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STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION

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Case 06-M-1078 - Proceeding on Motion of the  
Commission to Audit the Performance of  
Consolidated Edison Company of New York, Inc. In  
Response to Outage Emergencies.

Case 06-E-1158 - In the Matter of Staff's  
Investigation of Consolidated Edison Company of  
New York, Inc.'s Performance During and Following  
the July and September Electric Utility Outages.

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Technical Conference  
90 Church Street  
New York, New York

October 26, 2006  
9:00 a.m.

PRESIDING:

ELEANOR STEIN,  
Administrative Law Judge

ORIGINAL

## 1 APPEARANCES:

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1 JUDGE STEIN: This is case 06-E-0894, the  
2 proceeding on motion of the Commission to investigate  
3 Con Edison outages in its Long Island City electric  
4 network.

5 It is October 26, 2006 and we are beginning  
6 today's technical conference with a brief preliminary  
7 attorneys' conference and I would like to place on the  
8 record counsels' position on the question of whether or  
9 not people speaking today in the capacity as experts  
10 should be sworn.

11 And I will turn the chair over to Con Edison.

12 MR. LUBLING: Your Honor, on behalf of Con  
13 Edison, I would like to state an objection on the record  
14 to your ruling of yesterday. This is the first time we  
15 heard that you were even considering having all expert  
16 witnesses sworn in.

17 Obviously Con Edison has no objection to having  
18 its experts or its panelists swear to tell the truth.  
19 We are concerned with an incorrect and a misleading  
20 record that would indicate to parties, especially  
21 potential litigants, that this was, this proceeding  
22 today was a full evidentiary hearing with all due  
23 process.

24 This is supposed to be a technical conference.

1 We thought this was supposed to encourage a free flow,  
2 an exchange of experts' opinions. I think having  
3 engineers swear, having them sworn, will have a chilling  
4 effect on a free flow of information.

5 They won't hypothesize. They won't give the  
6 99.9 percent opinion. I think it will have the opposite  
7 effect of what you really want to achieve today.

8 Con Edison objects even stronger to having other  
9 parties' experts being sworn in. The other parties'  
10 experts are here to ask questions. They are not making  
11 any presentations. We have not received any  
12 presentations. We have no idea what they will be  
13 speaking about.

14 Are we going to have a technical conference when  
15 staff issues its draft report? Are we going to have  
16 sworn testimony by staff where we can ask questions on  
17 the record? Are we going to have sworn testimony when  
18 other parties submit comments on staff's report? Are we  
19 going to have a technical conference, an evidentiary  
20 hearing with sworn testimony, with cross-examination by  
21 one side, with no redirect, no objections?

22 Your Honor, I really plead with you to retract  
23 your ruling insofar as it requires the experts to be  
24 sworn in.

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JUDGE STEIN: Thank you. Did you want to respond?

MS. HARRIMAN: Yes, Your Honor. Kim Harriman for Department of Public Service staff. We don't have an objection to proceeding with the technical conference without the swearing in of Con Edison's technical panel.

We believe that the record will stand and be transcribed and utilized in whatever fashion parties wish to in the future, depending on the circumstances, and that inconsistencies will stand no matter whether or not the witness took an oath or not.

We do not believe--just going to Mr. Lubling's point regarding other parties providing testimony from their technical experts, that that is the purpose of today's technical conference. We do not intend to have our technical witnesses offering testimony. They are here to provide questions of a technical nature to the company's panel, and to have that free flowing dialog which I think is the purpose of the technical conference.

We don't think that it would be appropriate for any party's technical witness providing testimony. I think we are here seeking answers to questions that we have come across during the course of staff's

1 investigation into the events in Long Island City  
2 network, in the Queens area in general.

3 That being said, I also don't believe that it is  
4 a due process violation should your Honor choose to  
5 swear in the technical panel. This is not a litigation.  
6 It's not an adversarial proceeding, although it may have  
7 the tenor of such. There has not been a prudence  
8 proceeding instituted by the Commission. This is a  
9 staff investigation that will culminate in a report and  
10 recommendations that we will make to the Commission.

11 The company will be afforded all due process as  
12 far as those recommendations go, and if there are  
13 subsequent proceedings more adversarial in nature the  
14 company will have available all of its rights to defend  
15 itself in that adversarial proceeding.

16 That's all I have.

17 JUDGE STEIN: Does anyone else want to speak to  
18 this issue?

19 MR. LUBLING: Your Honor, I just want to comment.  
20 I happen to agree with Ms. Harriman. Other experts are  
21 here to ask questions, not to present testimony, and  
22 therefore there is purpose whatsoever to have other  
23 technical experts be sworn in. Are they going to swear  
24 that all the questions we ask will be the truth? They

1 will ask questions based on the presentation.

2 I also want to point out that staff keeps saying  
3 this is an investigation. This was instituted as an  
4 investigation. This is not yet a proceeding that  
5 requires a hearing by statute, yet we have other parties  
6 who are asking double the amount of interrogatories that  
7 staff is asking. We're spending 14 to 16 hours a day on  
8 interrogatories. This is more of an inquisition to us  
9 than an investigation.

10 JUDGE STEIN: And is that argument directed at  
11 the inappropriateness of swearing witnesses at this  
12 point?

13 MR. LUBLING: Yes.

14 JUDGE STEIN: When I initially proposed the  
15 holding of technical conferences in this case I referred  
16 parties to two prior investigations, comparable in some  
17 ways, very different in some ways, in which this  
18 mechanism was used.

19 In both of those--one was the renewable portfolio  
20 standard proceeding and the other was the Verizon 271  
21 application to enter the long distance market--we held a  
22 series of technical conferences designed to elicit a  
23 certain amount of free flow information with the  
24 understanding that this was a somewhat hybrid form. At

1 times it looked like a hearing, an evidentiary hearing.  
2 At times it looked like a freeforall. At times it  
3 looked like a collaborative meeting.

4 But in general, I believe the parties involved in  
5 those proceedings, including the affected utilities, in  
6 the end considered it to have been a worthwhile  
7 exercise.

8 If you did review the proceedings that were used  
9 in those prior cases, you will see that all subject  
10 matter experts were sworn. And the reason is--although  
11 I agree with you, Mr. Lubling, that someone asking  
12 questions is not giving evidence and is not  
13 appropriately sworn, in the interest of encouraging  
14 discourse back and forth we sometimes will have subject  
15 matter experts from other parties who are going to be  
16 making statements. For example, I visited that office,  
17 or I saw that manhole and when I was there looked to me  
18 like X.

19 I read my obligation to the Commission to be to,  
20 first and foremost, create a reliable record. And  
21 accordingly, I am going to overrule your objection this  
22 morning and go ahead with swearing in of all subject  
23 matter presenters, whether they are here on behalf of  
24 Con Edison or here on behalf of another party.

1 I will say that I appreciate your concern about  
2 the mix of formal and informal process here. I do think  
3 it's a concern, and I think that concern will go to the  
4 question of the weight of any particular statement or  
5 evidence that is given here today.

6 If in the view of Con Edison or any other party a  
7 statement that's made because it was not subjected to  
8 the full test of cross-examination should not be given  
9 particular weight in this record, then parties will have  
10 an opportunity to make that point when they file such in  
11 the case.

12 I am placing that, that's my ruling on that issue  
13 for the record. Are there any other issues about the  
14 procedure for today? Okay. Seeing none, it's almost  
15 9:30, so, let's proceed with the first presentation.

16 I will say that if the Con Edison panel wants to  
17 reallocate the time that's allocated to it on today's  
18 agenda, and use more for the morning panel, or for that  
19 matter less, I have no objection and parties don't seem  
20 to have an objection.

21 With that, let's go ahead.

22 MR. LUBLING: Are you going to take appearances?

23 JUDGE STEIN: My name is Administrative Law Judge  
24 Eleanor Stein. I am presiding over this case. I am

1 going to take appearances for the record. I would like  
2 to begin with Con Edison and go to department staff.  
3 And if you haven't participated in one of these  
4 proceedings everyone who is here representing an active  
5 party I am asking you to identify yourself for the  
6 record and then to give the reporter a business card or  
7 some other form of identification so that she can keep  
8 straight who's making what point for the record.

9 Would you like to begin?

10 MR. LUBLING: Yes. For Consolidated Edison  
11 Company of New York, Inc, Chan Lubling, Marc Richter,  
12 Mary Krayeske, Martin Heslin, and David Warner.

13 MR. LANIADO: On behalf of TransGas Energy  
14 Systems, Sam Laniado, Read and Laniado, and Ricardo  
15 Austria of Pterra, LLP.

16 MR. WALTERS: For New York State Consumer  
17 Protection Board, John Walters.

18 MS. HARRIMAN: For Department of Public Service  
19 staff, Kimberly Harriman, Michael Worden and Nancy  
20 Plotkin.

21 MR. LOUGHNEY: For City of New York, Robert  
22 Loughney and Moshe Bonder from Couch White law firm, and  
23 Michael Delaney, vice president of New York City  
24 Economic Development Corporation.

1           Your Honor, we have two expert witnesses we had  
2 identified as speakers during the meeting and one of the  
3 them is Tim Taylor. The other one is sick and in his  
4 place would be--that was Richard Peck--will be Ralph  
5 Mauro. They will be the two people you will be swearing  
6 in.

7           JUDGE STEIN: When we are done with appearances I  
8 am going to ask everyone here in their capacity as a  
9 subject matter expert to stand.

10           Other appearances for the record.

11           MS. BURNS: For the Attorney General's Office,  
12 Mary Ellen Burns and Charlie Donaldson.

13           MR. NORLANDER: For the Public Utility Law  
14 Project of New York, Gerald Norlander.

15           MS. BONILLA: Alyssa Bonilla from Western Queens  
16 Power for the People Campaign.

17           JUDGE STEIN: Thank you.

18           MR. FITZGERALD: For NYSEG and RG&E, the law firm  
19 of LeBoeuf, Lamb, Greene & MacRae, by Brian Fitzgerald.

20           MR. BAKER: Liam Baker, US Power Generating  
21 Company.

22           JUDGE STEIN: Any other appearances for the  
23 record? Seeing none--

24           MR. LUBLING: I would like to place into evidence

1 the presentation we are making whenever you are ready.

2 JUDGE STEIN: I am going to do the swearing in  
3 first. Will everyone here in their capacity as a  
4 subject matter expert please stand.

5 (Subject matter experts duly sworn or affirmed.)

6 JUDGE STEIN: Thank you very much. And Mr.  
7 Lubling, you had something--you would like to enter into  
8 evidence the presentations?

9 MR. LUBLING: Yes, Your Honor. First, I would  
10 like to enter into evidence the company's Comprehensive  
11 Report on Power Outages in Northwest Queens in July 2006  
12 dated October 12, 2006. All the parties have a copy and  
13 I am prepared to give the reporter both a CD and a hard  
14 copy.

15 JUDGE STEIN: Thank you. We will mark this as  
16 Exhibit 1 for today.

17 (Exhibit 1 marked for identification.)

18 MR. LUBLING: Second, Your Honor, I would like to  
19 have marked as an exhibit a company report dated  
20 September 25, 2006 entitled Part 105 Compliance Filing  
21 by Consolidated Edison Company of New York, Inc., Event  
22 Preparation, Recovery and Communication, Power Outages  
23 in Northwest Queens July 2006. I only have a hard copy.

24 Third, Your Honor, I would like to have marked as

1 an exhibit this morning's slide presentation. It  
2 consists of 77 slides and it's entitled Long Island City  
3 Network.

4 (Exhibits 2 and 3 marked for identification.)

5 I would like to introduce John Miksad, senior  
6 vice president of electric operations, John Mucci, vice  
7 president engineering and planning, Ed Rasmussen is here  
8 this afternoon, vice president and controller, Matt  
9 Ketschke is general manager of Brooklyn-Queens electric  
10 operation. David DeSanti, section manager Long Island  
11 City recovery team, Joseph Murphy, the department  
12 manager Brooklyn-Queens energy services. Mary  
13 McCurtney, here this afternoon, director of public  
14 affairs. Richard McKnight, the general manager customer  
15 analysis. And the last person is not here I will  
16 introduce this afternoon.

17 JUDGE STEIN: Thank you very much.

18 MR. MIKSAD: Good morning. I am John Miksad,  
19 senior vice president of electric operation for Con  
20 Edison. I am going to start today's presentation by  
21 giving you an overview of Long Island City network, the  
22 events and a little bit about our distribution system.

23 This is what we plan to cover today per the  
24 guidance we received in the proposed agenda. We have an

1 overview for you, talk a very little bit about summer  
2 preparation, talk about the sequence of events that  
3 occurred during the Long Island City event, what  
4 happened, and why. We're going to talk about operations  
5 under multiple contingencies, and the decision whether  
6 to maintain the network or shut the network down.

7 We are going to talk about the customer impact  
8 within that network, the restoration and recovery  
9 effort, the action plan that's outlined in the report we  
10 just submitted. Then this afternoon we will talking  
11 about customer service, communications and the  
12 accounting and system investment.

13 This is a simplified one line diagram just to  
14 frame what we are talking about here today. Basically,  
15 electricity is generated from a generating station at  
16 low voltage, transformed up to high voltage. We call  
17 that transmission system. That's represented by this  
18 line here and this line here.

19 We have transmission substations, we have a  
20 number of those on the system that act as hubs or  
21 collectors that then shift the energy to what we refer  
22 to as area substations.

23 In the case of the North Queens--in the case of  
24 the Long Island City event north Queens was the area

1 substation that supplied the Long Island City network.  
2 From there, the power is stepped down in voltage again  
3 down in this case, in the case of Brooklyn and Queens,  
4 down to 27,000 volts, 27 kv, and we have a number of  
5 parallel paths that we call feeders that then supplies  
6 an individual network.

7 This one line is very simplified. It shows only  
8 four of them. In the case of the Long Island City event  
9 in that network we have 22 individual supply feeders  
10 that supply that network. The feeders then are  
11 connected to transformers, which are indicated here at  
12 these blue boxes which step the voltage down once again  
13 down to 120 volts, which is the utilization voltage that  
14 we use in outlets and lights and power the equipment  
15 like the computer.

16 That's the network. I want to talk a little bit  
17 more about that system but I want to contrast it on this  
18 side to what is used in most of the rest of the state,  
19 most of the rest of the country, in fact. And that is  
20 this, which shows a distribution feeder with an  
21 individual transformer that steps the voltage down  
22 similarly down to 120 volts and supplies to customers.

23 What's most notable about that is there's one  
24 half a supply. If anything breaks along the supply path

1 customers are out of service. That is not the case with  
2 the network system. I am going to talk a little bit  
3 more about that in the next slide.

4 This is--just to break it down, we have broken  
5 down what we call the primary system or these supply  
6 feeders away from the secondary grid, the 120 volt grid.  
7 This shows eight feeders rather than four in the  
8 previous slide. Still not the 22 that supplied the Long  
9 Island City network, but it gives you a better feel of  
10 the complexity of the network system.

11 Once again, it's showing this 27,000 volt feeders  
12 that make their way--that distribute out from the area  
13 station out to where the customers need power. And then  
14 we are showing the transformers connected to them in  
15 green.

16 We have broken away, as I said, the primary  
17 system from the secondary system here, but actually  
18 these transformers are connected to these--the blue  
19 lines. The blue lines represent secondary cables. Once  
20 again, very simple. We are showing one line going down  
21 what would be a street.

22 This would be an intersection and cables  
23 proceeding down the block and then connected in three  
24 other directions to cables. In actuality, there are

1 multiple cables that are under the street that are  
2 supplying the grid, that are making up this grid.

3 Then the customers which are going--could be a  
4 home or apartment building or commercial establishment,  
5 are then supplied by tapping off that grid to supply the  
6 electricity.

7 There are really three distinguishing features of  
8 the network design that make it such a reliable supply  
9 normally--obviously, we are going to talk about an  
10 exception to that today--and that is we designed this  
11 system for loss of any two of the supply feeders to the  
12 network on the peak summer day. We called it second  
13 contingent by N minus two design. We redesign the  
14 system with additional redundancy so that any two  
15 distribution feeders can be lost on peak summer day  
16 without any impact to customers. That's the first  
17 feature.

18 The second feature I have already alluded to, and  
19 that is that this entire system is built underground.  
20 Generally it's housed in conduit and underground  
21 structures, manholes, that house all of the components  
22 on the grid. It keeps it--it protects it from  
23 hurricane, storms, you know, a lot of the weather type  
24 events that affect that overhead type distribution

1 system that I talked about earlier.

2 And then the third component of this system is  
3 that you can see redundant path on the secondary system  
4 also, this 120 volt system, so that if something happens  
5 to a cable on this side of the block there is still a  
6 supply path for the customers on the other.

7 So, those are really the three characteristics of  
8 the network system that make it--give it such a robust  
9 design and such a high level of reliability. We just  
10 now overlaid the two systems, and in fact they do, under  
11 the streets, those conduit systems are shared between  
12 primary and secondary cables.

13 So, this gives you a little better feel for the  
14 complexity, but if you look at the actual systems there  
15 are multiple cables and it becomes a lot more cluttered  
16 picture, but for simplicity for the slide we wanted to  
17 just bring it down to a presentable level.

18 Now, this gives you sort of a cutaway view of  
19 what I have been talking about and I think it brings  
20 the--makes it clearer. What we have done is used the  
21 same color code on that previous slide and show the  
22 primary feeder, the 27,000 volt feeder, in green, and  
23 then the secondary cable, which is called the secondary  
24 main here, this 120 volt cable, in blue.

1           You can see that this is representing a conduit,  
2           which is just some material that houses the cables, and  
3           then goes into an underground structure where it is  
4           spliced together and continue on and cap off the supply,  
5           other components.

6           In this case of the primary feeder this is the 27  
7           kv feeder that then supplies a transformer. This is the  
8           box which houses the transformer. And the transformer,  
9           all it does is step down the voltage from 27,000 volts  
10          on this side down to 120 volts on this side.

11          And then that grid becomes interconnected, like I  
12          showed on the previous slide, and it clears that tap off  
13          point to help the customers supplied. That's just by  
14          way of overview.

15          There is a process that we go through.  
16          Everything we do, really, is focused toward the summer.  
17          Summer is our high demand period. Obviously that's when  
18          all the buildings in New York City have their air  
19          conditioning on, the electrical load increases  
20          significantly from the rest of the year to the summer.

21          We had about 13,000 megawatts or 13,000 million  
22          watts was what we supplied this past summer. All time  
23          record for New York City and Westchester county. But  
24          the only purpose of this slide is that what we do for

1 the summer doesn't just happen in the three months of  
2 the summer. It happens year round.

3 And just to give you a feel. The summer  
4 experience is where we are actually obviously operating  
5 the system, but also capturing all the data from the  
6 system, looking at the peak loads of each station, the  
7 peak load of the system, and then based on that  
8 experience will then generate a load forecast for the  
9 following summer.

10 That occurs sometime in the September or October  
11 time frame. So, now we are looking to say, okay, based  
12 on our experience this summer here's what we are  
13 anticipating for the following summer. And there is  
14 some stations that have--we are seeing higher demand  
15 growth, some we are seeing less, and take into account  
16 all of that in this period.

17 At that point we enter into the design phase  
18 where all of those--in order to reinforce the system for  
19 the following summer, the engineers for the company then  
20 do the design process where they are modelling the  
21 system, and then telling the construction organizations  
22 here's what we need to do.

23 Here's--we need to reinforce this section of  
24 cable. We need to change out this transformer to a

1 higher capacity in order that in the following summer we  
2 will be able to meet the load, plus that redundancy that  
3 I have talked about which I referred to as the second  
4 contingency design.

5 So, that reinforcement then occurs from September  
6 to June to go to prepare ourselves for the next cycle.  
7 And that continues every year. And this is the result.

8 Just have two quick slides just to put the system  
9 in perspective. This is a slide that reflects the  
10 interruption rate, the customer interruption rate for US  
11 utilities, for all US utilities, and you can see that  
12 it's in the range of about 1000, you see at a high of  
13 1400, 1200, and what that means is the normalized rate,  
14 so for every 1000 customers those utilities supply 1000  
15 customers were interrupted.

16 An interruption rate of 1000 means that every  
17 customer experiences one outage a year. You can see  
18 where it's above that, that would mean every customer  
19 experiences 1.2 outages a year, 1.4 outages a year.  
20 Contrast that for a second to Con Edison. This is Con  
21 Edison's average, which takes into account the network  
22 system that we have talked about, and the overhead  
23 system which we have in Westchester, Staten Island and  
24 some other load density load places. And it shows an

1 interruption rate, the same measure, that normalized  
2 interruption rate, of about 150 or so per thousand  
3 customers. So the average Con Edison customer  
4 experiences an interruption of about once every seven  
5 years.

6 Very often in the network system our customers  
7 experience an outage during a blackout. What I mean by  
8 that is 1965 in the northeast blackout, 1977 in the New  
9 York City blackout, and 2003 with the northeast  
10 blackout. Many of our customers tell us they don't  
11 experience outages other than those large scale events.

12 If I graphed the network system reliability, Con  
13 Edison's network system reliability on this same graph  
14 it would be down in the ten or 15 range down here. As I  
15 said, this is a composite of our entire system, the  
16 network as well as the overhead system.

17 This is just the same comparison looking at the  
18 rest of New York State utilities, which is better than  
19 the rest of the US, and then just that same rate for Con  
20 Edison. You can see this is from 1997 to 2005.

21 We are going to focus in now on Long Island City.  
22 This is our New York City service territory with five  
23 the boroughs, also supply Westchester county, going to  
24 focus in on this area right here, Long Island City.

1           This is a blow up of that area which is outlined  
2 in white to show the areas served by the Long Island  
3 City network. The northwest corner of Queens. You can  
4 see the boundaries here. This is Newtown Creek on the  
5 south, the BQE on the east, the river on the north and  
6 on the west. You got the midtown tunnel here,  
7 Queensboro bridge and Triboro bridge.

8           We high lighted in yellow and red here, these  
9 were the affected areas during the July 17th through  
10 21st event. This network also supplies Rikers Island  
11 shown up above, and it also is one of the two supplies  
12 to La Guardia airport, shown over here. There is  
13 another network supplied from Jackson Heights.

14           Just some stats on the Long Island City network.  
15 This, again, shows just the diagram. I already  
16 mentioned it is supplied from north Queens substation.  
17 It has a peak summer load estimate of 395 megawatts. A  
18 megawatt is a million watts, so, that's 395 million  
19 watts.

20           There are 115,000 customers supplied from this  
21 network. It is supplied, as I mentioned, 22  
22 distribution feeders, and there are 1200 of those  
23 distribution transformers that supply it.

24           The findings, the major findings, and we are

1 going to delve into this in more detail, but high level  
2 findings of the report were really three-fold. That  
3 this was an extraordinary sequence of events that  
4 resulted in the outage to 25,000 customers in the  
5 network. The decision--our decision to maintain the  
6 network minimized the impact for many, many other New  
7 Yorkers, not only the 90 other thousand customers in the  
8 network, but we will talk about some others that would  
9 have been affected. And that we are working to, despite  
10 having those sort of the reliability record I showed in  
11 the previous slide, we are working to strengthen that  
12 performance in our response capabilities.

13 I am going to turn over now to John Mucci, who is  
14 going to talk about the sequence of events, what  
15 happened and why.

