b> 3:16 21:7 41:19	<b>19th</b> 14:9 18:4	3	<b>75</b> 28:16
139:9 143:10	43:1 43:23 84:15		<b>30</b> 14:9 14:10 53:1	8
144:14 145:20	95:6 95:19 109:18	2	56:9	
159:8 159:17	116:25	<b>20</b> 3:3 28:18 28:20	<b>30th</b> 13:2	<b>800</b> 89:13
166:22 167:17	<b>086</b> 19:12	41:22 44:9 44:13	<b>33</b> 125:7 131:1 131:3	
167:24	<b>09</b> 3:3 3:14 20:9	51:2 56:8 61:17	131:10	<b>84</b> 3:5
year 13:24 18:22	1	64:4 64:8 64:12	<b>34</b> 131:6 131:9	<b>85</b> 28:7
44:4 56:9 63:16		72:20 148:23	131:13 131:14	9
75:25 76:11 113:11	I	151:25 152:9	131:17	
121:20 128:15	84:7 84:8 105:6	152:12 154:23	<b>35</b> 131:14 131:17	900 1:24
154:9	100 124:8	155:12 161:14	<b>36</b> 19:13	902 28:11
yearly 29:1 42:2	<b>1000</b> 39:23 41:5	162:11 162:21	<b>368</b> 129:18	<b>90s</b> 44:8 48:10 48:12
127:22	154:1 154:8 156:7	165:13 165:21	<b>37</b> 141:1 146:20	<b>918</b> 19:11
years 10:10 10:13	<b>1089</b> 1:25	<b>200</b> 40:18	147:10 147:17	<b>941</b> 85:20
13:24 14:2 32:7	11 3:5 3:14 84:8 84:8	<b>2005</b> 10:10 12:6	<b>37069</b> 1:24	<b>98</b> 129:21
36:17 53:1 66:20	84:12 97:7 105:24	<b>2009</b> 10:9	<b>371</b> 1:22 170:24	<b>99</b> 36:21
66:22 76:21 104:17		<b>2013</b> 49:25 68:17	<b>37118</b> 2:13	
112:15 112:15	<b>12</b> 108:24 170:25	<b>2014</b> 1:10 3:22 12:6		
112:22 113:17	<b>122</b> 118:10 118:16	50:1 170:13 170:21		
113:21 114:17 114:20 114:21	118:23	<b>2015</b> 13:2	<b>37615</b> 2:3	
114:20 114:21 115:12 124:4	<b>125</b> 27:11	<b>2016</b> 170:25	<b>38</b> 133:8 137:2	
113.14 144.4	<b>1275</b> 39:23 41:5	<b>202</b> 118:10 118:16	137:25 140:15	