16 MR. MUCCI: Thanks, John. Good morning. What  
17 happened in this event can be described in this simple  
18 diagram. Now, keep in mind although this diagram is  
19 simple the complexity of this event is significant and  
20 substantial, but if you think about it, it is initially  
21 starting out with three discrete, unrelated, unusual  
22 events, very improbable in their confluence in the fact  
23 that they all happened together.

24 Any one of these events, on of these three events

1 had it happened in another network, or the three events  
2 would happen in all different networks, we wouldn't be  
3 here today. Not only it is unusual to have some of the  
4 events, but it's extremely unusual to have them all.

5 These events which happened over the period on  
6 Monday lead us into Tuesday into a cycle. And the cycle  
7 became a self reinforcing cycle. I will explain that a  
8 little more.

9 When feeders fail we know that increases the  
10 probability that other feeders may fail, especially  
11 feeders next to them. Feeders in the same proximity  
12 begin to take up the load and the heat that would have  
13 been carried by the feeder is now out of service.

14 As feeders went out of service we had adjacent  
15 feeders go out of service. As adjacent feeders go out  
16 of service, transformers and secondary begin to pick up  
17 the load that was carried by these primary feeders that  
18 are now out of service.

19 And the secondary system, although it's expansive  
20 and 750 miles of underground cable crisscrossed  
21 everywhere in the Long Island City network, still became  
22 highly loaded, in some cases overloaded, in some cases  
23 failed.

24 When components on a feeder, like a transformer,

1 fails the feeder comes out of service. When secondary  
2 overheats, you sometimes get damage to the primary  
3 cables which run in similar manholes and conduits, and  
4 that causes additional feeders to come out of service.

5 Discrete and unrelated events bring you into this  
6 cycle. What gets you out of the cycle is the operator's  
7 ability and the ability to restore feeders to service as  
8 quickly as possible. And all of our operators have been  
9 trained that this is the most effective way to prevent  
10 multiple contingencies is to restore primary feeders.

11 The other way to get out of the cycle, in  
12 addition to restoring feeders, is to reduce load by  
13 appeals, by talking to our large customers, by asking  
14 industrial commercial customers to go on their own  
15 generation, to switch suppliers, that sort of thing.

16 In a nutshell this sort of describes what I am  
17 going to describe in a little more detail next. John  
18 showed you this slide before. The primary, we have  
19 separated the primary from the secondary just for  
20 simplicity. This was a simplified version of the  
21 network. We have in this particular case showing only  
22 eight feeders. The network really has 22.

23 We are showing the secondary in simplified  
24 fashion. This is expansive system of mesh and cables

1 that covers the entire area of Long Island City, every  
2 street, every intersection.

3 In the first event, in the first unusual event,  
4 was a fire in a duct. Between the manholes there is  
5 duct work that carries the primary and the secondary  
6 cables. This duct work caught fire and the secondary  
7 caused the fire and the primary was damaged in two  
8 feeders opened in succession 32 minutes apart.

9 These two feeders are in the same area of the  
10 network. If I go back to the cutaway drawing, you can  
11 see that some of the primary feeders are carried along  
12 in conduits that are adjacent to secondary mains.

13 And secondary mains, this sort of depicts the  
14 type of situation was. Secondary mains travel in a  
15 route. Con Ed facilities travel in a lane because there  
16 are other facilities, water and sewer and telephone,  
17 etc., so Con Ed's facilities carry together and ducts  
18 will come closer in a proximity to each other.

19 In this particular case the secondary duct is  
20 right above the primary ducts. And in that run between  
21 manholes and service boxes, there was a fire. And that  
22 fire is the first event and that fire caused two primary  
23 feeders to come out of service. That in itself is not  
24 terribly unusual, it's not terribly harmful because we

1 have a design that can withstand two feeders going out.

2 Even the two, what we call the two worst  
3 feeders, closest feeders, can go out. Our design is  
4 such that in that situation, N minus two, the rest of  
5 our system is still capable of accepting the load that  
6 was carried by the feeders that went out of service.

7 So in the N minus two situation, or two feeder  
8 outage situation, customers will not be affected,  
9 customers will not even know typically that there is a  
10 problem.

11 I am going to switch now to the second event and  
12 unrelated to the first. In the second event we have to  
13 go into the area station. Now, feeding these supply  
14 feeders, primary feeders, is a set of transformers,  
15 switches, cabinets, that's located in Astoria that is  
16 basically where the power is converted from the  
17 transmission system, the 138 kv down to the 27, and  
18 distributed to the 22 feeders throughout the network.

19 In that area station we have circuit breakers.  
20 This is a simplified version of what existed in the  
21 station. Really giving you the idea of what exactly  
22 what happened. In the first part of this group of  
23 occurrences, one of the feeders became faulty. And I  
24 will explain why that feeder became faulty first.

1           It became faulty because of a connection, a  
2           termination connection to a transformer. This is a  
3           typical underground 500 kva transformer that's used  
4           predominantly in Brooklyn-Queens. Generally, this is  
5           the size that is used.

6           This side of the transformer, which is basically  
7           a ten with three coils on one side, three coils on the  
8           other side, and oil inside, has bushings. These are the  
9           primary bushings, 27 kv coming in, and coming out  
10          through a switch is the low voltage side the 208, 120  
11          you use in your home or apartment, whatever.

12          This is basically the unit that's underground  
13          throughout our system. We have literally 25,000  
14          throughout the Con Ed system of these. They are in all  
15          areas of our networks. This is the termination  
16          connections of the primary, primary cables running from  
17          along the feeder route from the area station and goes to  
18          the primary connections of the transformer.

19          This is the bushings of the transformer where the  
20          connections are both. In this particular case we had  
21          tracking along this insulator to the ground, and that  
22          caused the short circuit or an overload on that feeder.  
23          That feeder--normally this breaker would open to protect  
24          that feeder.

1           In this particular case this breaker did not  
2           operate as we expected, and backed up into the back up  
3           breaker so the back up breaker opens. When the back up  
4           breaker opens we lose two additional feeders to the one  
5           that we had because the back up breakers are usually  
6           supplying several feeders. In this case, three feeders.  
7           These three feeders are out in this instance.

8           What happened to that circuit breaker that it did  
9           not operate. When we examined after the fact we see  
10          that one of the 54 contacts that are in this cabinet  
11          were not making up. Explain a little bit.

12          This is a cabinet a little bit bigger than the  
13          size of large refrigerator. You open the door of the  
14          cabinet and the breaker is inside--about 800 pounds,  
15          this breaker. You can roll it out and it's on wheels.  
16          You can roll it out and you can roll it in. The  
17          protection DC current that supplies the coils in this  
18          breaker is supplied through fingers, and when you push  
19          the breaker in it makes contact with these contacts  
20          here.

21          All 54 make contact. One of those 54 was not  
22          making contact and that's why the breaker did not work.  
23          This is extremely unusual because--this is a C2 advisory  
24          circuit. Our breakers are made such that if a contact

1 does not make up there is a light on this breaker that  
2 goes out.

3           Some cases there is an alarm in the control room  
4 that goes on, but there is usually a light in our  
5 installations designed that if the light doesn't light  
6 something is wrong with the circuit. This breaker is  
7 not going to operate correctly. Operators know that and  
8 they will repair that.

9           In addition, if that light does not light the  
10 operator cannot even close the breaker so you cannot put  
11 the breaker in service. But, sometime between the time  
12 the breaker had operated previously in April, and the  
13 time when it tried to operate in this particular case,  
14 there was a contact that was not fully made up, and the  
15 design of our circuit was such that the monitoring light  
16 for this contact was not designed correctly.

17           The light was in the circuit and was supervised.  
18 The trip coil, everything was fine with the trip coil,  
19 but there was a second path and that second path is what  
20 supplied the trip coil with DC current. Supplies the  
21 breaker to slam open and that trip coil was not being  
22 supplied by the protective relays that are designed to  
23 sense the overcurrent and open the breaker.

24           So, we found in this case this contact is open

1 and this circuit was not telling the operator there was  
2 a problem. Operator believed because of its indication  
3 that we had no problem.

4 To go back to our diagram here, at this point we  
5 only show four feeders out. There's actually five at  
6 this point. We had three feeders, at least three of the  
7 five were very close proximity to each other. In fact,  
8 they were on the fringe, what we call the fringe of the  
9 network, outside of the network, which means that  
10 secondary had to be supplied a further distance.

11 If it was in the middle of the network it  
12 wouldn't have been as serious, but at the end of the  
13 network it's even more serious. Now, as I said before,  
14 operators are trained to restore feeders as quickly as  
15 possible to get out of this kind of a situation, and  
16 that's what they did.

17 And that brings us to the third unusual and  
18 unrelated event. And the third event, we tried to  
19 restore the feeders that, of course, there was no  
20 problem with because remember that the main breaker  
21 opened up, some of the circuits were still good, but one  
22 circuit could be left off to repair and the other  
23 circuits could be restored.

24 When it attempts to restore one of those circuits

1 we experienced something that we never experienced  
2 before. We experienced a problem with inrush that we  
3 never realized we experienced before. Might have  
4 experienced before, we're not entirely sure, but inrush  
5 occurs when the breaker closes. At a certain point it  
6 causes the transformers in the network to magnetize to  
7 absorb energy, which it provides a sudden peak of  
8 current.

9 That peak of current was short circuit current in  
10 the setting of our protective relays and causing the  
11 feeder tube to open up. What happens of course is the  
12 feeders stay out of out of service and you are back to  
13 where you started.

14 I am going to show in more technical detail why  
15 this is unusual, what happened. When looking at the  
16 actual captured wave forms, we do this after the fact,  
17 we have very specialized equipment, equipment we  
18 developed for this purpose, especially for this purpose.  
19 Basically recorded a silograph we use.

20 This blue line shows the wave form of the inrush  
21 current in Long Island City. This particular setting,  
22 this particular relay, the overcurrent relay was set at  
23 4,000 amperes, 4,000 amperes was actually below the  
24 inrush of the magnetizing current that was needed to

1 supply these transformers.

2 Now, since then, of course, we changed our  
3 settings and there is some--there is a lot of science to  
4 doing everything. I am making it look simple. There is  
5 some analysis that needs to be done to do this and  
6 understand this, but we changed our settings so that we  
7 don't have this reoccurrence in the near future. We  
8 have plans to do more modifications later on.

9 But if you filter this signal of the harmonics of  
10 the DC offset or X/R, you would have a significantly  
11 lower inrush. Our engineers believed that this  
12 difference is primarily due to harmonics and the DC  
13 offset. It was not anticipated and not understood until  
14 after the event.

15 That left us in a situation. This is the map of  
16 Long Island City, as you remember, and East River, but  
17 that left us in a situation where there was fringe areas  
18 that had significant numbers of feeders, five feeders,  
19 out of service, and areas that were no longer being  
20 supplied by the primary feeders, which meant if you  
21 lived here you had to be supplied by the green, the  
22 feeders that are in service, the green. Feeders that  
23 are out of service is the brown, black.

24 You had to be supplied by feeders that were in

1 service from a further distance, meaning the secondary  
2 cables, transformers, had to carry more load than we had  
3 designed for, anticipated, and they did. They did carry  
4 more load, but in some cases that caused us problems.

5 This brings us in, these three events bring us  
6 into the recursive situation. That's where we were at  
7 that point. At that point, operators needed to restore  
8 feeders as quickly as possible.

9 And now John Miksad is going to talk a little bit  
10 about what the operator decisions were during this  
11 period.

12 MR. MIKSAD: Okay, this is--now John's taken us  
13 to essentially Monday evening. All of this was  
14 occurring on July 17th. We are talking about 8:00 at  
15 night or so at that point. This is it a--it looks  
16 complex but it really is not. This is the number of  
17 feeders out of service to the Long Island City at any  
18 one time.

19 And this is one feeder out, two, three, four,  
20 five, six and so on. And this is day of the week.  
21 Monday the 17th, Tuesday the 18th, Wednesday the 19th,  
22 to Friday at the end there. What you can see here is  
23 that the first, the secondary cable fire that John spoke  
24 about Monday afternoon, brought us into the second

1 contingency, two feeders out. As we talked about, we  
2 are designed for that, that's not an issue, no problem.

3 That second event that John talked about, the  
4 substation event, brought us up to fifth contingency.  
5 That was Monday evening. The operators then went  
6 through that process to restore feeders. And I just  
7 want to give you a little feel for that process.

8 It generally takes us about 12 or 13 hours to  
9 restore a feeder to service. What's involved in that,  
10 we are talking about, again, 27,000 volts here, so there  
11 is an up front piece to protect the equipment and make  
12 sure it's isolated and grounded so that the operators,  
13 when they go to affect the repair and putting their  
14 hands on what could be 27,000 volts, is absolutely  
15 positive that it is de-energized and safe to work on.

16 So, that process takes time. Then the repairs  
17 are made by the operator and then feeder is restored to  
18 service. That generally in the summer time takes us  
19 about 12 or 13 hours to do that. So, that's what's  
20 happening here.

21 So, this looked like sort of a plateau here but  
22 my point of bringing that 12-hour period up is that  
23 there was a lot of dynamics that was happening. The  
24 operators were battling and struggling to maintain the

1 supply feeders to the network, so there were  
2 restorations occurring and other devices failing and  
3 coming off line. So there was a lot of activity. Even  
4 though this shows something that looks like a static  
5 thing for hours, it is--actually there is a lot of  
6 movement with puts and takes happening throughout with  
7 feeders being restored and feeders coming out of  
8 service.

9 That occurred, that battle occurred for about  
10 24 hours in bringing us to Tuesday evening. And what we  
11 show here is a rapid increase. And we go very quickly  
12 from a sixth to a seventh to an eighth to a ninth and  
13 then even out at a tenth contingency.

14 So, at this point you can see a very short period  
15 of time, but there were ten feeders out to the grid.  
16 Ten of the 22 supply feeders out to the grid. Obviously  
17 very serious situation. Operators understand that. And  
18 again, struggling to restore feeders as quickly as  
19 possible in order to restore the supply.

20 What is also happening during this period, we are  
21 going to talk about this more later, we have  
22 superimposed this blue line, the actual demand or load  
23 that the network is supplying, and that uses the other Y  
24 axis here and it's small. This is 200 megawatt, 250

1 megawatt, 300, 350, 400.

2 I already mentioned earlier that the peak load  
3 for the network that we estimate was about 400 megawatts  
4 for the summer. That's shown--we were around 380 or so  
5 I believe up at that point on Monday. What you can see  
6 here--there is obviously a natural load cycle that  
7 occurs at night where folks are asleep, businesses are  
8 closed, demand comes down, then it comes up again during  
9 the day as folks go back to work.

10 So, what you can see here though reflects the  
11 efforts of the operators. And the other key element  
12 that John spoke about, talk about two, one is quick  
13 feeder restoration time. The other is reduce the load  
14 if you can.

15 That is reflected here. So, there were a number  
16 of things that were going on simultaneously. The New  
17 York State Independent System Operator had initiated  
18 their demand reduction program. We at Con Edison had  
19 also initiated demand reduction programs. We have  
20 customers that actually sign up for program to  
21 voluntarily reduce their demand at any given time.

22 We also had what we call voltage reduction  
23 occurring from Monday evening, and that is where we  
24 deliberately reduce the delivery voltage in the station.

1 That affects all customers. Reduce that by about eight  
2 percent.

3 And so there were a number of measures. Also,  
4 customer appeals directly from Con Edison. And at some  
5 point, I believe starting on Tuesday, there was a Police  
6 Department speaker vans going around actually requesting  
7 folks to reduce load in this network.

8 So there were a number of efforts that were going  
9 on that reflect this. You see the subsequent Tuesday  
10 peak is lower, subsequent Wednesday peak is lower, and  
11 it flattens out about there. The valleys here though  
12 are the night time periods where customers are not using  
13 as much electricity.

14 This battle, as I refer to it, occurred  
15 essentially all week. And you can see we hit another  
16 tenth contingency here on Wednesday about 11:30 in the  
17 morning, and then from there we battle back to restore  
18 stability to the network. And that really occurred on  
19 Thursday and into Friday.

20 On Thursday we had down to three feeders out in  
21 the network and finally on Friday we got within design  
22 criteria back down to two and ultimately all feeders  
23 restored.

24 We showed you this diagram before and we bring it

1 up again to show you the considerations that the  
2 operator looks at when making this decision on whether  
3 to maintain the network or shut down the network. There  
4 are really five, three direct and two indirect. They  
5 are the primary feeder loading.

6 So, if the primary feeders are showing overloaded  
7 what we are concerned about there is the cable actually  
8 heating up to a point where it can actually be damaged.  
9 And then the supply that supplies that life blood of  
10 energy to the network would be damaged and that would  
11 result in long, very long, duration outages.

12 The transformers that we talked about before, if  
13 they show signs of overload on a large scale that would  
14 be another indicator. There is not an equation to this  
15 that we give the operators, but there is guidance in  
16 specification.

17 And then finally, indication of secondary damage.  
18 The secondary cable system we talked about, that grid,  
19 that is the third direct factor that the operators are  
20 looking at when considering whether to shut down a  
21 network or to maintain. The two others, we referred to  
22 both of these, is what's happening with the demand, the  
23 electrical demand load. Is it rising in the morning,  
24 for example, or declining in the evening?

1           And then finally, feeder restoration. Are there  
2 prospects for restoring additional supplies to the  
3 network?

4           I am going to give you a snapshot of what the  
5 operators saw on Tuesday evening at that first tenth  
6 contingency and Wednesday at the second tenth  
7 contingency.

8           Tuesday evening at 8:38 p.m. was the first tenth  
9 contingency. This was the situation the primary  
10 feeders, none of the 12 remaining feeders were  
11 overloaded at that moment. Transformers, there were ten  
12 of the 700 remaining in service transformers where it  
13 indicated overloaded.

14           And with regard to secondary damage, of the  
15 15,000 structures that make up the Long Island City  
16 network, 17 of them we had indication of secondary  
17 damage. So, my point here is to say that these, if this  
18 is the dashboard that the operators are using, this is  
19 not a compelling case to shut down the network.

20           The other two factors that I mentioned before are  
21 the load and the feeder restoration. With regard to the  
22 load, the load was declining. You probably don't  
23 remember, but we do, at that time. That Tuesday  
24 evening, there was a cold front that came through the

1 area dropping temperatures significantly, which has a  
2 load reducing effect. Obviously at night time also I  
3 mention that has a load reducing effect. So, the load  
4 was on the decline. In addition, our load reduction  
5 efforts were in effect.

6 The second is feeder restoration. There were at  
7 this time, there were a prospect of three additional  
8 feeders being restored within the hour. And as you saw  
9 from that just thin line that went up to the tenth  
10 contingency, you saw that we did actually restore three  
11 feeders within the hour to get us back down to a seventh  
12 contingency.

13 This sort of is another way to reflect that. We  
14 show those numbers that I showed on the previous slide  
15 just in terms of percentage. We showed no feeder  
16 overload at that point, one percent of the transformers  
17 overloaded at that point, the ten I mentioned, and  
18 indication of 17 manhole events, which is about point  
19 one percent of the total number of structures.

20 I don't want to beat this point out home, but the  
21 second tenth contingency the Wednesday morning, same  
22 sort of dynamics there. And this, again, same sort of  
23 picture for the Wednesday tenth contingency.

24 Just, again, to show that we then were successful

1 in bringing--restoring the network and stabilizing the  
2 network really on Thursday and Friday, and then could  
3 focus on the task fully, on the customer restoration,  
4 but until the network was stabilized that really could  
5 not be undertaken.

6 Just once again pull up the global map slide and  
7 show the network again. I had shaded before the 25,000  
8 customers were affected over on the eastern side of the  
9 network. Just in the consideration of when we are  
10 shutting down a network what would happen, as I  
11 mentioned, total of 115,000 customers supplied, so there  
12 were 90,000 customers that stayed in service and were  
13 unaffected by the event, by the operators of building,  
14 to maintain this network through the week and stabilize  
15 it again.

16 In addition, there are seven subway lines. My  
17 understanding is all of the Queens subway lines are  
18 supplied and pass through the Long Island City network.  
19 I don't have the ridership of those, I but would venture  
20 to say it's perhaps a million people.

21 In addition, the two branches of the Long Island  
22 Railroad pass through and are supplied from the Long  
23 Island City network. The network had shut down all  
24 traffic signals, street lights were also shut down. So,

1 the consequences of shutting down a network, and the  
2 operators understand, are fully are significant and  
3 real. In particular, the Long Island City network is a  
4 particular transportation hub for New York City.

5 We are going to talk about customer impact now,  
6 which is one of the other big issues. Obviously the  
7 network shut down was a major issue. A lot has been  
8 written and said about Con Edison didn't know about the  
9 number of customers, which is true. I just wanted to  
10 see if I could explain that a little bit, and obviously  
11 talk more about that.

12 I brought this slide back to show with the  
13 overhead system it is one continuous path from the  
14 distribution system right down to the customer. And I  
15 mentioned before, if anything breaks along that way  
16 everything downstream is out. It's like the breaker in  
17 your home or apartment. When that breaker trips all the  
18 outlets and lines downstream of that breaker are out of  
19 service.

20 That's the way the majority of the country is  
21 supplied from a distribution perspective, but on the  
22 network system, we already talked a number of times  
23 about multiple feeder paths and multiple secondary paths  
24 for energy. So, it's really not evident with this

1 system, with this complex system, when a customer is out  
2 of service.

3 We don't have any detection from the customer  
4 perspective. We have no detection from the actual grid.  
5 Although we have monitoring at the area station, we have  
6 monitoring on all of the transformers, once you get  
7 inside this grid here there is no direct telemetering  
8 that tells Con Edison whether a customer is in service  
9 or out of service.

10 When you talked about earlier about reliability,  
11 the vast majority of the time the network customers are  
12 in service. So, the bottom line is we rely on customer  
13 calls to tell us, to inform us, that there is a problem  
14 with their electric service.

15 This is the process that we use to get that  
16 information. And it shows an emergency call coming in,  
17 a customer picking up the phone and saying, Con Edison,  
18 I have a problem. They hear initially a broadcast  
19 message. That could say press one for English, two for  
20 Spanish. It could say, we have a problem in an area if  
21 we know about a general problem in an area. If there  
22 are storms up in the overhead supplied areas, we have  
23 storms and we have a number of customer outages as a  
24 result of that.

1           A customer then has the ability for two choices.  
2           One is to talk to a customer service representative.  
3           The other is to report through self service, through an  
4           automated system we use for a number of things. That--  
5           either one of those will generate a trouble report that  
6           then goes to one of our control centers and then is  
7           dispatched out to an operator for repair. And then that  
8           information is disseminated out to the public.

9           I think I am going to talk about--I will talk  
10          about here just sort of what didn't happen that hampered  
11          some of this. And I am going to talk a little bit more  
12          in the action plan. Initially, there was only one  
13          period where calls--where customers were getting busy  
14          signals. So, that could be considered we are not  
15          getting information. That was on Wednesday for a short  
16          period of time. What we have done is added additional  
17          phone lines to allow that. We've increased the phone  
18          lines by a third.

19          The broadcast message could be considered by some  
20          to be vague or dissuade customers from pursuing it. If  
21          we say we know about an outage customers might say,  
22          okay, we know about it so we don't need to continue this  
23          process. We think many of our customers did that. So,  
24          we have clarified that message to say, to encourage

1 customers to continue on with the process even if we do  
2 know of a general outage.

3 We added capability in this area also,  
4 particularly with self service, and streamlined the  
5 process. It took three minutes to get through the  
6 process previously. It's down to 90 seconds now, so  
7 folks who are impatient will be able to better get  
8 through that process.

9 I'm going to talk about some of the other  
10 improvements later on. This is just to show what that  
11 process that I just showed on the previous slide  
12 generated in terms of trouble reports of customer  
13 outages. And it shows on the 17th that process  
14 generated a total of 17 customers out, 225 on Tuesday,  
15 1100 on Wednesday, and then 1600 on Thursday.  
16 Obviously, vastly underestimating the total that were  
17 affected in particular on Wednesday and Thursday, as  
18 this event proceeded.

19 What we did on Thursday was to divide the  
20 network. This, again, is the grid, and we divided it up  
21 into these smaller grids. And the high lighted areas  
22 are the affected areas. And we actually sent folks out  
23 and surveyed the area Thursday evening when we got an  
24 indication that there was more customers out than we had

1       been estimating.

2               We actually drove through every street of the  
3 affected area with dozens of people, actually, and then  
4 collected that information on Friday morning. And that  
5 resulted, after that was all kind of analyzed, that  
6 resulted in the 25,000 customer estimate being realized  
7 and then shared with the public and the city.

8               Just one other point, that when networks are  
9 in--I said they are in and usually very reliable. This  
10 is just another stat I think that Con Edison gives  
11 insight into the operator's mind that we look back 40  
12 years where networks were actually in service and there  
13 were customer outages.

14              In 40 years, there were four other outages that  
15 were 1000 customers or more. So, in 40 years time we  
16 only had four others that were more than 1000 numbers  
17 out in a network with the network in service. Not  
18 talking about the 2003 blackout or anything like that.  
19 But this, I'm sure, is in the operator's mind that we  
20 don't have large outages when the network is in service.  
21 The network is up or the network is shut down, like in a  
22 blackout.

23              We are going to talk about restoration right now  
24 and Dave Desanti is going to do that.

1           MR. DESANTI: Again, as John mentioned, the first  
2 step really is to stabilize the network, return the  
3 feeders and redirect and reconnect the distribution  
4 capacity, and restore the customers.

5           What we did was we mobilized into three zones run  
6 by Brooklyn-Queens crews and Bronx-Westchester. We  
7 opened up a second workout location in northern Queens  
8 to help the logistical support, and not only our own  
9 crews but crews coming from elsewhere, and also the  
10 bring this down to zones. Helped with the  
11 administrative control of all the personnel.

12           Con Ed did an all hands on effort, brought in  
13 500 company crews, went out to other utilities, out to  
14 Washington, Ohio, Boston, other centers that have had  
15 underground cable crews. 75 mutual aid crews, 50  
16 underground contractor crews, and excavation contractors  
17 to help us.

18           We also deployed a total of 54 energy generators,  
19 particularly during the unstable period in the network  
20 that allows you to restore customers, take affirmative  
21 action, and deload the network to serve customers  
22 faster. We also ran 25 shunts to bypass damaged  
23 sections that we couldn't replace quickly, again, to get  
24 customers back as quickly as possible.

1           With regard to the restoration, display shows the  
2 customer accounts and restoration progress. You note by  
3 midnight Sunday night 80 percent of the customers were  
4 restored and by midnight on Tuesday the customers  
5 restored in the Long Island City network.

6           The recovery effort includes about 500 layouts to  
7 repair and rebuild secondary that was damaged,  
8 installing over 25 miles of secondary cable, installing  
9 about nine miles of new conduit and duct system, we're  
10 enlarging 160 structures to accommodate those vehicles  
11 and replacing more than 25 transformers.

12           MR. MUCCI: Your Honor, we can hold the action  
13 plan for this afternoon. Is that okay?

14           JUDGE STEIN: Let's do that. We are going to  
15 take-- I appreciate your speed at which you accelerated.  
16 Off the record.

17           (Recess taken.)

18           JUDGE STEIN: We will go back on the record and I  
19 will hand the agenda over to staff counsel.

20           MS. HARRIMAN: Thank you, Your Honor. The first  
21 set of questioning is going to be conducted by Michael  
22 Worden and myself and I will let Mike start out.

23           (Panel consists of John Miksad, John Mucci, Matt  
24 Ketschke and David Desanti)

1 EXAMINATION BY MR. WORDEN:

2 Q. Good morning. Just a couple clarifications and I  
3 will let you guys decide who can clarify best. From the  
4 presentation, you mentioned that you had a number of  
5 transformers. Can you explain just for everybody's sake  
6 when you say a transformer, you had seven transformers  
7 overloaded and that was Tuesday night what you mean by  
8 overloaded at that point.

9 A. (Mucci) We determined overloaded transformers by  
10 when the hot spot or top oil temperature exceeded the  
11 calculated hot spot, the calculated temperature exceeded  
12 the design. In some cases 125 centigrade, in some cases  
13 135.

14 Q. So, some of these transformers, correct me if I  
15 am wrong, were possibly above their MVA rating but not  
16 above the temperature rating, right?

17 A. (Mucci) Exactly right. We tested these things.  
18 We knew they could go higher than their name plate  
19 rating.

20 Q. Who's the one on the network shut down?

21 A. (Miksad) I can talk about the network shut down.

22 Q. Can you elaborate a little more on the  
23 discussions that took place Tuesday night, Wednesday  
24 morning, when you were above a sixth contingency

1 regarding whether you should shut the network down or  
2 not.

3 A. (Miksad) Sure. We have two perspectives on the  
4 panel here. I was in the distribution command post at  
5 the time. That gives the overview perspective. And  
6 Matt Ketschke was in the Brooklyn-Queens control center.  
7 You will hear both of them I guess.

8 From my perspective, from the distribution  
9 command post, we had--I had conversations with Matt and  
10 Tom Newell, the vice president of Brooklyn-Queens, on  
11 Tuesday evening when we were in the sixth, seventh,  
12 eighth, ninth. Number of conversations throughout the  
13 evening. Obviously when we were in a tenth, the most  
14 significant.

15 And we talked about, again, the criteria for shut  
16 down. We talked about what the control center was  
17 seeing in terms of those measures that I put up on the  
18 display. Feeder loading, transformer loading, and any  
19 indication of secondary events, which is not a  
20 telemetered measure. It is something that we get from  
21 field reports, either from our folks, from our  
22 employees, or from police and fire department or some  
23 customers.

24 So, we had a number of discussions, I don't know

1       how many through that evening. We had a number of  
2       discussions that just talked about the criteria and  
3       whether the criteria was such, that the contingencies  
4       were such that would prompt a shut down of the network.

5       Q.       Can you, before I hear Matt's perspective, tell  
6       us what the--I think on the first one you mentioned  
7       there were 17 of 15,000 secondary damage conditions.  
8       Can you elaborate what 15,000 represents?

9       A.       (Miksad) 15,000 is the total number of  
10       structures, manholes, service boxes, vaults, that  
11       comprised the Long Island City network. The 17 is a  
12       report of damage from one of those groups that I just  
13       mentioned, either an employee report, a police or fire  
14       report which has a direct line into each control center,  
15       or a call from the public indicating one of those  
16       problems. In an event is either a manhole fire, a  
17       manhole explosion.

18       Q.       The 17 weren't necessarily--were they events or  
19       were they possibly just customer outage from a manhole  
20       or service box, I mean?

21       A.       (Miksad) No. Those were events.

22       (Ketschke) That 17 is really cumulative from  
23       Monday through Tuesday, so, not all of those 17 were  
24       active events at that point in time.

1 Q. Did you get to--were you going to elaborate,  
2 Matt, on what John said about circumstances about  
3 shutting down?

4 A. (Ketschke) My perspective in the Brooklyn-Queens  
5 control center at the time, we are looking at the  
6 estimated restoration time for feeders, what equipment  
7 we expected to restore going through Tuesday evening.  
8 We were in a sixth contingency for the majority of the  
9 evening with the expectation of restoring feeders  
10 throughout.

11 Anyway, as the evening evolved from sixth  
12 contingency, we were looking at what we had for  
13 estimated restoration time for equipment, what we were  
14 receiving for secondary events, monitoring loads on  
15 equipment. As the contingency escalated quickly from a  
16 sixth to tenth contingency we continued to focus on  
17 those things.

18 We were receiving additional calls for reports of  
19 events in the field, monitoring transformer and feeder  
20 coding. The conversations that were going on in the  
21 course of the events as engineering staff would bring in  
22 the analysis of the current situation really revolved  
23 around what to do next, what do we have coming back, and  
24 what other means are available to us to get any

1 additional load off the system. We looked to push load  
2 off for the whole day.

3 There are a series of conversations about--with  
4 going back and forth to the distribution command post,  
5 what we had for available equipment, what we were doing  
6 about considering shutting down the network. And there  
7 was a request made to run cases at the distribution  
8 engineering level, if we were to shut down the network  
9 what to bring back as a state, how much equipment we had  
10 to bring back to restore the network.

11 Q. I believe your report says you determined you  
12 needed 18 feeders to put back. Was that during that  
13 evaluation?

14 A. (Ketschke) That's what the evaluation came out  
15 with.

16 Q. Were you primarily focused at this time on the  
17 primary system, the secondary system, both?

18 A. (Ketschke) At that point--we are talking about  
19 the tenth contingency on Tuesday night. At that point  
20 all the telemetry came back from the field. It was  
21 primarily a feeder driven event. There were outages and  
22 there was secondary events, but the majority of the  
23 concern was on stabilizing the network, yes.

24 Q. Your focus was on stabilizing the primary portion

1 of feeding the network?

2 A. (Ketschke) Yes. Stabilizing, the primary focus  
3 was stabilizing the feeders in the network.

4 Q. Did you get at any time to a state if X happens  
5 we are going to shut the network down? X could be a  
6 number of things, if we lose this feeder, that feeder,  
7 something like that.

8 A. (Miksad) We had a conversation.

9 (Ketschke) We did have a conversation when we got  
10 to the tenth contingency after the next contingency we  
11 would consider shutting down the network. There was  
12 no--all the information we had at the tenth said we can  
13 hold this here. If it continues to escalate you may  
14 need to shut down the network.

15 Because these events evolved quickly, over about  
16 a 40-minute period, we didn't fully complete the  
17 analysis of this feeder versus this feeder or the next  
18 feeder. There were 12 feeders in service in the  
19 network. Some of those feeders would be worse than  
20 others. As we were running through the analysis we were  
21 also trying to restore equipment. We didn't go through  
22 all the remaining equipment, loss of this piece of  
23 equipment, yes. Loss of this piece of equipment, no.

24 (Miksad) My understanding of that conversation

1 was that it was not an automatic if the next event  
2 occurred we would be shutting down the network. My  
3 understanding was that if the next event occurred we  
4 would take--reevaluate and there would be possibilities  
5 of a shut down.

6 Q. You would essentially reevaluate because you had  
7 already done an evaluation whether you should shut it  
8 down?

9 A. (Ketschke) We evaluated at that point. At that  
10 point we didn't.

11 Q. Were there any people that were advocating  
12 shutting the network down within the company?

13 A. (Ketschke) The conversations we had, it was all  
14 part of the discussions, nobody came to--the meetings I  
15 had nobody said we need to shut down the equipment  
16 during any discussion I had in the Brooklyn-Queens  
17 control center.

18 Operations staff and the engineering staff at the  
19 time in the tenth contingency through the evening both  
20 said we can maintain the network in the configuration we  
21 have it now.

22 Q. Again, that's principally looking at the primary  
23 feeder loadings, transformer loadings?

24 A. (Ketschke) Primary feeder loads, transformer

1 loads, secondary events, and then estimated restoration  
2 time for equipment, and the status of where we were in  
3 the load cycle.

4 Q. How about in the distribution command post?

5 A. (Miksad) In the distribution command post most  
6 folks, everyone but one was advocating the maintaining  
7 of the network. One Eli Chablis recommended to me that  
8 we go to a shut down.

9 I took that as a point of information. He shares  
10 his opinion with me freely and that was one reference  
11 point. That goes into the mix with all of the other  
12 operating, engineering advice and information that we  
13 get during these events, but there was one.

14 Q. Was the ultimate damage sustained to the Long  
15 Island City network, how would you compare it to the  
16 damage to the secondary network in Washington Heights?

17 A. (Miksad) More significant than Washington  
18 Heights, I would categorize it. It is my understanding  
19 it amounted total to about four percent of the secondary  
20 system that supplied the Long Island City--that makes up  
21 the Long Island City network. So, about four percent of  
22 the secondary cable sustained damage.

23 So, although more than Washington Heights, still  
24 a relatively small percent of the total number of mains.

1 And that really is where your questioning is going.  
2 That's really what we are looking to attain.

3 There is extensive damage to the network. If the  
4 network grid secondary system burns up or transformers  
5 en masse burn, then we are talking about essentially  
6 rebuilding the network, which is something that could  
7 take us a month, and that really is where the network  
8 shut down decision--that's what it revolves around.

9 (Mucci) Just to add to that. I think in the  
10 Washington Heights event the decision point was when the  
11 station was experiencing damage. At that point, if you  
12 lost a substation you are talking several months rather  
13 than, you know, a month.

14 (Miksad) Right. There was the report of the fire  
15 in Sherman Creek, the substation that supplies  
16 Washington Heights network, and essentially as soon as  
17 that report was received that's when the Washington  
18 Heights network was shut down. That's what triggered  
19 the decision to shut down that network.

20 That was--there was no such substation trouble.  
21 The substation was well within its capability. There  
22 was no issues in the substation.

23 Q. One of the city's responses or one of the  
24 questions had to do with some of your emergency

1 procedures when there are a number of feeders out of  
2 service. It goes into effect I guess when it's greater  
3 than the fifth contingency, maybe something other than  
4 the fifth, but I believe it's the fifth.

5 It specifies when there's a threat of long term  
6 damage to a network. How do you define that, I guess is  
7 my question? Is Long Island City long term damage or  
8 not?

9 A. (Miksad) No. Long term damage is defined as what  
10 I talked about just a second ago where you're  
11 essentially overloading and burning large portion of the  
12 grid. When that occurs, now you are talking about  
13 essentially rebuilding all or a substantial part of the  
14 network, which we said couple times now, that's a month,  
15 month or months long process.

16 Q. How long is the Long Island recovery effort going  
17 to take?

18 A. (Miksad) We are expecting to be completed by  
19 mid-December.

20 Q. Including transformers?

21 A. (Miksad) Including transformers what?

22 Q. Replacements. I understand they are going to go  
23 into the spring.

24 A. (Miksad) There will be some transformer

1 replacements that go beyond. There is some transformer  
2 replacements going on in all the networks.

3 Q. I understand, but it's Long Island City. So, the  
4 recovery took from July whenever to mid-December, which  
5 is a period of months.

6 A. (Miksad) When I was referring to recovery I  
7 wasn't referring to a time where we are going to have  
8 the network back to normal. What I am talking about  
9 with recovery is customer outages for a month.

10 Q. So, just to make sure I understand, you are  
11 saying that if--unless you are going to have significant  
12 customer outages for a period of months it would be your  
13 policy to continue operating the network?

14 A. (Miksad) Long term. Now, six, seven, eight days,  
15 four to eight days of outages are long outages,  
16 obviously, I am not saying that they are not, but in the  
17 scope of things, with regard to the overall network and  
18 the remaining 90,000 customers that are supplied from  
19 it, it was still not enough to trigger a shut down of  
20 the network.

21 JUDGE STEIN: I am a little confused about the  
22 last exchange. Maybe it's just me. And I just want to  
23 for the record make sure it's clear. The question was  
24 when would you consider recovery complete and/or

1 restoration complete.

2 You said roughly another month, or December, but  
3 then were you talking about restoring service to all the  
4 customers in Long Island City, or some other definition  
5 of recovery? If you could clarify that.

6 MR. MIKSAD: The event occurred the week of  
7 July 17th to 21st. We talked about that restoration  
8 time line in the presentation where Dave Desanti talked  
9 about that. It showed that all customers that were  
10 affected by that event were restored by midnight  
11 Tuesday, the 25th.

12 So, the customer restoration was completed on  
13 that Tuesday, July 25th. So, that's what I was  
14 referring to in terms of customer outages.

15 The rebuild and repair of the Long Island City  
16 network continued after that, and it continues today.  
17 And what I was referring to when I answered Mike's  
18 question with regard to the restoration, the restoration  
19 is to complete--to get that network fully within our  
20 design, within design, and all damage repaired,  
21 everything we found as a result of the subsequent  
22 inspection program, to make sure that is all up to spec.

23 When I answered that that will occur through into  
24 December, I said--I meant that we have a group that is

1 dedicated to that. That group is anticipated to  
2 complete their work in mid-December. They would then go  
3 back to their other regions and back into Manhattan,  
4 back into the Bronx, Westchester, and the subsequent  
5 work that Mike referred to with the additional  
6 transformer replacement will be implemented by the  
7 actual normal organization that does that work.

8 But that we consider ongoing work which, as I  
9 said, is occurring all the time, and is shown in the  
10 cycle diagram where we are doing that all the time in  
11 all the networks, but the intense lifting, the heavy  
12 lifting, will be done by mid-December.

13 JUDGE STEIN: Let me, if I may, just follow up  
14 with a question that came up at one of the public  
15 statement hearings last night, and that was kind of the  
16 definition of what restoring the customer to service  
17 means.

18 And when you use that term you would consider a  
19 customer restored to service if they are on a generator  
20 or they are on an emergency back up system? That's  
21 restored to service? This was raised by several  
22 customers at the hearing yesterday, as opposed to being  
23 fully back on your network in the usual everyday sense  
24 of having electricity.

1 MR. MIKSAD: Right. We considered on that  
2 Tuesday evening, Tuesday by midnight, the 25th, we said  
3 all customers were restored. And that was in one of two  
4 ways, either connected to our grid or supplied from a  
5 generator. We then, after Tuesday, after that Tuesday,  
6 through the next couple of weeks, we then proceeded to  
7 transfer all of those customers that were on generation  
8 back over to the grid.

9 JUDGE STEIN: And can you say, do you have a date  
10 at which--by which all customers had been restored to  
11 the grid?

12 MR. MIKSAD: There is a date.

13 JUDGE STEIN: Is it in the past or in the future?

14 MR. DESANTI: It is in the report. It's the date  
15 we had all transformers off.

16 MR. WORDEN: The generators off, and it is in the  
17 record.

18 MR. DESANTI: The generators, sorry.

19 BY MR. WORDEN:

20 Q. One of the things you reported on was the WOLF  
21 model wasn't completely operational, and if you address  
22 those issues going forward.

23 A. (Mucci) We are working on that issue. I think  
24 that issue needs a little explanation. It's quite

1 complicated and took us awhile to understand that in our  
2 analysis.

3 We did a significant amount of analysis to try to  
4 understand what had occurred with WOLF and those systems  
5 related to WOLF. There is three different systems that  
6 use a model to determine activity in the network:  
7 Primary, secondary, and loading. Those three are auto  
8 WOLF, WOLF and PVL. Actually PVL is the underlying  
9 engine under WOLF and auto WOLF. And apparently what--

10 (Miksad) Just to explain to everyone else who  
11 doesn't know what WOLF is, it's essentially a load flow  
12 program that can predict what effects the next  
13 contingency will have on the network. So, it's  
14 essentially a simulator that looks at the next case  
15 scenario and then tells the operators what the load will  
16 be on all the other remaining components in the network,  
17 either the feeder or transformer.

18 (Mucci) Thanks. As additional explanation, these  
19 models are really simulators of our system, and to  
20 simulate such a complex system takes hundreds of  
21 thousands of inputs. So, it's a fairly sophisticated  
22 set of tools that we have for the operators to use.

23 Having said that, during sometime just prior to  
24 the incident, actually July the 12th, our engineers

1 realized that there was something malfunctioning with  
2 auto WOLF. Our people, our technicians worked  
3 throughout the weekend to try to correct that problem  
4 and later discovered that on a new release of  
5 configuration files and loading files this program had  
6 been pointing pointers to incorrect or outdated file,  
7 and that was providing unreliable information, and we  
8 recognized that July the 12th.

9 On Monday, we began to use manual WOLF, which is  
10 basically the same software but operated manually, as we  
11 became--as we continued into the increased contingency  
12 situation.

13 Now, in the increased contingency situation,  
14 manual WOLF did not function properly after the fifth  
15 contingency. That's not unusual because in complicated  
16 simulation software when you are not in a situation  
17 that's been designed and tested you sometimes will not  
18 what we call converge or come together with the correct  
19 results.

20 And that has happened to us in the past and we  
21 have done many things over the years to improve the  
22 software so it will converge. In fact, there are a  
23 number of networks that will converge in the fifth  
24 contingency. Unfortunately, in order to set that so it

1 will converge, you need to have experienced a fifth or  
2 greater. You need to have experienced it in that  
3 particular network, and we had not experienced since  
4 1999 that serious a contingency in New York City.

5 So, we did not converge. The reason it doesn't  
6 converge is because what happens in high levels of  
7 contingency is that the high tension customers would  
8 affect the load curve. Particularly in this event it  
9 was severe because we had asked our high tension  
10 customers to go on generation, and we had a different  
11 load curve than we normally would have.

12 With the industrial, commercial customers  
13 reacting to our appeals, going on their own generation,  
14 LaGuardia switching to the other network, Rikers Island  
15 on generation, the water plant on its own, the load  
16 curve changed radically because you had essentially  
17 lesser or greater--significantly less number of  
18 industrial commercial customers and greater number of  
19 residential customers.

20 Residential customers peak later in the evening  
21 or in the early evening. The industrial customers peak  
22 at 3:00 p.m., a little after that. So, radically  
23 shifted the load curve.

24 Because it radically shifted those curves, it

1 left the operators with results that didn't converge  
2 after the fifth. Operators didn't just give up at that  
3 point. What they did is they took a PVL engine and used  
4 PVL to simulate what they would have gotten from the  
5 WOLF product. And although it's less--somewhat less  
6 accurate that way because you are entering manual  
7 information, they continued to use PVL in through the  
8 remainder of the event.

9 WOLF was corrected, auto WOLF was corrected on  
10 Wednesday at noon; however, because WOLF itself was not  
11 converging into multiple contingencies and Wednesday we  
12 still have extremely high multiple contingencies, we  
13 still didn't get reliable results even at that point.

14 And like our other networks, as we learn this  
15 from on the standard multiple contingency operation from  
16 our experiences, we will improve the model further. And  
17 that's our intention right now is to work on the model,  
18 secondary model, primary model, and WOLF.

19 Q. You have to be in a fifth to be able to correct  
20 the model, to be able to converge after a fifth?

21 A. (Mucci) That's what we are learning from our  
22 experience in the past few years. When we have operated  
23 networks of multiple contingencies, this is what our  
24 technicians are telling us, that you need fifth and

1 above in order to understand how the load curve changes,  
2 how the high tension load curve changes, and how the  
3 customer's load changes in multiple contingencies  
4 situation and then you could simulate it more correctly  
5 with a simulator.

6 Q. Wouldn't it matter which feeders were out in the  
7 fifth to do that?

8 A. (Mucci) You are absolutely right. They  
9 have--what they do is they use the model to get into a  
10 band. It doesn't have to be a perfect simulation of  
11 what exactly is going on. What it is is what it has to  
12 be in a band in order to provide reasonably reliable  
13 results.

14 Wouldn't want operators making decisions on  
15 unreliable results. If not within that band it will not  
16 converge. If you get into a multiple contingency and  
17 you have that data, the experience--you usually can get  
18 close enough to be in that band if it's going to happen  
19 again. We have demonstrated this before.

20 Q. There have been only, my recollection which  
21 obviously isn't your recollection, but probably only a  
22 handful of networks that been in the fifth since '99?

23 A. (Mucci) Very few.

24 Q. That's good. Can you just elaborate, probably as

1 much for everybody's use as for my own, how not having  
2 WOLF available affected what knowledge your people might  
3 have in terms of assessing what was going on when you  
4 were in a seventh or eighth, ninth, tenth?

5 A. (Mucci) We use what we call the pi and  
6 distribution information system to determine if feeders  
7 have overloads. And primary feeders, I am talking about  
8 now. Primary feeders, generally what we do is we  
9 measure the load on the feeder to determine where the  
10 weakest point is. If you exceed that you overload the  
11 primary feeder.

12 The cases of multiple contingencies, you might  
13 have areas that act differently than if you had just two  
14 feeders out. And what might happen is you might have  
15 lanes of a feeder that might not have the same loading  
16 as the data we were receiving on the primary feeders,  
17 but it came to pass that our analysis after the fact  
18 indicated that while there was some primary overloads  
19 for very short durations, there was no extended primary  
20 overloads because there was no failures of joints and  
21 cables because of primary overloads.

22 And we believe from the model runs afterwards  
23 that the pi data was fairly accurate to determine if  
24 primary fields were overloaded.

1 Q. Where were you getting the loads from? The  
2 primary feeders?

3 A. (Mucci) The primary feeders from the pi data.  
4 (Miksad) SOCCX expansion, but from the station  
5 telemetry.

6 (Ketschke) The only other thing, you asked how it  
7 would affect the operators. The work we are able to  
8 utilize are more labor intensive and took slightly  
9 longer for each in duration than the model if the model  
10 had operated. That would be the one big difference, the  
11 other big difference.

12 Q. One of the things in your report I was hoping you  
13 could explain to us talks about how the network  
14 protectors do not operate or its design when the system  
15 contingencies get six feeders and more.

16 Did you know that going into this? Is that  
17 something you knew prior to this? And if so, how does  
18 that affect your mindset as to what's going on out there  
19 and what you need to do?

20 A. (Miksad) I think that is referring to the issue  
21 of alive on backfeed. That--the network protector is  
22 designed. Again, we had--we showed--John showed the  
23 picture on the slide of the transformer and had this  
24 other device kind of piggy backed onto it, which is the

1 network protector.

2 It's basically just a switch that is designed to  
3 operate or for reverse power flow, where it's going in  
4 the opposite direction, the power is going in the  
5 opposite direction than it normally is designed.

6 So, in other words, we talked about the power  
7 supply from the substation, through the distribution  
8 feeder, through the transformer, into the secondary  
9 grid.

10 Alive on backfeed means that the power is flowing  
11 from the grid, through the transformer, back into the  
12 feeder. This comes into play--first of all, the  
13 significance of this, by itself it's not a big deal, but  
14 the significance of this issue during the Long Island  
15 City event was that when a feeder is alive on backfeed  
16 it delays the restoration of the feeders in that we have  
17 got to make sure--as I mentioned, we had the discussion  
18 about processing feeders. We have got to make sure the  
19 feeder is deenergized and isolated and protected before  
20 an operator can touch it to repair it.

21 So, if a feeder is alive on backfeed we have got  
22 to go about finding what is the source of backfeed and  
23 clearing it so that we can go to work. And that's where  
24 this issue comes in.

1           And that we had a number of these things what we  
2 call alive on backfeeds, and the reason that they  
3 occurred was because of a realization post event that it  
4 was damage to the secondary and there was--although  
5 there was a backfeed, it was essentially I would  
6 consider it a trickle rather than a full flow, and that  
7 trickle didn't trigger the network protector from  
8 operating to clear the backfeed.

9           So, I mean, we understand the mechanics and the  
10 physics of it. We had not ever, to my knowledge, I have  
11 been doing this for 25 years, experienced it where it  
12 had--we experienced it so many times I don't remember  
13 the number, but it occurred a number of times during  
14 that week, and the net effect was a delay, some delay in  
15 feeder restoration time.

16       Q.       I guess part of what I was trying to  
17 understand--that was a helpful explanation--what's the  
18 significance of six feeders being out? And is it six in  
19 Long Island City at this point, six feeders? Is it a  
20 different number in a network with 12 feeders? Or is  
21 there some--the six kind of struck me. I didn't know  
22 what the significance of that was.

23       A.       (Miksad) You say the six, you are quoting the six  
24 alive on backfeeds in it. The significance of the six

1 is that that means that six times during that week a  
2 feeder restoration was delayed as a result of this  
3 condition we call alive on backfeed. That's the  
4 significance.

5 Q. I think I misinterpreted my own question, so,  
6 apologize for that.

7 The transformer replacement, I know there were a  
8 number out during the event, you replaced them,  
9 autopsied them and all that. There have been quite a  
10 number replaced since that time in Long Island City.

11 And I guess my question really is more generic.  
12 Is it--I guess I am under the impression a lot of those  
13 transformers are being replaced, not being caused by  
14 what happened in Long Island City, but just because when  
15 you went out and inspected them you found problems with  
16 them; is that a fair statement?

17 A. (DeSanti) As you know, we have been reporting to  
18 you each week a list of every transformer that we  
19 condemned from the system. And since we began reporting  
20 that to you that list has grown to 82 transformers to  
21 date.

22 Now, on that list, which was first delivered in  
23 the report on August 4th, the supplemental report, 18 of  
24 that 82 were pre-event transformers that were off the

1 system prior to the event. Nine were banks that failed  
2 in service. As you know, ultimately there were 13 that  
3 failed in service. Nine were on the list, four had been  
4 replaced, 14 were high gas transformers failed DGOA,  
5 dissolved gas and oil analysis. Five transformers on  
6 that list of 82 were ultimately returned to service  
7 because of cable or other reasons. They were returned  
8 to service. And seven were bushing leaks. They failed  
9 the pressure test but it wasn't a corrosion issue. When  
10 a transformer experiences an overload there is  
11 mechanical stresses on it that cause the secondary  
12 bushings to leak.

13 That leaves 30 failing the pressure test for  
14 corrosion, 30 transformers. And corrosion is one of the  
15 biggest difficulties we have with transformers. The  
16 answer to the question is about 30 transformers were  
17 taken off.

18 Q. Would you--I assume you would expect to find  
19 corrosion issues similar to that in other networks?

20 A. (DeSanti) Yes. All around the system in an  
21 underground system.

22 Q. Are you doing anything special or different since  
23 Long Island City event took place to address that in the  
24 other networks?

1           A.       (DeSanti) We have ongoing programs for corrosion  
2 prevention with our transformers. Back in 1990 we  
3 amended the coating. We have epoxy coating on the  
4 transformer to prevent corrosion.

5                   In '94 we began applying nodes to all  
6 transformers that are installed on the system and more  
7 than half of the transformers in the Long Island City  
8 network have cathodic protection.

9           Q.       I guess what I am asking: Have you done anything  
10 corporately to address the transformer issue different  
11 since Long Island City?

12           A.       (Desanti) No, we haven't. Again, let's look at  
13 the ones we talked about with corrosion. I got it down  
14 to numbers. About 30, I am quoting, based on inspection  
15 of 600 transformers, go in and take the vitals of that  
16 transformer and that gives you a failure rate about  
17 between three and five percent.

18                   And the numbers we quote on our system are about  
19 three percent. It is higher, it's something for us to  
20 continue to look at, but it's not alarming.

21                   (Mucci) We are still--engineering is still doing  
22 the analysis to determine any risk in the transformers  
23 in Long Island City, and we will be looking at our  
24 programs in general. We have a routine inspection

1 program that I believe it's once every five years for  
2 the transformers, and we have also got programs to  
3 provide, through our monitoring systems, additional  
4 information coming back from the transformers, and those  
5 kinds of things, to give us early warnings to problems  
6 and network transformers and we are installing devices  
7 to give us more information over the next couple years.

8 There are programs in place to address some of  
9 the concerns that were in Long Island City and had  
10 existed before Long Island City.

11 Q. The overload rating on transformers, the  
12 temperature rating 125, 135, that is an emergency,  
13 that's your top emergency ratings, correct?

14 A. (Mucci) Correct.

15 Q. I assume you operate a number of transformers  
16 approaching that but not--

17 A. (Mucci) Yeah, not normally.

18 Q. Did your engineering staff look at the loss of  
19 service study analysis on transformers in LIC, or is  
20 that not really something that makes sense?

21 A. (Mucci) I think it makes sense and I think we  
22 are--our intention is to do that. When I say risk  
23 analysis, that would include age. So, loss of life is  
24 something certainly that we definitely should be looking

1 at and monitoring.

2 (Miksad) One point on that. I don't know of  
3 anyone who has ever done loss of life study on  
4 distribution transformers. I think it is done on large  
5 power transformers in substations and things like that,  
6 but it would be something that I don't think any  
7 manufacturer or university or group has ever conducted  
8 in the industry, so, it would be a first if we conducted  
9 it.

10 Q. How were you deciding--did you just figure out  
11 which of the transformers you needed to cool and which  
12 ones were problematic during-- I can think of few ways.  
13 I will let you explain which ways you did that.

14 A. (Ketschke) One of the primary mechanisms, our  
15 distribution transformers have remote monitoring on them  
16 which provides remote telemetry on load. From that  
17 telemetry we have a piece of software that will model  
18 based on system conditions the projected top oil  
19 temperature of that piece of equipment.

20 So, we used that projection of temperature to  
21 prioritize the piece of equipment that we want to go to  
22 to cool. That's the primary mechanism. If that system  
23 is not working, and we are not getting telemetry back  
24 from the field, and there are associated pieces of

1 equipment nearby, and we calculated a pick up or shift  
2 factor for every transformer so we would know how much  
3 load is needed, send a crew to check that piece of  
4 equipment.

5 Q. If I had the transformer with no RMS working, you  
6 would be looking for things like manhole events around  
7 it, or other transformers around it, combination  
8 thereof?

9 A. (Ketschke) We would look for a combination of  
10 particularly other equipment off in associated nearby  
11 area. If electrically nearby transformer was off or  
12 feeder being out, we would want to check the transformer  
13 for several reasons.

14 One, possibly the transformer has high load and  
15 we wanted to get a temperature for field crew. Also a  
16 possibility that the switch or network protector could  
17 be open and we wanted to verify that device is closed in  
18 supplying load.

19 Q. I think you reported that there were about  
20 20 percent of the RMS units were not operational. I  
21 think expected norm is 95 percent. Can you just touch  
22 on two things.

23 One is, what's the basis for 95 percent instead  
24 of maybe, say, a hundred percent, and what's the--how do

1 you get down to 80 percent? How does that happen?

2 A. (Miksad) Maybe I will--we, back in the late '70s,  
3 we took about--undertook the task of actually creating  
4 with the manufacturer Hazeltine at the time. We  
5 developed this system. It did not exist previously.

6 And it's sort of--it was unique at the time,  
7 first of its kind. Other utilities have adopted it  
8 since to some extent.

9 What it does, it's a power line carrier system.  
10 In other words, it sends a high frequency signal from  
11 the sensor that we install on the system, it sends it  
12 through the transformer, over the feeder, back to  
13 substation, and then back to the control center that  
14 Matt's folks operate in.

15 And over the course from 19 early '80s into for  
16 about a ten, 12-year period, we took about installing  
17 25,000 of these sensors and their receiving equipment  
18 and the communication infrastructure to develop this  
19 system.

20 What happened then is Hazeltine was bought out,  
21 the company was bought out by another company, I think  
22 it was British Aerospace Engineers, who was primarily a  
23 military contractor, and one of the things they grabbed  
24 as part of the purchase of Hazeltine was this

1 proprietary system of remote monitoring.

2 It had patents, they were in effect until a  
3 couple of years ago, that would not allow anyone else to  
4 develop the equipment. And they decided--they made a  
5 business decision to essentially exit the business.

6 They would provide some level of maintenance, but  
7 they were not developing the units anymore. So, we were  
8 sort of caught in between. We couldn't get a hold of  
9 the patents until a couple years ago. And they, BAE,  
10 British Aerospace Engineering, was not interested in  
11 continuing this.

12 It was not a profitable business for them. We  
13 were their main customer and there is not many other  
14 folks who do this with the network system.

15 So, over that time frame, despite our best  
16 efforts, the RMS, the reporting rate, diminished down to  
17 a level in the 80 percent, 80 to 90 percent level, and  
18 in some cases networks down to in the 70s.

19 So, what has happened, though, as I mentioned,  
20 the patents have expired now, and we are now pursuing  
21 with two other vendors essentially the new transmitters  
22 and new receivers, so it's the new infrastructure that  
23 we have in place that could actually work and be  
24 maintained going forward. So, that's in place.

1 I should say also that after Washington Heights,  
2 Washington Heights events in '99, we undertook this  
3 program called SUNDAS. And that was another attempt,  
4 sort of in parallel, to come up with the next  
5 generation, the more modern system, very similar to what  
6 we did in the '70s and '80s. And that system proceeded,  
7 we actually installed it in the Hunter network.

8 And what sort of pulled the rug out from under  
9 that program were two major communication issues. One  
10 is that the communication providers, that initially  
11 Verizon and then AT&T, basically discontinued what's  
12 called CDPD Communication Technology, and that was the  
13 platform which we were building SUNDAS.

14 In addition, the CHIPS, the power line carrier  
15 CHIPS that we were using was also--and, again, we were  
16 trying to use essentially cell phone technology for this  
17 system. And cell phone providers make their money from  
18 turning over and coming up with the next generation of  
19 hardware and software, so they have incentive to keep  
20 upgrading and changing the technology and generally they  
21 don't support previous versions.

22 That's okay for a cell phone because folks change  
23 out cell phones pretty quickly, and like 20 to 40 year  
24 life on that doesn't work. So the platform we were

1 trying to build SUNDAS under was kind of pulled out from  
2 under us.

3 So, long winded answer of saying we made a couple  
4 of attempts now. It seems that with the two transmitter  
5 vendors and at least one, perhaps two, new receiver  
6 equipment vendors in the market, now we are in a  
7 position now to push that reporting race up.

8 We are also trying sort of the next--we are still  
9 pursuing the next generation of RMS, which we are now  
10 calling RMSX, and we have an R&D project now to look at  
11 ways to come up with the new system, which does  
12 everything the old system does with enhancements like  
13 additional metering points, not just at the transformer  
14 but pushing down into the secondary itself.

15 So, there are a couple of efforts that are  
16 working to drive up that reporting rate.

17 Q. Based on the breadth of that response would it be  
18 fair to say that it's not a real short term solution,  
19 it's going to take a number of years for really to have  
20 a system out there that's functional for most  
21 transformers?

22 A. (Miksad) To get to the 95 percent level.

23 Q. Or higher.

24 A. (Miksad) Or higher. It's going to take us a few

1 years. That's fair.

2 Q. Kind of related to that in a way, one of the  
3 studies that you had conducted by KEMA talked about one  
4 of the large cities that uses AMR as part of their  
5 system knowledge type stuff.

6 Are you guys looking into--let me rephrase the  
7 question. Are you familiar with that particular city  
8 and what they do? Do they do that on a network? Are  
9 you examining what it is that's out there?

10 A. (Miksad) We actually have committed in the report  
11 that we are investigating AMR. Obviously, there is a  
12 couple of versions of AMR. We are using AMR in certain  
13 places for meter reading purposes.

14 But I think what you are referring to is using  
15 AMR for outage management. I think that's what the  
16 utility, which I believe is Southern California Edison,  
17 which announced within the last month that they are  
18 going to undertake a program to install the outage  
19 management type AMR on I believe the number is five  
20 million customer meters.

21 I don't remember the cost of that program. I  
22 think I remember a couple of billion with a B, but we  
23 have committed to study AMR or outage management for the  
24 Con Edison system.

1 Q. Do you know if anybody uses it on a network  
2 system at all other than Southern California Edison? I  
3 don't know what they have for network grid count.

4 A. (Miksad) My understanding is Southern California  
5 Edison has not installed it yet at all. I think they  
6 are starting, but I know of no network system currently  
7 that has an outage management system type AMR.

8 JUDGE STEIN: Can I just interject a follow up  
9 there. The distinction you are drawing between an  
10 outage management and other forms of data, the outage  
11 management system would simply be like it's on or it's  
12 off, as opposed to more granular data about that meter  
13 or that--roughly?

14 MR. MIKSAD: The AMR that we have in some parts--  
15 we started a program up in Westchester County. The AMR  
16 program that is in place for Con Edison and in most  
17 other places is a meter reading system.

18 Instead of--currently most places actually send a  
19 meter reader person to go and read the meter and then  
20 take down that measurement and it goes into the  
21 computer. What this type of AMR does is basically  
22 replace the need for going inside a person's home to  
23 read the meter.

24 In our version of it, it is a van with radio

1 equipment that can drive down the street and pick up the  
2 meter reading from each of the homes along that street.  
3 So that's the--I would consider that sort of the bare  
4 bones type AMR, purely to substitute a meter reader  
5 going into a home.

6 What we are talking about here is a more  
7 sophisticated system which requires more than just a van  
8 driving down the street in order to know what's  
9 happening at the meter. The van is looking at a  
10 snapshot. As it's going down the street it's picking  
11 the information from that meter, which is purely how  
12 much energy was used since the last reading.

13 What we are talking about here is an  
14 infrastructure, communication infrastructure, that is  
15 continually communicating with all the meters, all the  
16 customer meters. And that information is being sent  
17 back continuously to the utility.

18 That can be used for meter reading also, but in  
19 the case we are talking about here it can be used for  
20 outage management in that when the power goes out to  
21 that meter there is an--it's designed to sort of send  
22 out a last gasp before it dies to say I am out of  
23 service.

24 And that is obviously where Mike I think is going

1 is with that sort of intelligence that we are no longer  
2 relying on the customer to call up and say I am out of  
3 service.

4 BY MR. WORDEN:

5 Q. Are there problems--you are doing it in  
6 Westchester, your deployment, I think I am generally  
7 familiar with that. Are there problems in Manhattan  
8 doing that because of the density of customers or not  
9 necessarily? Do you have plans elsewhere?

10 A. (Miksad) In Manhattan--the reason we started in  
11 Westchester, the best business case is to do it in  
12 Westchester because homes are spread out and it's a  
13 higher cost to read meters in Westchester than it is  
14 Manhattan.

15 If you are in an apartment building and all the  
16 meters are down in the basement the meter reader is down  
17 there looking to read off every meter at one time and  
18 it's a very quick process.

19 So, the per unit meter reading cost in Manhattan  
20 is much lower than Westchester. The best business case  
21 is to do that in Westchester. Whether there's a plan to  
22 install AMR in Manhattan right now, I am not sure.

23 Q. Your focus was strictly on meters and costs and  
24 meter reading?

1 A. (Miksad) That is correct.

2 Q. To date anyways?

3 A. (Miksad) That is correct.

4 Q. When did you start being concerned that there  
5 were more customers out in Long Island City than  
6 somewhere between 1500 and 2000 that your reporting  
7 system was telling you?

8 A. (Miksad) I can start. I don't know if anyone  
9 else wants to chime in.

10 We, on Thursday, the 20th, we opened up our  
11 corporate emergency response center at our headquarters  
12 at Irving Place, and at that time we have periodic  
13 conference calls, either video or audio conference  
14 calls, with all of the operating organizations.

15 The first conference call that we had--I am not  
16 sure of the exact time, but sometime on Thursday after  
17 we opened CERC, our corporate emergency response center.

18 At our first conference call it was the first  
19 time that I heard there was some suspicion that the  
20 customer count might be higher than 1600. And the way I  
21 heard that was I remember Tom Newell, the vice president  
22 of Brooklyn and Queens, saying that he had driven from  
23 the Brooklyn headquarters at Flatbush Avenue over to  
24 Astoria, and in that process he had driven around the

1 neighborhoods.

2 And I don't remember the quote, but I do remember  
3 him saying that, John, it looks like--I just drove  
4 through the area and it looks like more than 1500, 2000  
5 customers affected. And that was the first word I had.

6 He also told me that he had--he knew Matt was  
7 following him over there from, again, from Flatbush  
8 Avenue over, and he had a conversation with Matt to do a  
9 similar drive through the way Tom had done just to get  
10 his perspective as a sanity check.

11 So, sometime on Thursday afternoon was the first  
12 time I had heard that there was something that the  
13 customer count might be underestimated.

14 (Mucci) I could add a little to that. I was  
15 actually in Astoria on Thursday. We had just opened a  
16 remote workout center in Astoria. Matter of fact,  
17 that's what I went there to do Thursday morning in order  
18 to divide up the restoration work.

19 At that point we became concerned that the outage  
20 was larger than we kept thinking it was. Keep in mind,  
21 and what was in my mind at the time was that even the  
22 thought of having two or three thousand people out to us  
23 in a network system is a huge, huge issue. And so we  
24 weren't sparing the focus, but we certainly have systems

1 that were underestimating the amount of people out.

2 And I think we realized that from the reports of  
3 power out, people as well as what our management people  
4 saw, as well as what other reports that were coming in.  
5 I think, like John says, late Thursday morning, Thursday  
6 afternoon, we were concerned and we decided the only way  
7 to really find out is to gather a lot of people and do  
8 something we have never done before and drive through  
9 the network when the sun goes down, and try to figure  
10 out exactly how many people we had, because it was no  
11 easy telemetry from the secondary system to tell us  
12 that.

13 Q. What kind of feedback were you getting on  
14 customer outages from other entities outside the Con  
15 Edison including you said, for example, OEM?

16 A. (Miksad) OEM had representatives in the  
17 distribution command post from Monday through Wednesday,  
18 Monday through Thursday. And then when the CERC, the  
19 corporate emergency response center, opened on Thursday,  
20 OEM had representatives in it.

21 We also had Con Ed representatives at the OEM  
22 headquarters' command post. And I was in the  
23 distribution command post for that entire period from  
24 Monday through Thursday morning, and then subsequently I

1 was incident commander in the CERC, and at no point did  
2 OEM give me any indication that there was any concern  
3 about the customer count.

4 (Ketschke) They did feed to our control center,  
5 they were feeding both OEM -- we have direct lines to  
6 OEM and the fire department. They were feeding  
7 individual pieces of information about small areas, but  
8 nothing that got pieced together into a larger picture.

9 So, while we did get calls from fire departments  
10 or OEM about this block from here to here, or that we  
11 have no traffic signals on this main thoroughfare in  
12 this area, there wasn't an integrated picture of the  
13 whole network and the impact either fed from us to OEM  
14 or OEM back to us.

15 Q. So--

16 A. (Mucci) I think some of the confusion comes from  
17 the fact that if you drove down the block, which I did  
18 Thursday morning in Long Island City and Astoria and  
19 Woodside, you saw stop lights working in some areas and  
20 you saw stores out of service in some areas.

21 It was an odd array of how--it wasn't one of  
22 these things where the whole area is black and everybody  
23 is out, all the lights in the area are out. You might  
24 drive down one block and see the stop light working and

1 you might drive down the next block stores are  
2 operating, stop lights are not working.

3 That comes from the fact that it's a secondary  
4 separates, fuses open, those kinds of things. You will  
5 have isolated areas but there will be areas in the  
6 isolated areas that mesh.

7 That leads to the good amount of confusion when  
8 we drove through the areas trying to understand what the  
9 nature and how widespread it was.

10 Q. For none of you guys, or for whoever you talked  
11 to in your investigation, you didn't come across  
12 anything from OEM that said you way underestimated the  
13 number of customers out, you need to figure out what's  
14 going on, that you are aware of throughout this event?

15 A. (Miksad) That is correct.

16 JUDGE STEIN: Can I ask: The pattern of customer  
17 calls also was not sufficient to indicate how widespread  
18 the outage was?

19 MR. MIKSAD: No. That really is the crux of the  
20 issue. And that's why Mike was asking about the AMR  
21 type outage management.

22 I showed a chart earlier that showed on Thursday  
23 the system that relies on the customer call to go  
24 through that broadcast announcement, talk to a CSR and

1 report an outage. That generated the estimate of on  
2 Thursday 1600 customers without lights, without power.  
3 So, it vastly, by order of magnitude, underestimated the  
4 number of customers.

5 JUDGE STEIN: Is that--to what extent do you  
6 attribute that to what you characterized earlier as the  
7 perhaps somewhat confusing or maybe misleading opening  
8 of your message telling people we know there is an  
9 outage, or to not having sufficient lines or maybe not  
10 recording the calls adequately?

11 MR. MIKSAD: I don't know how many of our  
12 customers hung up because of the confusing message.

13 JUDGE STEIN: Is there any way to know when a  
14 call came in and a person hung up?

15 MR. MIKSAD: We probably have someone who could  
16 answer that question.

17 MR. MCKNIGHT: We do know how many people hung up  
18 either hearing the message and those that also hung up  
19 that didn't get through because it was busy. Busy  
20 signals about 6,000 or so. We also know, based upon  
21 data we got from our carrier Sprint, 85 percent of those  
22 people called back and got through.

23 People that hung up hearing messages, we don't  
24 know exactly who they are because we don't identify them

1 at that point in the processing. It's a phone number.  
2 We don't who they are yet. We have looked at trying to  
3 connect that phone number to an account and we have been  
4 able to say that half of those we can match up.

5 And so that out of 25,000 or so of those calls  
6 during the week, that when people heard a message and  
7 hung up, half of those people we know what account they  
8 were calling about.

9 JUDGE STEIN: Let me make sure I understand what  
10 you are saying. You are saying there was 6,000 callers  
11 who--

12 MR. MCKNIGHT: Got a busy.

13 JUDGE STEIN: Got a busy. But Sprint verified  
14 for you 85 percent of those called back.

15 MR. MCKNIGHT: And got through.

16 JUDGE STEIN: And then but 25,000 got through but  
17 hung up before they said and gave you any information?

18 MR. MCKNIGHT: Correct. But half of those, based  
19 upon their phone number, we can connect them to an  
20 account. The others, we don't know what--it's just a  
21 phone number to us and we don't have that number on our  
22 record, so we don't know who they are.

23 JUDGE STEIN: You can call them. It would be  
24 time consuming. I guess my question is: If you had

1 that, is that a piece of data that could have been  
2 useful, simply 13,000 people called, we don't know why  
3 they called, we never got those calls, but it might be  
4 an indication if that were 13,000 accounts that  
5 suddenly--

6 MR. MCKNIGHT: Let me start by we didn't have  
7 that information at the time. Post events we got the  
8 carrier to provide us information we never received  
9 previously, and we analyzed that data and a lot of data  
10 churned through. That's how we came to that conclusion.

11 We didn't have that data currently. We looked at  
12 getting it more currently post event through the normal  
13 process also.

14 MR. MUCCI: Just to clarify your point, there was  
15 a storm in Westchester at the time so we can't conclude  
16 they were all...

17 JUDGE STEIN: You can't conclude what?

18 MR. MUCCI: We can't conclude these callers were  
19 from Long Island City.

20 MR. MCKNIGHT: We actually conclude that most of  
21 them were not from Long Island City. 15 percent of  
22 those people who we did identify who hung up after  
23 hearing a message were from Long Island City.

24 The remainder of the system, most being

1 Westchester because there was an outage in Westchester  
2 at the same time, on the 18th into the 19th, were from  
3 Westchester customers.

4 JUDGE STEIN: But of the 13,000, did Sprint break  
5 those down by area code?

6 MR. MCKNIGHT: Yeah, but area codes don't always  
7 tell you--718 could be Brooklyn, Queens, Staten Island.  
8 914 could be a cell phone, could be someone in  
9 Westchester. 917 could be a cell phone anywhere.

10 JUDGE STEIN: They did break it down?

11 MR. MCKNIGHT: Yes. We have the numbers.

12 BY MR. WORDEN:

13 Q. Are you familiar--I think Matt would probably be  
14 best suited, but maybe from people in the organization,  
15 the city conducted its own version of the survey  
16 Thursday afternoon to identify the number of problems  
17 out there? And I guess from the puzzled looks I am  
18 getting I guess none of you are familiar with that?

19 A. (Ketschke) No. I didn't get anything from the  
20 city.

21 Q. Are you familiar with the city's--they have a  
22 program called port to assess customer outages going  
23 forward. I don't believe they had it prior to that.

24 A. (Miksad) My understanding is it wasn't in place

1 at the time. Since that time I do understand they have  
2 that program.

3 Q. Do you have your own version of something like  
4 that, since you don't know how many customers are out in  
5 a major event?

6 A. (Miksad) No. And, again, just going to the  
7 uniqueness of this event, is generally when the network  
8 is up and running there are a handful, literally a  
9 handful, of customers out at any one time. You saw in  
10 40 years we had only four times in our history with more  
11 than 1000 customers out with the network up and running.

12 So, that played into it. This generally did not  
13 happen this way. So, going forward we obviously need to  
14 have a better way of determining when this sort of event  
15 occurs. Hopefully it's a one in 40 year event.

16 (Mucci) I should point out we did modify our  
17 systems. We didn't set up like the city to drive  
18 through these, although we could do that, but we  
19 modified our systems to provide us with a conservative  
20 estimate, an early void of significant numbers of  
21 customer outages in the network.

22 And that modification, I can't talk technical  
23 details, but it does take information from transformer  
24 loadings and calls and puts it altogether and provides a

1 conservative, meaning a high, estimate of how many  
2 customers.

3 Q. That's an algorithm I guess we need to get at  
4 outside the framework of this audience, take some time  
5 to understand?

6 A. (Mucci) Yes.

7 JUDGE STEIN: Off the record.

8 (Discussion held off the record.)

9 BY MR. WORDEN:

10 Q. When you did the follow up review, when was your  
11 assessment of when you actually lost 25,000 customers?

12 A. (Mucci) We looked and it's not an exact science,  
13 but we did look at the load that we had--that we didn't  
14 have because industrial commercial customers were off.  
15 We had the benefit of having all the demand meter  
16 information and we estimated how much more that was.

17 So, we can project without industrial commercial  
18 customers what would be the residential load and what  
19 would be the projected load, and then the difference  
20 being two factors.

21 One would be customers out of service and two  
22 would be the impact to customer appeals. Without  
23 knowing the impact to customer appeals, which  
24 anecdotally talked about ten percent, but we really

1 don't know that, we are estimating that after the tenth  
2 on Tuesday that there was a separation there at that  
3 point, and it possibly was most significant the loss of  
4 customers happened Tuesday night and that sort of  
5 correlated to the data we looked at and we received.

6 Q. Starting Tuesday, you escalated up to 25,000 from  
7 Tuesday night through Wednesday sometime; is that  
8 probably fair?

9 A. (Mucci) It's probably true, but probably had more  
10 rapid escalation late Tuesday evening and then another  
11 slight additional escalation Wednesday afternoon, but it  
12 looks like Tuesday evening was the majority.

13 Q. You have, I don't remember the exact number,  
14 somewheres on the order of 30 customers, large account  
15 customers, 33 that you basically disconnected?

16 A. (Mucci) Subject to check. I am not sure.

17 Q. I hope it's not subject to check. On that order,  
18 correct?

19 A. (Mucci) We do have experts that could talk about  
20 that.

21 JUDGE STEIN: Is there someone here? When you  
22 said there are experts, is there someone here?

23 MR. MUCCI: Yeah. Joe Murphy.

24 MR. MURPHY: Your question again, please.

1 MR. WORDEN: My question was: There is something  
2 on the order of 30, 35 large account customers that you  
3 essentially disconnected, my understanding?

4 MR. MURPHY: In our database for Long Island City  
5 network we identified large and what we call sensitive  
6 customers. Approximately about 125 of those, but they  
7 represent, I would say, bringing that number down, about  
8 80 customers, because there is a high number of New York  
9 City Transit facilities, there is Con Edison facilities,  
10 and within that 80 then there is probably around the  
11 order of magnitude that you are speaking about that  
12 represent customers with fairly large demands, with  
13 relatively high demand.

14 MR. WORDEN: I think a better way of asking the  
15 question--maybe I didn't ask the right question. There  
16 is 30 to 35, something on that order of magnitude, spot  
17 networks? Does that sound right?

18 MR. MURPHY: I am not quite sure about that  
19 specifically. I don't know.

20 MR. WORDEN: That you were able to disconnect  
21 from the system?

22 MR. KETSCHKE: I think I understand your  
23 question. There are probably 30 or 35 large commercial  
24 blocks of load that could be separated from the system

1 and moved off, or to something else. There are probably  
2 more than that load that we would classify as spot  
3 networks or isolated networks within our terminology.

4 To answer your question, that's about the number  
5 of large users who would make up the majority of the  
6 load that could be moved off the system.

7 MR. WORDEN: Just trying to get a sense of how  
8 much of the load reductions you had specific numbers on.  
9 For example, those customers that 30 to 35 would have  
10 known pretty much exactly was cut off, the next group  
11 probably wouldn't have had as precise an idea, and the  
12 other ones you just did estimates?

13 MR. MUCCI: That is correct.

14 MR. MURPHY: Even the larger customers, there is  
15 actually a relatively small group of those that have  
16 interval metering that we were able to make some  
17 determinations after the fact of what the actual load  
18 reductions were.

19 There were four customers that were 265, 460 volt  
20 isolated networks and we did deal directly with those  
21 with respect to reducing loads.

22 MR. WORDEN: Thank you.

23 Q. Do you recall when you notified OEM that you  
24 thought there were significantly more customers out than

1 what you were reporting?

2 A. (Miksdad) Well, they were in the room when that  
3 report that I received from--I talked about during that  
4 conference call occurred. So, if they were paying  
5 attention they heard it at that time because everyone in  
6 CERC at the time was around the video screen in that  
7 conference call.

8 So, I don't know. I don't know if they heard at  
9 that time, but that's when they had the opportunity to  
10 hear it as far as from a CERC perspective. And then  
11 obviously, once we said we did our survey Thursday night  
12 into Friday morning, once we learned, once we said from  
13 that 25,000 customers affected, then we notified OEM and  
14 obviously all the other parties, including the media.

15 Q. Right. Did you at any point plot during the  
16 event--I know you plotted customer outages and manhole  
17 events or service box events after the event.

18 Did you at any point during the event plot that  
19 information relative to the Long Island City network?

20 A. (Ketschke) Yes, we did. We began Wednesday early  
21 in the morning to plot particularly manhole events and  
22 outages together. Not specific to address, but into  
23 general geographic areas, knowing the volume of work we  
24 had seen and contingency we experienced, this was going

1 to be a fairly significant restoration effort.

2 And so we began to plot that--those things  
3 together in anticipation of developing work packages  
4 that we would use once the network was stabilized.

5 Q. So, Wednesday morning that plotting was part of  
6 the process for deciding that you needed to create this  
7 team to go out there for the restoration and to work on  
8 that in the three areas and all that stuff?

9 A. (Ketschke) That's how the three areas that was  
10 represented in the slide that showed Manhattan,  
11 Brooklyn, Queens.

12 Q. Even at that point Wednesday morning there was no  
13 indication in anybody's minds from reports you were  
14 getting back from people in the field that there were  
15 more extensive outages than you were reporting?

16 A. (Ketschke) Still the same telemetry of  
17 information that we had. The number of customer calls,  
18 no.

19 Q. But I mean you had a lot of people, I presume,  
20 working on these events. Don't they tell you anything?

21 A. (Ketschke) The primary focus of the crews working  
22 on the field at that point, they were being assigned to  
23 areas to work on primary feeder restoration through  
24 Wednesday, the network didn't really become stable until

1 we got into Thursday.

2 The crews were dispatched primarily to location  
3 to address primary feeder outages. That was the main  
4 focus, and the communications going back and forth  
5 between the call center and field crews really focused  
6 on primary feeder restoration.

7 Q. I want to go back just briefly to clarify on the  
8 discussion about the backfeed current. You mentioned in  
9 the thing, in your report, that contingencies progressed  
10 to six feeders, the network switches didn't have  
11 sufficient backfeed current.

12 That's the question I was trying to get you to  
13 explain, why you didn't have sufficient backfeed  
14 current. I just didn't ask it properly earlier.

15 A. (Mucci) Mostly because of the secondary damage.  
16 There was some--keep in mind any one of the 50 or so  
17 transformers experiences low voltage on the secondary  
18 side could result in that network protector staying  
19 closed.

20 So, if any one of the 50 areas particular feeder  
21 goes through has low voltage or lack of enough energy to  
22 open the protector, you would remain in a situation  
23 where the backfeed remained on. That's what we  
24 experienced in certain areas a number of times.

1 Q. You reported on a number of feeders in your  
2 restoration process and you used the cut in open auto,  
3 and I think the number of them were blamed on the inrush  
4 current issue. I think four of them.

5 A. (Mucci) Four, exactly four.

6 Q. How do you--there didn't seem to be much  
7 categorization of the remaining cut in open autos. I am  
8 wondering what your thoughts are in that regard.

9 A. (Mucci) You know, number of issues arose during  
10 the event. One is that, as I explained before, once we  
11 were in multiple contingencies it was seen as urgent to  
12 return these feeders as quickly as possible to service.

13 In some cases we attempted to reclose feeders  
14 that had come out of service because we didn't see a  
15 relay flag or what is an indication that there was a  
16 fault on the feeder.

17 And in those cases we reclosed--in several of the  
18 cases we reclosed--in two of the cases it was--actually  
19 three it was successful. One came out a few minutes  
20 later so I wouldn't call it successful. Two cases were  
21 actually successful in restoring feeders in that matter,  
22 but there was a number of cases where it was not.

23 The operators in that time made a judgment that  
24 that could save us from additional feeders coming out

1 because the longer the feeder stays out the higher the  
2 likelihood the next feeder will come out. Trying to  
3 avoid a cascade of feeders.

4 There was other issues, too. Some of the feeders  
5 of course had multiple faults on them. You could have  
6 two faults. When you do fault finding our technology  
7 only finds--usually only finds one fault.

8 Sometimes you get reports. If you get reports of  
9 a smoking manhole you could find the second one, but  
10 that's rare. Usually only find one fault at a time.  
11 Then you reclose and find the second fault.

12 Q. The Long Island City network, as I think you guys  
13 know, has a very high level of cut in open auto the last  
14 three or four years. The inrush current only can go for  
15 so much of that. What are the other reasons for that?  
16 What are you trying to do about that going forward to  
17 reduce that rate?

18 A. (Miksad) What really--just the inrush one first.  
19 What really allowed us to detect inrush was because we  
20 installed, I know you are familiar with the system, that  
21 whole power quality node in the substation, which is  
22 this high speed data recorder that records voltage and  
23 current at a subcycle level.

24 That device was only installed--we have been

1 installing them in all the substations, but we just got  
2 the one in north Queens substation, the substation that  
3 supplies Long Island City network, installed my  
4 understanding I think it was weeks before this event.

5 So, once that device is in there recording it's  
6 able to tell us that the breaker opened, but there is no  
7 indication of the voltage and current recordings that  
8 there is a fault on the feeder. So, without that device  
9 there is really no way for an operator to know that the  
10 breaker operated inadvertently.

11 So, that is the information that we now have that  
12 allows us to detect readily that inrush current issue.  
13 I don't know, I don't think we have gotten under the  
14 hood of all of the other reasons for the cut in open  
15 auto, but the only other reason that I could speculate  
16 on is that there was another fault, as John indicated, a  
17 second fault on the feeder.

18 There was, and I believe still is, an R&D project  
19 that is going to attempt to overcome that limitation of  
20 the current fault finding systems. In other words, to  
21 allow fault detection for multiple faults on a feeder.

22 That would certainly be--if that's successful,  
23 that would certainly be a way to address the issue  
24 because now you are finding and fixing the faults in

1 parallel rather than fixing one, restoring the feeder,  
2 and then finding another and restoring it. That would  
3 be something that we are looking to do in order to  
4 reduce the occurrence of cut in open auto.

5 (Mucci) I should add that during the analysis we  
6 had concerns about--because there was so much switching  
7 in this because there was a number of feeders were  
8 restored and came out and restored, that switching  
9 surges could be a cause. And we contracted a company to  
10 study this.

11 They did a modelling of the Long Island City  
12 events and we were not able to prove that fact. They  
13 estimated the voltage which increases on the unfaulted  
14 phase did not exceed the capabilities of our cable. In  
15 fact, they weren't any worse than any other feeder in  
16 the backfeed situation.

17 So, we did study this quite extensively in order  
18 to try to determine why we had multiple faults on some  
19 of the feeders that we believe caused cut in open autos.

20 Q. Did you look back at previous 2005, '4 and '3  
21 that the cut in open auto issue in Long Island City to  
22 see if there was anything there to help explain anything  
23 what happened this year?

24 A. (Mucci) One of the biggest issues that John

1 mentioned is that without the data from the recorders  
2 it's very hard. The other thing I should add is most of  
3 these recorders have been in our other networks. We are  
4 able to now reduce the amount of time it takes to find  
5 the fault with these devices and we believe in the  
6 future we can be doing that for Long Island City, too.

7 Q. What's the--what was the basis for talking about  
8 the inrush current feeders with over 32 MVA or higher?

9 A. (Mucci) We believe that the--that increasing  
10 transformer capacity causes higher inrush, and that's  
11 pretty sure that this would not affect any feeders under  
12 32 MVA. I am using 32 because even at 35 we are  
13 doubtful this will happen. Safety margin of 32.

14 We identified a hundred and--a little more than  
15 130 feeders that fall into this category, so we can  
16 examine the statistical information, number of cut in  
17 open autos, to see if this has been a factor in any past  
18 events.

19 And in many of our networks we do have these  
20 recorders to indicate the more details about supposed  
21 faults we might have had in these networks. We are  
22 using that to go back and study what we had and going  
23 forward we have got several action items to address  
24 that.

1 Q. You mentioned in your action plan that you put  
2 two feeders in prior to next summer in the Long Island  
3 City network, but kind of said it was a good idea so we  
4 are going to put them in. Can you elaborate on that?

5 A. (Ketschke) We are going to take two feeders of  
6 the 22 feeders, two of the feeders that have higher load  
7 on them within their capability, but they are among the  
8 higher loaded feeders in the network.

9 They both serve the portion of the network most  
10 significantly affected by the Long Island City event.  
11 1Q16 and 1Q17. We are going to take those feeders and  
12 split those feeders into--each into two portions. Take  
13 two feeders, divide those feeders, and make four feeders  
14 out of them, serving different geographic areas.

15 Q. 1Q16 and 1Q17 remain in the--

16 A. (Ketschke) There's a new conduit system being  
17 built for the new portions of the feeders branch off,  
18 the 1Q16 and 17 will remain in the duct system that they  
19 are in. That's parallel.

20 Q. How much of that duct system for those two  
21 feeders?

22 A. (Ketschke) For those two feeders, offhand, I  
23 don't know. About 12 percent of our total conduit  
24 system is with duct.

1 Q. And in Long Island City or the systemwide?

2 A. (Ketschke) Systemwide.

3 Q. How about Long Island City?

4 A. (Ketschke) I don't know.

5 (DeSanti) I don't know the percentage, but in  
6 Long Island City we estimate 1.23 million feet of wood  
7 duct in Long Island City. It's a large amount.

8 JUDGE STEIN: If there is a question that you  
9 would like an answer to we can keep a running list and  
10 revisit it at the end of the technical conference. Do  
11 you want to follow up on that?

12 MR. WORDEN: No. That was fine. I am sorry. I  
13 just didn't hear it.

14 JUDGE STEIN: You are just about at the end of  
15 your half hour.

16 Q. You don't have any specific plans to replace the  
17 wooden conduit duct, do you?

18 A. (Miksad) No proactive program is identified yet.

19 Q. When you replace a primary section, let's say for  
20 example paper lead cable, and you are replacing that,  
21 would you automatically replace the duct section that  
22 goes with it, or not necessarily?

23 A. (Miksad) Not necessarily. If the duct or conduit  
24 was instructed then it more than likely be replaced at

1 that point.

2 Q. Same is true on secondary?

3 A. (Miksad) Yes.

4 Q. When you said 12 percent, is that talking about  
5 primary, secondary, both?

6 A. (Mucci) Talking about primary and secondary.  
7 It's the asset value percentage.

8 MR. WORDEN: Counsel says I am done. Thank you.

9 JUDGE STEIN: We listen to counsel. Thank you.  
10 We will move on to the city, give you half an hour, and  
11 take our lunch break and reconvene with a new set of  
12 time lines.

13 (Lunch recess taken.)

14 MR. LOUGHNEY: Ralph Mauro and Tim Taylor will be  
15 doing the questioning.

16 EXAMINATION BY MR. TAYLOR:

17 Q. My name is Tim Taylor and I am working on behalf  
18 of the city, and Ralph Mauro here is also working for  
19 the city.

20 To start off with, we would like to ask a  
21 question about the state of the network in terms of at  
22 the beginning of the event and in which the report shows  
23 that 86 transformers were out of service, which is about  
24 7.2 percent of Long Island City's transformers.

1           Could you elaborate a little bit on the causes  
2 for why transformers are routinely out of service?

3           A.       (Mucci) First of all, there are two ways to see  
4 if a transmission is out of service. One is to  
5 disconnect from the feeder because at some point in time  
6 it failed or was inspected and found to be in the  
7 condition that needed replacement.

8           In addition, there are some times when the  
9 transformer is connected to the feeder but the network  
10 protector is open. And that could happen quite often,  
11 especially in industrial commercial area, because in  
12 industrial commercial areas you might have three banks  
13 supplying a customer and even at peak load you may only  
14 need one or two of those banks, which means one bank's  
15 network protector would be open.

16           That's the normal way it operates and made  
17 redundant to allow for second contingency. You could  
18 have two feeders fail and still not have a customer go  
19 out. And good numbers of those transformers indicated  
20 network protectors were open somehow. I believe 25 off  
21 the system.

22           (Ketschke) Approximately 25.

23           (Miksad) Two other potential ways that might not  
24 have been fully discussed. Another is if there is a

1 portion--a feeder has a fault on it and we do something  
2 called alive end cap. We disconnect the damaged portion  
3 of the feeder from the feeder, and we energize the  
4 remaining portion of the feeder. That would be another  
5 reason why transformers could be out of service.

6 The other one that I am thinking about is if the  
7 transformer network protector has a long fuse, that  
8 would also essentially disconnect the transformer from  
9 the network. I think there is a total of four.

10 Q. Could you clarify the 25 again. I think I did  
11 hear a comment about it's common for customers perhaps  
12 with spot networks to have transformers that are  
13 energized. Is that the difference between the 25 and  
14 the 86 then?

15 A. (Mucci) No. It also includes fuses open, I  
16 forgot that. And that's it.

17 Q. So, the 25 was--

18 A. (Mucci) Actual banks out of service disconnected  
19 from the feeders awaiting replacement.

20 Q. And the 86 mentioned in the report is different  
21 than that?

22 A. (Mucci) Banks not supplying energy to the  
23 secondary system.

24 (Miksad) For all four of the reasons that we

1 recited. So, the 86 is for--as a result of feeder  
2 problem, alive end cap. I am not sure if any of those  
3 existed in this case. A transformer gets connected from  
4 the feeder, blown fuses and open protector because of  
5 low load.

6 (DeSanti) That's 25 out of more than 1200.

7 Q. Correct, right. Is that 25 out of 1200, would  
8 that be a typical percentage that you would see out on  
9 any given network on a summer day? I know you don't  
10 formally keep statistics on that most likely but...

11 A. (Ketschke) That would be a reasonable number,  
12 yes.

13 Q. I guess in developing plans, when you are using  
14 PVL or other programs and you're utilizing the N minus 2  
15 criteria, is there any assumption made as to the number  
16 of individual network transformers that might be out of  
17 service while you're doing the planning studies?

18 A. (Ketschke) No. The PVL planning studies are run  
19 with the assumption of all equipment in service  
20 available. As we make an operating decision to take  
21 equipment out of service, or drop a piece of equipment  
22 off temporary to schedule its repair, that individual  
23 pocket is looked at by engineering staff to make sure it  
24 would still meet the design criteria and be able to

1 supply load in the area for the expected period that  
2 would be off, and it's assigned a priority based on if  
3 it's a high it's more sensitive and less active based on  
4 what else is around it.

5 Q. Shifting gears in a sense, but also bringing up  
6 the question of transformer inrush once again, I hate to  
7 belabor it and actually many of my questions were  
8 answered earlier, but I did want to ask, I just wanted  
9 to clarify: The location of the PQ node devices, are  
10 they monitoring the bus or the feeders themselves?

11 A. (Mucci) Monitoring the bus.

12 Q. Does that present any difficulties in terms of  
13 determining how much contribution is coming from the  
14 feeder as compared to other load currents that are on  
15 the bus?

16 A. (Mucci) We didn't understand the inrush issue  
17 until we put specialized recorders on the individual  
18 feeders. So, the devices that are on the bus of the  
19 station can tell us what the fault looks like.

20 And in some cases when we looked at it we said  
21 this current is too small to be a fault, that it doesn't  
22 have the same characteristics, and that gave us sort of  
23 a pointer something is not right here.

24 And then we added the--I forget the name of the

1 equipment, but we added specialized equipment that we  
2 developed just for this purpose and added it to the  
3 feeder and we were clearer on what we saw. And what we  
4 saw was inrush causing the relays to stop as if it was  
5 an overcurrent.

6 So, it was a very complicated analysis. The  
7 conclusion appears to be sound, that there was  
8 definitely four of the open autos, that was four of the  
9 cut in open autos that was caused by inrush, by that  
10 phenomena, and we have a solution for that.

11 Q. Did the protection people happen to run fault  
12 current studies incorporating possible DC offsets and  
13 comparing those simulated wave forms to the wave forms  
14 that you got from your PQ nodes during the event?

15 A. (Mucci) I believe that's what we did, but you are  
16 getting into areas where I am just on the edge of  
17 understanding.

18 Q. Okay, I apologize for that. I don't want to get  
19 too technical.

20 JUDGE STEIN: Do you want to pursue it and get an  
21 answer to that question?

22 Q. I just wanted to make a further comment. That  
23 was the first time I saw the wave form today and it did  
24 strike me as very similar to a wave form that could be

1 produced by fault current with DC. So I was just asking  
2 to see if the calculations had been made to compare a  
3 calculated wave form with your actual wave forms.

4 A. (Mucci) Okay. We are still studying that whole  
5 issue. Your comment is very helpful. I can pass that  
6 on to people doing the studies. It is a very, very  
7 complicated issue.

8 Q. Yes, it is. I think you have just answered--my  
9 last question was: Are there any plans to do possible  
10 simulations of using a model such as EMTP to look at the  
11 transformer inrush phenomenon and comparing it to a  
12 fault currents with DC offsets?

13 A. (Mucci) We plan to do some modeling studies and  
14 we still got ways to go, but we are in the midst of it  
15 now.

16 MR. TAYLOR: Thank you.

17 EXAMINATION BY MR. MAURO:

18 Q. Good afternoon again. I want to just follow up  
19 on one question Mike was talking about, about these  
20 alive on backfeeds. In the report on page 546 you talk  
21 about three different type of network relays that are  
22 employed in network protectors, microprocessor relay  
23 that can operate with minimum of 13 volts on any one  
24 phase, the solid state model that can operate on

1 50 volts on B phase, and an electromechanical model  
2 requires a minimum of 60 volts on all three phases.

3 Do you have any statistics that show what  
4 percentage of each of these relays are installed in Long  
5 Island City and in Con Ed's system as a whole?

6 A. (Mucci) I am sure we have that data. I don't  
7 have it here, though.

8 Q. I would like to follow up on that, please. Going  
9 on further, on page 547 of that section, it says RMS  
10 telemetry showed voltage as low as 26 volts.

11 With that information, it would imply that  
12 certainly the solid state and the electromechanical  
13 would not have operated, yet three phase grounds were  
14 applied to the feeder in an attempt to clear backfeed,  
15 and that low voltage would indicate that the secondary  
16 could not supply sufficient current.

17 Was that recognized during the event or was it  
18 something that came up after the event?

19 A. (Mucci) We definitely recognized it after we ran  
20 the model after the event. We had suspicions during the  
21 event, but we did not know this was happening  
22 specifically. But we know that in low voltage--we know  
23 when there's low energy in the secondary system that you  
24 run into backfeeds. Any one of the 50 or so

1 transformers could be affected by it, this situation.

2 Q. My question went a little further than the fact  
3 that the protector did not operate. My question really  
4 was: 26 volts--when you recognized that there was 26  
5 volts, that had to give you some indication that it  
6 wasn't sufficient capacity in the secondary to blow a  
7 fuse in the protector, yet three phase rounds were  
8 applied in the attempt to blow fuses. That's my  
9 question. Was that considered during the event?

10 I understand that with the low voltage network  
11 protector relays would not operate. However, my  
12 question really was directed towards the fact that you  
13 had read from your systems that some protectors or at  
14 least one had voltage as low as 26 volts.

15 Would that not have been an indication that the  
16 secondary was somewhat apart and could not supply  
17 sufficient fault current to blow a fuse? And why then  
18 were three phase rounds applied in an attempt to blow  
19 the fuses?

20 A. (Ketschke) I don't know if the specific case that  
21 you are talking about with a known voltage at a point in  
22 the system was recognized by the operators at the time.  
23 I do know that we applied three phased rounds when they  
24 had backfeed conditions in attempt to clear backfeeds.

1           That's normal protocol to attempt a clear a  
2 backfeed using three phase rounds. It wouldn't have  
3 been clear to the operators at the time if that location  
4 had 26 volts was the actually backfeeding location.  
5 Could have been, it might not have been, it could have  
6 been somewhere else where voltage and energy levels were  
7 higher and the operation of three phase rounds would  
8 have cleared the backfeed.

9           The telemetry we get back from the system doesn't  
10 give us a solid indication of the location of the  
11 backfeeding device. In the cases where we had  
12 backfeeds, not knowing where that location was exactly,  
13 we would apply a ground. If that round didn't clear the  
14 backfeed, then the tech men, the other activities they  
15 were engaged in, including cooling transformers and  
16 trying to restore primary feeders, and move those  
17 resources into trying to hit every location and find the  
18 location of backfeed and clear the issue.

19           An indication of the low voltage at a network at  
20 one location wouldn't preclude us from clearing the  
21 backfeed.

22           (Mucci) You have a very good point, but maybe we  
23 should consider looking at that kind of data in using  
24 our systems to be more predictive in what we expect if

1 we cause a ground.

2 Q. You got the point, okay.

3 A. (Mucci) Definitely something we can look at.

4 MR. MAURO: I'll move on to another question.

5 JUDGE STEIN: Before you do, I just want to take  
6 a second off the record to talk about follow up  
7 questions.

8 (Discussion held off the record.)

9 BY MR. MAURO:

10 Q. In regard to the breaker at north Queens that  
11 failed to operate, which puts you into a fifth  
12 contingency, a serious event from what you discussed.  
13 This is in regard to the breaker which failed to operate  
14 in north Queens.

15 There is a figure on page 4-29 of the  
16 October 12th report which shows a circuit which affects  
17 the tripping of this breaker and it shows the  
18 installation of a jumper. It says the jumper was  
19 installed on 4/17/2006; is that correct?

20 A. (Mucci) No. That was--we caught that in the  
21 presentation. We didn't catch that here, but that's  
22 7/17. I am sorry.

23 Q. You make me feel a lot better by saying that.  
24 Thank you.

1           Going on with additional questions with regard to  
 2 the breaker. In the body of the report there was a  
 3 discussion about three indicating lights and a change  
 4 being inadvertently made to make it clearer for the  
 5 operator.

6           In the circuit that's shown on page 429 there was  
 7 only one indicating light and in your presentation today  
 8 you showed two indicating lights, neither one of which  
 9 do I see that is monitoring the trip of that breaker.  
 10 Can you elaborate further on that?

11       A.       (Mucci) I think I can explain it. This--the one  
 12 in the report is a very simplified version of what we  
 13 wanted to express. Contact had a path to keep the light  
 14 lit so operators would not understand the situation.

15           In this presentation, I wanted to be a little  
 16 more thorough to show--to demonstrate the complexity of  
 17 the issue, one, and demonstrate, two, why the design  
 18 error came about. And it was because the two lights--is  
 19 a light--it's not one light, it's two lights. The other  
 20 contact referred to as the SOCCX indication.

21           So, there is actually three contacts, but if you  
 22 just think about it as lights in the substation. The  
 23 designer at the time missed, we believe, and this is  
 24 conjecture because we are not sure, but we believe the

1 reason it was on the same circuit was to avoid the  
2 conflict that an operator may have if one light was lit  
3 and the other light was not.

4 Obviously, that's an error. If the lights were  
5 in conflict it would raise questions. Operators would  
6 say something is wrong and we could have discovered this  
7 sooner. This is a case in some of these breakers, not  
8 all of these breakers, that were installed and  
9 redesigned at one point in time. So, that's the  
10 explanation for it.

11 Q. There were two breakers in the station which  
12 actually failed to operate, and both of them involved  
13 contact number 24 from what I gather.

14 A. (Mucci) That's right.

15 Q. Several questions regarding that then. With  
16 regard to the one for feeder I believe it was 1Q12, that  
17 breaker was inspected and tested in March of 2006, it  
18 operated correctly for fault in April of 2006, and then  
19 it failed to operate in July of 2006.

20 What was done to that breaker? What could have  
21 been done to that breaker to cause that contact to  
22 become misaligned between April of 2006 and July of  
23 2006?

24 A. (Mucci) We don't know a hundred percent, but I

1 think I could explain it a little bit. The contacts to  
2 the breaker of--24 is the last contact on the row. And  
3 the alignment to the contacts was such that top contact  
4 appears to be--the cabinet isn't perfectly square.

5 You know as well as I, the metal they use in the  
6 cabinets can't be perfect geometry. So, to make these  
7 contacts, curved portion to lean up against the  
8 stationary side. In doing that it looks like it cocked  
9 so that the top contact was actually further in and the  
10 bottom contact was out.

11 So, it may be the case that--and this is all  
12 conjecture--the temperature changes, vibration,  
13 whatever, caused this set of contacts to cantilever a  
14 little bit and caused the bottom contact to open.

15 That's probably where the design--where the least  
16 pressure is, the bottom contacts, and in 20/20 hindsight  
17 it would have been nice if it was the top contact for  
18 the relay circuits.

19 JUDGE STEIN: Let the record reflect the speaker  
20 was angling his arm from the bench to show--how would  
21 you describe it?

22 MR. MUCCI: Bending, cocking, tilting to one  
23 side.

24 Q. Going back to this contact 24 which was

1 misaligned in two breakers, what plans if any do you  
2 have to look at the other breakers? And have you  
3 contacted the breaker manufacturer to see if he's had  
4 any other problems of this type anywhere else?

5 A. (Mucci) I know they have contacted the  
6 manufacturer and I know there's potential for the  
7 problem in several breakers in various stations.

8 Our first effort was--which we could do with the  
9 breakers in service--was to fix the supervisory  
10 circuits, and we did that. So, that would give us an  
11 indication if the contacts were open and service would  
12 be open now.

13 That is sort of an immediate fix, but the actual  
14 contact changes or redesign, stiffening of the contacts  
15 a different way to support that structure, and that's  
16 planned, and we will have that in place before next  
17 summer in Long Island City, those breakers in Long  
18 Island City.

19 Q. Do you need to make this temporary jumper fix now  
20 for the remaining breakers in Long Island City so this  
21 doesn't occur in another case?

22 A. (Mucci) In some cases where this is--not all  
23 breakers have this design, the supervisory design.  
24 Where there was we put in jumpers temporarily until we

1 could redesign the circuit, add a light.

2 MR. MAURO: That's all I have on the breaker.

3 BY MR. TAYLOR:

4 Q. Just one last question on the wiring of the  
5 breaker. The report had said it was "inadvertently  
6 wired to serve a single function". It sounds as if the  
7 wiring was done according to the diagram, it was just  
8 that the diagram was not developed correctly, the  
9 functionality that was intended?

10 A. (Mucci) It's hard to understand what exactly  
11 happened at that point because we don't have enough  
12 information to know if it was inadvertent error in the  
13 design. We believe it's in the design, but we don't  
14 have the original drawings that the constructor worked  
15 for.

16 Q. Was the work done fairly recently?

17 A. (Mucci) The work was done in the '90s when we--  
18 well, let me correct that. I am not sure when the work  
19 was done. Could have been done later than that.

20 Started a program in the '90s to remove the fixed  
21 breakers and put these removable breakers in, but we  
22 didn't complete that program until recently.

23 Q. So, there is no way of comparing the actual  
24 wiring with wiring on the diagrams because the diagrams

1 really don't exist, as far as you know?

2 A. (Mucci) As far as I know. We haven't found them  
3 yet.

4 MR. TAYLOR: Thanks.

5 JUDGE STEIN: You are on your last couple of  
6 minutes before we break.

7 MR. MAURO: Shift over to another topic, the  
8 topic of voltage reduction.

9 JUDGE STEIN: You have a couple of minutes. Can  
10 you finish the topic? Why don't we break.

11 (Recess taken.)

12 JUDGE STEIN: Back on the record.

13 BY MR. MAURO:

14 Q. Before we left I had mentioned voltage reduction,  
15 but I would like to hold that for a second and talk  
16 about some of these cut in open autos. On page 413 of  
17 the report you list--you make a statement that the four  
18 cut in open autos that did not display clear evidence of  
19 a fault are--and you go on to list them, yet in each one  
20 there is a statement similar to--something like the  
21 following: Subsequently, a failed cable was found on  
22 the feeder, the failure was on page C. Subsequently a  
23 failed cable joint was found on the feeder. The feeder  
24 failed a full hi-pot but no fault was found.

1           How do you reconcile that after no damage was  
2 found but yet these four instances at least out of many  
3 had damage and faults?

4           A.       (Mucci) That's a good question because it baffled  
5 us for a while too. This is after the fact because at  
6 the time we didn't know yet.

7           When we looked at PQ-node, after the fact we  
8 realized that there was no apparent fault on the feeder,  
9 and what we deduced from the whole analysis after  
10 looking at that and then finding other evidence of CT  
11 saturation during the testing later on, we concluded  
12 that these faults were caused by the DC hi-pots that we  
13 did in order to find the faults.

14          As you know, Ralph, when you find--when you go to  
15 process a feeder and you want to locate where the  
16 problem is, you put--you press high voltage DC on it.  
17 Sometimes you pulse it. You find where it is and that  
18 tells you where to repair.

19          That process is somewhat destructive sometimes,  
20 and we believe these faults were exposed or these  
21 incipient failures came out as a failure after we  
22 applied the DC current and not before. And the  
23 engineers who reviewed this are very sure that there was  
24 no fault of the feeder prior to the cut in open auto or

1 during the cut in open auto.

2 Q. Even with relay targets and PQ-node information?

3 A. (Mucci) The relay targets were caused by the--  
4 conclusion was from the analysis that relay targets came  
5 up, a result of overcurrent was caused by the  
6 magnetizing current. This only happens in some cases  
7 because as the voltage--as the breaker contacts close at  
8 the peak of voltage, you have the highest amount of  
9 inrush current. So you could see in the voltage wave.  
10 If the breaker causes it at a lower point you won't have  
11 that much inrush current.

12 So, it only occurred--it didn't occur every time,  
13 it only occurred at certain times, and that's one of the  
14 reasons why we had not known about this before.

15 And in looking at this after the fact, we  
16 concluded that the inrush magnetizing current was caused  
17 by transformers and cable being energized, magnetizing,  
18 some cases residual flux in the transformer causing  
19 harmonics.

20 In some cases the saturation of the transformer  
21 coils. In some cases--in one case the saturation of a  
22 CT coil causing neutral current. It was concluded after  
23 all the study by two different people studying the  
24 problem that there was--the problem was caused by inrush

1 of the normal feeder operation.

2 And that was after much study, after the fact of  
3 actually putting devices, these measuring devices and  
4 recording devices on specific feeders and seeing the  
5 phenomenon occur.

6 Q. I just want to point out that I used those four  
7 as example, but there are many other examples in the  
8 report of cut in open auto with no damage reported yet  
9 you found faults.

10 So, again, with timing that we have I can't go  
11 into each and every one of them. We will prepare  
12 questions on that.

13 A. (Mucci) When you think about it, when you look at  
14 the full current, if the full current is over 10,000  
15 amperes it's definitely not inrush, but some cases full  
16 current was slightly over the relay settings.

17 If you look at these four--and I think we could  
18 respond to discovery questions and clarify that a little  
19 better with better experts than I am.

20 Q. Fine. We will take it that way.

21 JUDGE STEIN: Before you go on, did you want to  
22 give an answer to our previously asked question?

23 MR. DESANTI: Yes. The question was asked when  
24 were the generators removed. And that was on 8/18 the

1 last generator was removed from Long Island City  
2 network.

3 JUDGE STEIN: Thank you.

4 BY MR. MAURO:

5 Q. Now, I would like to touch on the subject of  
6 voltage reduction. Voltage reduction went into effect  
7 at approximately 18:53 on the 17th, very soon after the  
8 bus section ES open auto. What was the purpose of  
9 voltage reduction and what was accomplished by voltage  
10 reduction?

11 A. (Mucci) Basically we were in a situation where we  
12 are above design. Five contingencies is significant  
13 impact on a network, as you know. To mitigate that, we  
14 have found historically that voltage reduction and  
15 calculated--voltage reduction of eight percent can give  
16 you a reduction of 45 percent in load.

17 And the idea, like I said before, in the  
18 situation, in a recursive situation we were in, there  
19 was only two ways to get out of it: To restore feeders  
20 quickly and to reduce demand. And the idea was to  
21 reduce demand to the network and at the same time we  
22 went and appealed to our major large customers on  
23 generation to do some of those things.

24 I think that was very helpful and part of the

1 reason we were able to keep the network in service  
2 through those contingencies.

3 Q. At the time that you went into voltage reduction,  
4 according to the report there were no equipment or  
5 facility overloads, so at that particular time what were  
6 you trying to accomplish by the voltage reduction? A  
7 reduction in load when you weren't overloaded anywhere?

8 A. (Mucci) It was a preemptive move, basically. We  
9 knew we had five out and I guess that was the first  
10 record hot day of the year and we were concerned.

11 Q. On page 447 of the report there's a graph which  
12 shows load and voltage, and it shows a decrease in  
13 voltage beginning at about 18:53, 18:55, but it takes  
14 over two hours to get an eight percent voltage  
15 reduction.

16 Is that what it normally takes to get a voltage  
17 reduction? And how do you cope with the situation you  
18 have at hand when it takes that long for the voltage  
19 reduction to occur?

20 A. (Mucci) I recall an answer, but I don't want to  
21 conjecture. I don't remember clearly the reason, but  
22 the automated device they use I think had to be adjusted  
23 manually to reduce at the station, so I am not sure.  
24 Let me pass the question. We will find out.

1 Q. Do you know what it should take to achieve  
2 voltage reduction when things are working normally?

3 A. (Miksad) It should be minutes.

4 Q. Can you give a very short description of how  
5 voltage reduction is accomplished when things are  
6 working correctly?

7 A. (Miksad) Sure. It is usually instituted from our  
8 energy control center. An operator essentially presses  
9 a button at a console and selects voltage reduction, and  
10 it sends a signal to the station for all of the in  
11 service transformer tap changers to move down. And that  
12 as those tap changers--the tap changer is a device that  
13 regulates voltage on a day-to-day basis.

14 So what we are doing is overriding the normal  
15 operation of the tap changer and telling it to reduce  
16 the voltage on the substation bus, in this case the 27  
17 kv bus, and when it does that all of the feeders and all  
18 of the transformers and the mains all experienced  
19 reduced voltage.

20 Q. One last thing on voltage reduction. Your  
21 specification E04095 has a suggestion in there, I don't  
22 think it's a must but suggestion that after voltage  
23 reduction is implemented the feeder lines are to be sent  
24 from system operation to distribution engineering for

1 analysis.

2 Was that done? Was an analysis completed and  
3 what were the results of it if it was done?

4 A. (Ketschke) When that specification was  
5 written--there have been some changes in technology.  
6 Actually I think it says feeder loads, not necessarily  
7 logs. You take a snapshot of loading before and after  
8 implementation of voltage reduction to determine you had  
9 the desired effect.

10 Since that spec's been written there is some  
11 additional software mentioned, pi, that takes snapshots  
12 of that information, making it more readily accessible  
13 to both operators and engineers who really are no longer  
14 required to take that 2P snapshot called for in the  
15 spec.

16 Q. So, if I understand what you said right, you no  
17 longer need to do an analysis of what voltage reduction  
18 accomplishes for you?

19 A. (Ketschke) No longer need to do--I thought you  
20 were asking of taking and transmitting the data from the  
21 operators to the engineers in distribution engineering  
22 because the information is more readily accessible  
23 through a different information system.

24 Q. Let me rephrase the question then to make it

1 clearer. The statement in the specification was the  
2 logs should be sent to distribution engineering for  
3 analysis. The operative word there I think in my mind  
4 is "analysis".

5 Was an analysis performed on what effect voltage  
6 reduction did--what it did for you and was it the  
7 desired effect? Has the analysis been done? If it has  
8 been, what are the results? If not, will it be done?

9 A. (Miksad) Sounds like we don't know. So, we  
10 will--

11 Q. I would suggest that it looks like everything  
12 around the megawatts, other things to look at besides  
13 megawatts, currents, load power factor, when that  
14 analysis is done. I think you want to look at some of  
15 those things.

16 A. (Miksad) Yes.

17 Q. That's all I have on voltage reduction. Just one  
18 very quick question on your EMTP study. In the report  
19 you talk about switching surges. Today you talked about  
20 looking at transformer inrushes in further studies.

21 During the inspections of the network protectors  
22 there was a finding in five of the network protectors  
23 network relays were damaged and they could not function  
24 during the inspection. It is not known when they got

1 damaged. It is suspected that they got damaged during  
2 the event due to transience.

3 Are you intending to look at transience on the  
4 secondary to feed this information to the relay  
5 manufacturers and improve on the design, if necessary?

6 A. (Mucci) I think that is a good idea. We hadn't  
7 considered that before. I think it's a good idea.  
8 Definitely bring that back to people.

9 MR. MAURO: Thank you.

10 BY MR. TAYLOR:

11 Q. A few questions just on the background of some of  
12 the larger customers in Long Island City network,  
13 particularly Long Island Railroad, MTA, Rikers Island,  
14 La Guardia airport.

15 Could you describe--and you may not know  
16 this--but in terms of back up generation that these  
17 customers may have, as well as alternate supplies, and I  
18 think you said today that La Guardia does have an  
19 alternate supply from Jackson Heights.

20 But for those customers, those four customers,  
21 could you describe any back up generation that they  
22 might have or alternate supplies, to the best of your  
23 knowledge?

24 A. (Miksad) Joe Murphy could answer that question.

1           MR. MURPHY: With respect to La Guardia airport,  
2 the airport is supplied from two Con Ed substations, one  
3 being in north Queens, which is the Long Island City  
4 network. The other network is our Jackson Heights  
5 network. And the load at La Guardia is approximately 15  
6 megawatts of load.

7           From the Long Island City network we supply  
8 approximately five megawatts of load into what they call  
9 their west substation. From our Jackson Heights network  
10 we supply approximately ten megawatts of load into their  
11 central substation.

12           In meeting with the Port Authority, which we did  
13 certainly pre-summer on certain issues, clearly they  
14 have certain FAA requirements with regard to emergency  
15 back up generation for their control tower, for their  
16 runways, and for some of their PD facilities on site and  
17 their emergency control centers. They have indicated to  
18 us that they have emergency back up generation.

19           The Port Authority doesn't mandate generation  
20 facilities be installed in terminals, nor does the FAA.  
21 It's up to the individual carriers to determine what  
22 level of back up supply they wish to have.

23           And from the feedback we have gotten from the  
24 Port Authority, most of that is targeted towards

1 emergency ingress and egress issues. It is not  
2 necessarily addressed by baggage handling nor HVAC  
3 systems.

4 The opportunity that we have at La Guardia  
5 airport, having been in constant contact with them  
6 through all of this activity, was on Tuesday morning,  
7 although we did have some feeders available to them,  
8 they were experiencing problems with closing in their  
9 breakers because of low voltage.

10 After further consideration and discussion they  
11 contacted us and asked us whether or not we could  
12 support from our Jackson Heights station the transfer of  
13 the five megawatts from their west substation to their  
14 central substation, which they were able to do  
15 internally, and my understanding was that the limitation  
16 of that transfer was really based upon the capacity of  
17 the existing cable that they have within their internal  
18 distribution system.

19 So, they were in contact with us Tuesday morning  
20 at around 11 is my recollection. They asked us for  
21 permission to transfer load. We took a look at that, we  
22 did an evaluation, we got back to them and gave them a  
23 green light to go, and they began that process that  
24 afternoon, concluding I believe around 6:30, 7:00 in the

1 evening when they were able to move their entire load  
2 over to the central substation and theoretically begin  
3 normal operations at the airport again.

4 There are only a handful of other customers who  
5 do have generation. I know that Rikers Island certainly  
6 has generation available to them. Specific amounts, I  
7 do not know. I know we did support them with generation  
8 capability during this event.

9 My recollection is we may have had at least eight  
10 or nine generators that we moved to their facility to  
11 support them. The DEP at the Bowery Bay water pollution  
12 control plant also has significant generation available  
13 to them.

14 During this event we did support them by moving  
15 two two-megawatt generators out to them in support of  
16 their own internal efforts.

17 You had mentioned one or two other customers.

18 MR. TAYLOR: MTA.

19 MR. MURPHY: To my knowledge, I don't have a  
20 great deal of information about what the MTA might have  
21 available as far as generation goes.

22 MR. TAYLOR: And you may not be able to answer  
23 this as well, but in terms of supplying MTA, I think you  
24 have to supply maybe numerous converter stations

1 throughout your network?

2 MR. MURPHY: Right. There are--I guess just to  
3 basically give an understanding, the lines run through  
4 obviously various geographical areas of Queens, and as  
5 they enter into certain areas, specifically our  
6 networks, we then supply their stations. And they  
7 generally have two supply facilities where we have two  
8 27 kv volt feeders supplying their rectifier stations.  
9 They used that power to obviously move the trains along  
10 the route.

11 They have a series of stations in the network  
12 that are supplied by alternating feeders. As the line  
13 extends, the subway line extends beyond the boundaries  
14 of the network, then the next station that they would  
15 have is then supported by the subsequent network in Con  
16 Ed.

17 MR. TAYLOR: Would you happen to know if the two  
18 27 kv supplies to each converter station, are they  
19 operated normally closed, like a spot network, or  
20 normally open?

21 MR. MURPHY: My understanding is that they are  
22 usually both closed and underload.

23 BY MR. TAYLOR:

24 Q. In terms of reenergizing the LIC network if it

1 happened to go down, could you briefly expand upon some  
2 of the complexities that might exist in trying to  
3 reenergize it from I will call it black start?

4 A. (Mucci) There is a couple. If you consider the  
5 fact the number of feeders needed to be repaired, if we  
6 had shut down it would have needed to repair specific  
7 feeders in order to restore the network. We would look  
8 in bands to see if there was enough support to restart  
9 and how many feeders we would need to have to restart.

10 The other complexity, as you know, we had a  
11 number of cut in open autos. In hindsight, one of the  
12 concerns would have been we would have restarted,  
13 feeders would have failed on restart, and maybe had  
14 false restart. Those are some of the things we thought  
15 about after the fact. We thought about the restart  
16 could have been interrupted by the failure of the  
17 feeders.

18 The other issue is high tension. High tension  
19 customers would have to be open for us to restart. I  
20 don't think that's as big an issue.

21 Q. Along the lines of cold load pick up, in which  
22 the load is significantly higher when customers are  
23 reenergized after being out for a period of time, would  
24 that have posed any difficulties in your perspective?

1 A. (Mucci) First off, when we would reenergize, the  
2 network protectors would be in open position. In a  
3 network you reenergize you are only dealing with the  
4 connected load at the moment and that connected load  
5 would be the inrush and the magnetizing current of all  
6 the transformers and cable.

7 However, the customers would not immediately  
8 restart and the network protectors would then close and  
9 you have sort of a second start. And that could be  
10 problematic if you don't have enough feeders and you are  
11 starting and, say, a peak hour, and all the compressors  
12 of all the air conditioners were turned on five minutes  
13 after you restarted, but generally our calculations are  
14 that the network could have been restarted in that  
15 manner if we had enough feeders.

16 Q. Just to change subjects. In terms of the weather  
17 conditions and peak loading on the network, the load  
18 forecast was for 395 megawatts for summer 2006. Was  
19 that forecast value based on your weather conditions  
20 that you would see at your temperature variable of  
21 86 degrees?

22 A. (Mucci) That is correct, yes.

23 Q. From the data that we have gotten through some  
24 interrogatories it looks like the temperature variable

1 was 79.8 degrees on a Sunday, July 16th, and then over  
2 the next two days looks like the highest hourly average  
3 was--the highest hourly average of the wet dry was 81  
4 degrees.

5 Do you know approximately how often you would see  
6 these types of conditions, these weather conditions, in  
7 Queens?

8 A. (Miksad) I could say the 86-degree temperature  
9 variable design criteria is considered a one in  
10 three-year event, and that's a standard that I believe  
11 is conservative. I think the New York ISO uses one in  
12 two-year event design criteria and most other utilities  
13 use a one in two-year criteria, but the specific, the  
14 numbers you quoted for that day, I am not sure how often  
15 they occur.

16 Q. Okay.

17 A. (Miksad) And that was apples and oranges. The  
18 wet dry is not the temperature variable.

19 Q. Correct.

20 A. (Miksad) One is wet dry hourly average and the  
21 other is temperature.

22 Q. But I believe the temperature does consider the  
23 wet dry average?

24 A. (Miksad) Absolutely. Three-day weighted average.

1 Q. Correct, right.

2 A. (Miksad) We just did not have that information  
3 yet, so that's why I was using that value. In terms of  
4 planning for next year, this year's actual peak was 381  
5 megawatts. I know you apply a weather adjustment factor  
6 based upon your actual weather conditions that we are  
7 seeing that will adjust it to your design variable of  
8 86 degrees, what is the projected forecast for next year  
9 for LIC based upon what we are seeing.

10 (Mucci) I know it's not about 395. Exactly what  
11 it is, I don't remember, but slightly below that,  
12 slightly below the projected peak for this year, what  
13 the adjusted peak was.

14 (Ketschke) I think that was a slightly different  
15 question.

16 (Miksad) The forecast has been generated. We  
17 just don't know what that number is, but we definitely  
18 can get it for you.

19 Q. I was thinking it would be significantly higher  
20 than this year since the peak weather conditions did not  
21 approach the 86 degrees temperature variable.

22 A. (Miksad) Generally I know we have experienced  
23 about a two percent annual growth in Long Island City.  
24 I would expect it to be about two percent higher, but if

1 you asked--

2 JUDGE STEIN: Let's wait and get the number on  
3 the information request.

4 Q. Last question. The wording of action 16A was  
5 just a little unclear. It has to do with the additional  
6 area substation. I think the intent was to say that the  
7 study, that the actual study, would be completed by  
8 summer of 2007 and not the construction of a new  
9 substation.

10 A. (Miksad) That is correct.

11 Q. In considering whether or not a new substation  
12 should be accelerated and the development of a new  
13 network, which would take some of the load from Long  
14 Island City, what are some of the considerations that  
15 you look at in deciding whether or not those facilities  
16 should be accelerated?

17 A. (Miksad) Yeah. The criteria that we use  
18 currently for when a new substation is required, there  
19 is really only one right now and that is the demand, the  
20 electric load on that substation.

21 So, we do each year, when we go through this  
22 cycle of the summer we then update our ten-year load  
23 forecast for every individual station and every  
24 individual network, so we are looking out ten years.

1           When the load--the substation exceeds its  
2           capability, that's where we are always looking to do  
3           either reinforcement of the substation, a transfer of  
4           the load to balance load, or the creation of a new  
5           station prior to the need. And that is the criteria.

6           Now, what we proposed in this case would be the  
7           first time we were actually looking not just on need,  
8           because on load need would be out in 2015, so we are  
9           saying let's look at the benefit with regard to  
10          reliability benefit, what it would do for reliability  
11          performance.

12          Q.       This is my last question I think. When you say  
13          reliability, I assume that you are talking about the  
14          programs, the risk of feeder outages, because obviously  
15          if you build a new substation and have two networks you  
16          then have shorter feeders and less on a reduced  
17          exposure, reduced feeder failure rate and perhaps CIOAs,  
18          was that your thinking?

19          A.       (Miksad) That's absolutely correct.

20          BY MR. MAURO:

21          Q.       I have just one question. In section three of  
22          the report there are quite a few maps which give a very  
23          good depiction of what went on during the five or six  
24          days.

1           Are these maps available in real time to the  
2 operators in the Brooklyn-Queens control center?

3           A.       (Miksad) Not currently, but they will be. That  
4 is part of our plan.

5           Q.       When you look at the maps, that's why I asked the  
6 question, as early as 15:18 and 15:14 there are clumps  
7 of customer outages. When these maps were plotted by  
8 Brooklyn-Queens engineering beginning on the 19th, were  
9 those clumps recognized as being there has got to be  
10 more out there even though we just got these numbers of  
11 calls?

12          A.       (Ketschke) The maps that are represented in the  
13 report integrate information from several sources,  
14 including customer outages, equipment out of service.  
15 The maps that were plotted or applied by the engineers  
16 did not integrate all this information into one package.

17                 We will have that ability. They didn't have the  
18 ability at the time. That was not done, integrating all  
19 the things you see in the report into one representation  
20 real time during the event.

21                 JUDGE STEIN: I think that your time has come to  
22 an end, and I thank you very much for all your work. I  
23 actually have a question of my own which follows on some  
24 of the previous questions. I am going to ask it now,

1 take a quick break, and run through the dance card for  
2 the rest of the afternoon.

3 I actually want to follow up on the questions  
4 about temperature, because the report talks about the  
5 heat wave condition that set the stage for the outage,  
6 and there's a considerable discussion about preparation  
7 for heat events, preparation for summer load  
8 forecasting, and so on. I have really two questions  
9 that are related.

10 The first is to what extent did the heat wave  
11 conditions and both the heat itself and the resulting  
12 load spike contribute to the cascade of events that you  
13 have described? And second, as a result if in your view  
14 it did contribute significantly, is the company  
15 reviewing its measures to manage customer demand in any  
16 kind of global way?

17 MR. MIKSAD: The heat and the load that result  
18 from the kind of temperatures we saw that week are  
19 definitely a backdrop to an event like this. A fifth  
20 contingency, you know, that occurs at midnight on a  
21 Sunday morning on a cool weekend is the load and heat of  
22 the system are at a much lower level.

23 The system is much less stressed and we have  
24 survived through those sorts of events historically

1 without impact to customers. It is a compounding  
2 effect. It is definitely a part of this picture,  
3 despite the fact we have redundancy built into the  
4 system, but we far exceeded that demand time management  
5 that's a part of our portfolio right now.

6 And there are a number of different programs that  
7 are currently in place. There is an--I guess there is a  
8 couple of categories. Con Edison has demand reduction  
9 programs, the New York Independent System Operator has  
10 demand reduction programs, and NYSERDA also has demand  
11 reduction programs.

12 And then there are a couple of different  
13 subcategories of those programs. There are targeted  
14 plans that Con Edison has these--where we see the load  
15 in a particular area growing very quickly. What we will  
16 do is actually work with, go out to bid with  
17 contractors, and we will pay them to go out and retrofit  
18 buildings, first market themselves and retrofit  
19 buildings.

20 And retrofit, I mean changing of outlying to high  
21 efficiency motors, changing out motors to high  
22 efficiency motors and things like that. Actually  
23 reduces demand and pushes off investment in the  
24 transmission and distribution system. It's targeted to

1 particularly high growth areas.

2 Con Edison also had another type of program and  
3 the ISO, the Independent System Operator, does as well.  
4 These are the programs I referred to during the  
5 presentation, and that is where customers actually sign  
6 up in advance and volunteer to reduce load on request.  
7 And then they are paid for that, actually get  
8 reimbursement for that. They are voluntary.

9 There are some versions of the program that do  
10 have penalties associated with that, but still they are  
11 voluntary. They don't--they are not guaranteed  
12 reductions. So, there is some probability that you will  
13 not actually get the reduction when you ask for it,  
14 which is a concern, because that is not equivalent to  
15 capacity.

16 When you install capacity you have that there.  
17 If you have a voluntary demand side program you don't  
18 necessarily have it there. You might have it there.

19 So, that's another version. So, the difference  
20 between those two types I just talked about where  
21 vendors, contractors, are actually changing motors, you  
22 actually--that's really that's a solid. That's  
23 equivalent to capacity. It's just customers turning off  
24 motors or reducing a thermostat. That's something you

1 don't have a guarantee you are going to get.

2 So, there are a number of programs in place. It  
3 actually adds up to a sizable amount of megawatts. I  
4 haven't done the math, but looks like about 500 or 600  
5 megawatts of load reduction in the Con Edison service  
6 territory.

7 Remember we talked about on a basis of 13,000, so  
8 about 600 reduction in programs that are at some stage,  
9 either signed up or in progress of being signed up. So,  
10 it is a part of the picture now and it did help us  
11 during the event but...

12 JUDGE STEIN: Let me just follow up. I am not  
13 going to take any more of the parties' time, but I know  
14 that there are relatively recently decided and ordered  
15 Commission programs, company/Commission programs for  
16 demand reduction.

17 I guess my question is: Is this an area that is  
18 under active reconsideration by the company at this time  
19 in the context of the backdrop of heat waves and the  
20 potential contribution to serious outage events?

21 MR. MIKSAD: I don't know if demand side  
22 management is going to be the solution. Just one  
23 example is when the--let's say these programs, we have  
24 got 40 megawatts of load reduction in a particular

1 network. What is done, it has postponed necessary  
2 investment, has postponed investment in the T&D system.

3 It is also obviously environmental benefits,  
4 greenhouse gasses and all that. So, taking those aside,  
5 we are talking about reliability here, but we would  
6 still--the load is 40 megawatts lower, essentially we  
7 would reinforce the system to a level that's 40  
8 megawatts lower so it doesn't necessarily increase your  
9 cushion or margin on the system.

10 So, I don't know if that's the be all and end all  
11 solution to reliability.

12 JUDGE STEIN: Thank you.

13 MR. LUBLING: If I may note the primary vehicle  
14 for demand side management in New York State is NYSERDA  
15 and all of our customers pay a system benefits charge.  
16 It does have several programs for Con Edison as well as  
17 NYSERDA.

18 We also have six or seven tariffs, special demand  
19 side management programs, and under our current rate  
20 plan the plan is to reduce load by 675 megawatts within  
21 the three-year rate period.

22 JUDGE STEIN: Thank you. Representatives from  
23 Power for the People for questioning.

24 EXAMINATION BY MS. BONILLA:

1 Q. Hi, everyone. My name is Alyssa Bonilla. I live  
2 in Sunnyside, Queens. I am a part of Western Queens  
3 Power for the People Campaign.

4 First let me say that we strongly object to the  
5 continued reference to the outage as an event and to the  
6 customers affected and reference to customers affected  
7 and not people affected. For those of us who  
8 experienced this outage it was not an event, it was a  
9 disaster. Using these terms feels to us as minimizing  
10 our experience, so it's very important for us to add  
11 into this discussion even at the technical level that  
12 all these decisions and steps have consequences that  
13 affect people. These are not just pieces of metal that  
14 we are dealing with. The end is a human being.

15 Now for my questions, and please forgive me if  
16 they are seemingly simple or stated or answered  
17 elsewhere.

18 Regarding the fire that started in Astoria, I  
19 recall your summary of the report mentioned it was  
20 started by a short circuit in a low voltage cable. Can  
21 you let me know how old that cable was.

22 A. (Mucci) We do have that data. I don't have that  
23 data right here right now. We will have to get back to  
24 you with that.

1 Q. How does that happen? How do you get back to us?  
2 How does that happen?

3 MR. LUBLING: You are a party to the proceeding.  
4 We provide you and all the parties with an answer to  
5 that question.

6 MS. BONILLA: Thank you.

7 Q. The component that had the faulty contact, how  
8 old was that component?

9 A. (Mucci) 2002.

10 Q. When you reference 25,000 customer estimated to  
11 have been affected by the outage, how do you define  
12 customer affected? Completely zero? No power  
13 whatsoever? Or low voltage? Or both?

14 A. (Miksad) There is actually two parts to that.  
15 First of all, a customer to us, as we described in the  
16 report and in this discussion today, is a meter, is an  
17 account.

18 In other words, we don't count the number of  
19 people who live--number of people in a family or in an  
20 apartment or the number of people in a home. We count  
21 the account. That's the first thing.

22 Second of all, the outage numbers we quote are  
23 outage, not low voltage.

24 JUDGE STEIN: So total out?

1 A. (Miksad) Total out, yes.

2 Q. In my particular case in my apartment in one room  
3 we had a light bulb that was very brown and we could  
4 plug in a T.V. and we kept on for information. You are  
5 saying we would not have been counted because our meter  
6 was technically still running.

7 A. (Miksad) That is correct.

8 Q. Wow, okay. Are there plans to do an actual count  
9 ever? Do you have any plans to actually count the  
10 number of people affected? Do you have plans to do some  
11 sort of poll or counting?

12 A. (Mucci) We thought about that because I guess one  
13 of the issues was that multiple--good number of people  
14 affected that are not direct customers; however, we  
15 believe it would be an imposition on people's privacy to  
16 be asking them to tell us how many people are behind the  
17 meter, how many people in any particular apartment, and  
18 we didn't see that as being as useful as the estimates  
19 we made.

20 And the estimates could be made off of census  
21 data and things like that, but generally to ask people  
22 who's living in the apartment or how many people in  
23 their building, we didn't see that as a benefit to  
24 anybody.

1 Q. You referred to the network in Long Island City  
2 as being a level two contingency network. Are there  
3 networks that are greater than level two that have a  
4 larger redundancy than two feeders? Does this exist and  
5 are there any in New York City if they did?

6 A. (Miksad) All of our networks are designed to the  
7 same design criteria, essentially N minus two.

8 Q. Do higher levels than that exist? Is it  
9 possible?

10 A. (Mucci) Not by design. It's possible as load  
11 doesn't grow in a particular area and grows in other  
12 areas that you might have a little margin, but generally  
13 our design is N minus two in New York City.

14 (Miksad) Nor do I think, by the way, any other  
15 utility does anything greater than N minus two.

16 Q. That's the question. Thank you. As we know,  
17 portions of the network failed and portions of the  
18 network survived this outage. The remaining cables, the  
19 ones that didn't fail that are still in place that  
20 haven't been repaired or replaced, are they more  
21 vulnerable to future failure due to the stress they  
22 incurred?

23 For example, in certain materials you can have  
24 stress without failure, but that is more vulnerable to

1 stress or failure in the future. Are those components  
2 in greater danger now?

3 A. (Miksad) We are actually--since the event we have  
4 been out, you may have seen us doing inspections,  
5 diagnostic testing and maintenance replacement or repair  
6 of anything that we find to be defective.

7 Now, I guess to your point, could there be  
8 incipient failure that we don't know about, I suppose.  
9 The diagnostic tests we use not just for Long Island  
10 City but for the entire system are not a hundred percent  
11 foolproof.

12 It's not--I guess you could say it's like an EKG.  
13 You could pass an EKG and drop dead of a heart attack in  
14 a week, but that's sort of the same thing with the  
15 system. We could take a diagnostic. It passes that  
16 diagnostic but we still experience failures on the  
17 components that we have done diagnostic tests on to a  
18 lesser degree.

19 And that's why we do the diagnostic tests, but  
20 it's not a hundred percent guarantee, but we do have--I  
21 think everyone would say we have a high degree of  
22 confidence when we are done with the Long Island City  
23 network, we will be by next summer, it will be in very  
24 good condition.

1 EXAMINATION BY MR. BARNHART:

2 Q. My name is Patrick Barnhart also with Power for  
3 the People in Western Queens. I am a resident also of  
4 Sunnyside, Queens.

5 My question relates to the previous question.  
6 And I am wondering if in terms of the network maybe we  
7 can--if you considered a demand side management program  
8 like you were discussing earlier, specifically for the  
9 Sunnyside or Long Island City network?

10 A. (Miksad) No additional programs. I mean these  
11 programs, some of them are targeted systemwide so some  
12 of that may impact and help the Long Island City  
13 network, but we haven't taken some additional effort to  
14 further reduce load in the Long Island City network.

15 One of the things in particular in your area,  
16 it's difficult when we are talking about two story  
17 buildings, mostly residential, small commercial. Most  
18 of the demand side management programs that exist today  
19 are really targeted toward commercial, large commercial  
20 industrial company, buildings.

21 And although Long Island City does have some of  
22 that in portions of the network, there is a good deal,  
23 as you know, of industrial commercial, small  
24 residential, which is just tougher for a couple of

1 reasons.

2 It's a very small--you have very small amounts of  
3 load, so you are reducing, you are making very, very  
4 small reductions and got to get a lot of it to add up to  
5 something significant.

6 Also, I would say it's a challenge to attract  
7 some of the contractors that we talked about to target  
8 residential and small commercial areas because it's a  
9 lot of work for them. They have got to go basically  
10 door to door in order to get subscribers, as opposed to  
11 coming to one large building like this one and having  
12 one point of contact and getting a lot of reduction on  
13 all of these floors.

14 Q. Perhaps somewhat related is that at least 50 of  
15 the customers that you talk about were large condominium  
16 and co-op buildings. When those buildings called to  
17 report an outage does it--the super is calling from  
18 those buildings, does it count as different customers or  
19 one customer? You are talking about 400 people and  
20 significant demand load.

21 A. (Miksad) Right. As I say, we consider a customer  
22 to be an account. So, if--let's take the apartment,  
23 your apartment building scenario. There are some  
24 apartment buildings that have one meter. We call them

1 master meters.

2 If there is one meter we would consider that  
3 apartment building with, to use your example, 400  
4 tenants to be a customer. That is not usually the case.  
5 We moved away from master metering and we are--most of  
6 the apartments are individually metered.

7 And the reason for that is, again, to have  
8 customers see their bill and to be able to adjust their  
9 usage accordingly, whereas with a master meter it's sort  
10 of you got the middle person in between the customer.  
11 So, if there are 400 meters in the apartment building  
12 there is 400 customers. If there's one meter it's one  
13 customer.

14 Q. I have a question related to your contingency  
15 levels and the lack of field surveys until Thursday.

16 JUDGE STEIN: I wanted to follow up on the  
17 question of the metering because--I am sorry to break  
18 into your train of thought, but I think I heard one of  
19 you say or read that you use a rough estimate of four  
20 people for one account or one customer for a meter. You  
21 might estimate roughly four people would be involved?

22 MR. MUCCI: We don't try to make that estimate  
23 because we are not sure how many people live in any  
24 particular apartment. That has been estimated by

1 ourselves.

2 JUDGE STEIN: Is that just the New York Times? I  
3 can't try to defend it, can I?

4 MR. MIKSAD: No. The print media has come up  
5 with that four to one ratio based on an average of four  
6 people per family.

7 JUDGE STEIN: Thank you. So actually we don't  
8 know how many people were affected by the outage?

9 MR. MIKSAD: That's true.

10 BY MR. BARNHART:

11 Q. In terms of the field surveys, has there been any  
12 consideration to in the future when you reach a certain  
13 contingency level and summer time, which obviously is  
14 going to be a higher demand for power, to starting a  
15 field survey once you reach a certain contingency level?

16 A. (Miksad) It's something we will definitely  
17 consider. What we have done in the short term and  
18 alluded to earlier, we have developed this algorithm  
19 that doesn't only rely on customer calls, it looks at  
20 field contingencies, number of feeders out of service,  
21 and secondary damage reports to provide not an estimate  
22 of algorithm, give a pi side trigger to alert the  
23 operator something is going on in the area that would  
24 initiate a survey to say what's going on in this

1 particular area.

2 I think that was Mike's point earlier with regard  
3 to what the city is doing with the port team. I think  
4 it's something that we can do given--until we get real  
5 good intelligence directly from the customer, a good  
6 interim step.

7 Q. Finally, I mean in your initial part of the  
8 presentation with the power point there was a suggestion  
9 that--at least what I took from it was the network was  
10 basically saved in order to--or not shut down because of  
11 the large customers such as MTA and Long Island  
12 Railroad. Is that Con Edison's position that was the  
13 main consideration in not shutting down the network?

14 A. (Miksad) No. The reason we didn't shut down the  
15 network was because, first of all, it did not--the  
16 criteria that we are looking at, which we talked about  
17 earlier to be feeder loading, transformer loading, and  
18 indication of secondary damage, as well as what's  
19 happening with the demand of the network, whether it's  
20 rising or declining, and the feeder stats, whether  
21 feeders are scheduled to be returned to service in  
22 certain short period of time.

23 When looking at all of those factors we felt that  
24 we could maintain the operation of the network. Now, in

1 the back of our mind is always the consequence of  
2 shutting a network down. It is a big deal.

3 I understand 25,000, including you two folks,  
4 were out of service. And it was a big deal and you  
5 described it as a disaster and I understand that. I  
6 don't know if you were out for five days or six days but  
7 that is a long time to be without electricity. We do  
8 understand that.

9 One of the reasons we show those reliability  
10 slides is we do take great pride in the level of  
11 reliability we provide to our customers, but the  
12 shutting down of the network with 90,000 other customers  
13 affected, again, using our definition of customer, not  
14 people, as well as the transportation hubs, is a  
15 definite consequence of shutting that network down and  
16 is in the back of all of our minds when we are looking  
17 to make that decision.

18 BY MS. BONILLA:

19 Q. From where I sit in my experience I need to  
20 communicate to you that I am perceiving a tremendous gap  
21 between what you are asserting was your level of  
22 concern, your level of diligence, your level of action  
23 to mitigate this what you term unprecedented situation,  
24 this tenth level contingency.

1           In the summary report you do mention it went as  
2 high as 13. I kind of wondered what happened to the 13  
3 in the presentation there, but that's an aside. I am  
4 perceiving this gap between this sense you were there,  
5 you were in the field, you were on top of the situation,  
6 and then on the other hand this communication to us that  
7 we didn't know how many people were out.

8           That seems a gap between highly intelligent,  
9 capable people and this vast cloud of unknowing, this  
10 vast bit of lack of knowledge, because it seems that--I  
11 won't get into the issue about communications and  
12 relying on customers to tell you who's out, but if you  
13 have 22 feeders and ten have failed and this accounts  
14 for 100,000 customers, to think that almost half of your  
15 feeders are gone and only 1600 customers went out, seems  
16 like there could have been some simple common sense  
17 extension from your activity into this is unprecedented  
18 event, maybe there are unprecedented consequences and  
19 maybe there is an unprecedented number of people  
20 affected, and we need to take unprecedented steps to  
21 investigate.

22           So, to, on the one hand, be very busy attending  
23 to the repairs and, well, no one's called us so it can't  
24 be that bad, we in the community are experiencing as not

1 an acceptable level of explanation. For us this is  
2 unacceptable. And to hear you state to me now I was not  
3 even counted because my meter was still running and I  
4 had a brown light bulb, that makes these numbers totally  
5 inadequate.

6 So, I am feeling terribly disappointed, and that  
7 my needs are not really valued because at low voltage  
8 you can't run your air conditioning. It's like leaving  
9 a dog parked in the car on a day with your windows up.  
10 You know the dog is going to roast really fast. And I  
11 am not even one of your 25,000 customers. I don't count  
12 at all in your thinking patterns in this planning.

13 So, I would like to hear of plans. Do you have  
14 plans for higher level, more rapid, more dramatic  
15 responses when you get to something like ten, ten  
16 contingencies?

17 A. (Miksad) Yes. I just want to clarify the 13  
18 feeders for you first so you understood that. We showed  
19 that the maximum number of feeders out at any one time,  
20 and that occurred--actually occurred twice, on Tuesday  
21 evening and Wednesday morning was ten. What we say in  
22 the report about 13 was that 13 of the 22 feeders were  
23 the ones that caused all of this trouble.

24 What we are saying is nine feeders in the network

1 never failed. They hung in there for the entire  
2 duration of the event.

3 Q. But you had ten simultaneously?

4 A. (Miksad) Ten simultaneously at two times. That's  
5 the first. The second is I hear your concern and I  
6 heard you say you heard a disparity between Con Edison  
7 has control of the situation and this obvious lack of  
8 understanding with regard to customer count.

9 That's absolutely true. I thought that's what we  
10 had said in that, on the one hand, the operators really  
11 worked very hard in order to maintain the rest of the  
12 network in order to stabilize it and keep it in service.  
13 They were very focused on that task, I assure you. A  
14 lot of people worked very hard to accomplish that, but  
15 it's very obvious we did not have a handle of the  
16 customer count.

17 I mean 1600 on Thursday versus doing a survey  
18 Thursday evening and coming up with 25,000, obviously we  
19 need to do something better. We have interim steps we  
20 have already implemented, some additional things. We  
21 talked about including systems that will help operators  
22 visualize these sorts of things and bring multiple  
23 system information together for them so they can see  
24 feeder stats, transformer stats, manhole event stats,

1 superimposed on customer reports of outages and low  
2 volts, so that's all going to happen short term.

3 And then ultimately we are going to, as we talked  
4 about earlier with staff, what we are going to study is  
5 the use of additional metering, this what we call  
6 metering or advanced metering, which would be every  
7 customer's meter sending a signal to Con Edison saying I  
8 am in service, I am out of service, and that would be no  
9 more algorithms, no more operator estimates, no more  
10 system estimates. This would be factual data sent to an  
11 operator to alert us of outages.

12 Now, that is not without challenges, and Mike had  
13 alluded to that earlier that not been done in a network  
14 system. Completely underground meters all in basements  
15 and communicating signals from below the ground up to  
16 some remote point is a challenge.

17 Just think about cell phone service when you are  
18 in some of these places. We have got technical issues  
19 to overcome. There is a cost issue. I mean, again, I  
20 don't remember the actual numbers, but for the five  
21 million meters I believe that Southern California Edison  
22 is planning on installing, I seem to recall the number  
23 is about two billion, \$2 billion, to do that in that  
24 program.

1           That is something that in my opinion we should be  
2 talking about collectively to see if the cost is--to  
3 look at the cost and benefits of that kind of system and  
4 those kind of dollars, but it is something that we first  
5 have to prove is technically feasible for our system.

6           JUDGE STEIN: You have another few minutes.

7           Q.       Given that the system you just described, the  
8 response system and assessment system, very technology  
9 based, it seems easily available and affordable to  
10 immediately dispatch some guys in a truck or a truck to  
11 the field. The decision not to employ that simple tool  
12 earlier on seems management failure, from our  
13 perspective.

14           The simple, very cost effective, say some guy was  
15 driving and noticed, hey, seems to be more. Given that  
16 low voltage, people aren't even--couldn't that immediate  
17 field assessment be required to have a real live, real  
18 time handle on the situation?

19           Because we suffered in real time. If you were in  
20 my house those first two nights, Wednesday and Thursday  
21 or Tuesday and Wednesday, we heard nothing but sirens  
22 all night, ambulance and fire engines. While you are  
23 tabulating, we are having medical emergencies. We are  
24 having crisis.

1           So, this is the gap I am speaking of and this is  
2 not a technology gap. This sounds very '70s. This is a  
3 sensitivity gap between your services that affect  
4 living, breathing human beings and your work. You need  
5 to--we need to communicate to you that those needs have  
6 to be included in your decision making from the  
7 beginning. And level ten contingency seems to  
8 automatically imply potentially high human consequences.

9           And this is what we are disappointed with from  
10 the outage, and we appeal to you to immediately  
11 implement on any level anywhere in the city or anywhere  
12 in your jurisdiction because this was not acceptable.  
13 This can't be collateral damage. You know? So, that's  
14 the end of my questions for now.

15       A.       (Mucci) It's not acceptable to us either that we  
16 had that many customers out, and it's not our usual  
17 performance. As engineers who pride--before this--pride  
18 themselves on performance, it's a disappointment to us  
19 too that this happened.

20           We have got a good number of corrective actions  
21 that I think are going to prevent this, reduce the  
22 probability of this happening again.

23           JUDGE STEIN: Let's take a five-minute break.

24           (Recess taken.)

1           JUDGE STEIN: We are going to hear from the  
2 Attorney General and then the Consumer Protection Board.

3 EXAMINATION BY MS. BURNS:

4 Q.       Mary Ellen Burns from the Attorney General's  
5 Office. Good afternoon. I just have a couple of  
6 questions and then Charlie Donaldson from the office  
7 will also have a couple of questions.

8           My first question is: Before 2006 what was the  
9 highest number of primary feeder cables that were ever  
10 out at the same time in the Long Island City network?

11 A.       (Mucci) We know in 1999 we had seven, and before  
12 that we go back quite a number of years. I am not sure  
13 when the previous record was before. That seven was in  
14 1999. I remember that.

15 Q.       That was during the same time as the Washington  
16 Heights blackout?

17 A.       (Mucci) Within a day. I think it was July 5th,  
18 if I remember right.

19 Q.       If you know, has any other network in the Con Ed  
20 system ever gone to a tenth contingency during the  
21 summer cooling season?

22 A.       (Miksad) I don't know. It would also be relative  
23 to the normal number of feeders that normally supply the  
24 network. Battery Park City, for example, only has eight

1 feeders. So, but I don't know off the top of my head.

2 Q. Would it be fair to say a tenth contingency was a  
3 fairly unusual event?

4 A. (Mucci) Extraordinary events.

5 Q. Do you have any thoughts or any analysis done on  
6 Con Ed why the network went so quickly on the evening  
7 from Tuesday the 18th from a sixth to I believe a tenth  
8 contingency, I believe by your report, within the space  
9 of a half hour in that evening went from six to ten?

10 A. (Mucci) We do know a couple of things. We do  
11 know when you have feeders out and you reach--as the  
12 number of feeders out in a network increases the  
13 probability that the next feeder will fail increases.

14 We also know that the probability of the feeders  
15 will fail increases with temperature, outside  
16 temperature. We also know that probability of feeders  
17 will fail increases with pick up of load. And all of  
18 these were factors in what we think of as a cascade.

19 But the primary driver was that the--we got--we  
20 found ourselves in a recursive cycle after we had three  
21 events that in their confluence was extremely improbable  
22 to happen.

23 The three events did happen, happened in the same  
24 network, and put us in a situation where the energy in

1 the primary system was actually being transmitted into  
2 the secondary. In other words, secondary flows  
3 increased to a point we know there was going to be some  
4 secondary heating and that heating caused cables,  
5 secondary cables, to damage primary cables with heat and  
6 fire, and transformers to fail because the load of the  
7 transformers went up.

8 And the other thing is these feeders were in the  
9 same general residential areas and in the fringe of the  
10 network which added to the whole situation. If you are  
11 in the side of the network, the fringe of the network  
12 energy is to flow--only can supply from one direction  
13 and not from two.

14 If it had been in the center of the network--all  
15 of those were factors in the fast driving, fast acting  
16 event. It was an extreme challenge for us and because  
17 in that event we had only minutes to do significant  
18 amount of analysis and try to understand what was  
19 happening and try to predict where we would be.

20 Q. During that evening when you reached the tenth  
21 contingency or before, are there documents that reflect  
22 the decision making that went on that you discussed  
23 earlier today in your presentation about the factors  
24 that go into or went into making decisions about whether

1 or not to shut down the network at that point?

2 Do you have documents that reflect that decision  
3 making?

4 A. (Miksad) I think there is a record of status  
5 points that we talked about. In other words, there is a  
6 record of what the feeder loading was at that time and  
7 what the transformer loading was at that time and the  
8 indication of secondary damage.

9 But if you are saying more than that, like some  
10 minutes after that a meeting occurred to discuss the  
11 issue and express opinions and that sort of thing, that  
12 didn't occur. There were numerous--and this was not  
13 just--I should say this was not a decision. This was  
14 not two decisions on Tuesday evening and Wednesday  
15 morning.

16 This was a series of evaluations that were  
17 occurring during this entire period and judgments being  
18 made to say can we continue in this way or do we need to  
19 shut down.

20 So, and that was occurring through multiple  
21 discussions between distribution command post, the  
22 Brooklyn-Queens control center, and our emergency  
23 control center. Sort of a three-way discussion.

24 Q. In the situation as it occurred during the Long

1 Island City outages, who was the person or persons who  
2 make that ultimate decision?

3 A. (Miksad) By procedure, the decision is left to  
4 the regional vice president in charge of that area or  
5 his or her delegate, which generally means the general  
6 manager of the area.

7 I should say, though, that we have operators on  
8 duty around the clock, you know, 24/7, that if some  
9 quickly developing situation arose at midnight on  
10 Saturday they are empowered to also make that decision  
11 if they had to.

12 Q. And then finally on my end, we have heard some  
13 discussion and questioning about the large users and  
14 particular the large transport users, the Transit  
15 Authority, the Long Island City Railroad, and so forth.

16 I want to probe again. On Tuesday or at any  
17 point were you in conversations with each or all of  
18 those entities? And what was the nature of the  
19 discussions in terms of their needs for power and their  
20 concerns, if any, about Con Ed shutting down the  
21 network? And to what degree did their requests, if any,  
22 that you not do that or other concerns that they might  
23 have affect your decision making about shutting down the  
24 network?

1 A. (Miksad) There were discussions with--and there  
2 is good documentation I think also in the report about  
3 communication that was going on between major customers,  
4 both transportation and others.

5 Q. It mentions communications but it doesn't give  
6 the flavor.

7 A. (Miksad) That's where I was going. Obviously  
8 two-way communications. A lot of it was Con Edison  
9 folks requesting load reduction obviously from various  
10 parties. And you heard about La Guardia airport and  
11 Rikers, essentially asking Rikers to go on generation to  
12 deload the network.

13 A conversation with Citicorp building to put on  
14 their generation and reduce load. You heard about the  
15 Bowery Bay pollution treatment plant also. There were  
16 discussions going on throughout this event to obtain  
17 load reduction and to communicate to customers that we  
18 have--large customers, that we have a problem.

19 Q. What about specifically with the Transit  
20 Authority, Long Island Railroad, and anybody else at the  
21 MTA?

22 A. (Miksad) There were a number of discussions. I  
23 can't say I could find out there were discussions about,  
24 hey, listen, this network has a potential for shutting

1 down, but I do know that prior to that the TA did  
2 provide an assist in reducing load.

3 So, I know there were discussions about trouble  
4 in the network and about load reduction requests as a  
5 result of that trouble. And they did help us out quite  
6 a bit.

7 (Mucci) I could say I was part of some of the  
8 discussions that we had and almost in all cases people  
9 were asking how they could help out. The Transit  
10 actually reduced the speed of the trains and the number  
11 of trains. And unfortunately I guess that hurts the  
12 public pretty much, but the point was they were trying  
13 to help us in any way they can.

14 People who had generators when we asked them they  
15 went on generators, no question about that. Rikers  
16 started generators. Citibank sent people home, closed  
17 the building. We had a good number of industrial  
18 commercial customers that gave significant amount of  
19 response.

20 Actually when we measured it later on, on appeals  
21 alone we got 70 megawatts from commercial programs not--  
22 without the programs. With the programs on we were over  
23 90 megawatts reduction.

24 Q. So, no one at Con Ed got any requests or appeals

1 from the Transit Authority or the MTA, its parent  
2 company, or from the city, that they not shut down the  
3 network because of the impact it would have on the  
4 Transit system?

5 A. (Mucci) Not that I am aware of. Joe Murphy could  
6 probably comment on more direct conversations because he  
7 was in touch minute by minute with these people.

8 MS. BURNS: I am actually trying to focus on the  
9 ground transportation system.

10 MR. MURPHY: Those contacts were handled through  
11 the central command post through our OEM contact. I was  
12 not privy to those dialogs with MTA.

13 Q. Who would have had the conversation?

14 A. (Miksad) Would have been emergency management  
15 vice president or someone from his group, essentially  
16 our liaison to OEM.

17 Q. So, conversations would not be had directly with  
18 the Transit Authority or the MTA but through OEM; is  
19 that what you are saying?

20 A. (Miksad) I think that's--if Joe did not have  
21 direct conversation with Transit Authority.

22 MR. MURPHY: There may have been some interim  
23 phone calls to let them know what was going on, but with  
24 respect to the specific initiatives that the Transit

1 Authority took I believe Wednesday, frankly supporting  
2 our request, I believe that dialog was had specifically  
3 through central command post with our office of  
4 emergency management.

5 (Miksad) One other thing that I am thinking  
6 about, actually two other things that occurred. I  
7 mentioned earlier that Con Edison sends representatives  
8 to the office of emergency management command post.  
9 Transit is also in that location, so there is dialogue  
10 going on also within that as well as Con Ed to Transit  
11 as well as OEM sponsored conference calls.

12 They have updated conference calls. Every two or  
13 four hours they discuss latest stats and each agency  
14 briefs the central command on stats and issues.

15 MS. BURNS: I don't have anything further but I  
16 think Charlie Donaldson does.

17 MR. DONALDSON: Try to keep this as brief as  
18 possible.

19 EXAMINATION BY MR. DONALDSON:

20 Q. During the power point reference was made to if a  
21 feeder goes down it puts stress on a "related" feeder.  
22 In that sentence what does the word "related" mean?

23 A. (Mucci) When a feeder comes off the load, that  
24 feeder carries--is now carried by another feeder, and

1 it's--the largest portion of that load is carried by the  
2 feeder that's closest in electrical proximity to we call  
3 it companion feeders or feeders near it.

4 So the feeders that run in the same sort of  
5 pathway will pick up more load than feeders further out.  
6 And it's more serious for those feeders suddenly picking  
7 up more load.

8 (Miksad) As an example, with 22 feeders in the  
9 network, if you lose one, all 21 feeders could pick up  
10 some percentage of that lost supply capability but it  
11 would not be equally distributed. Feeders in closest  
12 electrical proximity to the feeder that is out of  
13 service will pick up the lion's share of that loss  
14 capacity.

15 Q. Related meant the same thing as electrical  
16 proximity?

17 A. (Miksad) Yes.

18 Q. You folks in the study had a dialogue about four  
19 cut in open autos that are described on page 413 of the  
20 October 12th report, and as written--as referenced to  
21 things like cable joint failures and the company's  
22 explanation is they were caused by hi-pots or something  
23 trying to figure out what the problem was, but it's  
24 really inrush that knocked them out. The studies that

1 say this is really caused by inrush, when were those  
2 finished?

3 A. (Mucci) We are actually still studying the  
4 problem, but made our conclusions probably about mid  
5 September.

6 Q. That's before the report?

7 A. (Mucci) Oh, yes.

8 Q. One last thing. There was conversation earlier  
9 on the question of what counts as a "customer out of  
10 service". You made reference to putting in some new  
11 meters that will tell you whether the customer is out or  
12 not.

13 Let's say for sake of argument that the  
14 customer's got low voltage, you got a brown out. Is the  
15 meter going to pick the condition up or not?

16 A. (Miksad) I am not sure of the answer, but given  
17 the fact that I said that the way I believe they operate  
18 is that even on the loss of power they have enough  
19 either battery back up or capacity to--back up to send  
20 out a signal, I would say it would also give it the  
21 ability to do so as low voltage situation.

22 Q. I was looking at it from the customer's side. Is  
23 it going to tell you the customer's got low voltage on  
24 the other side of the meter?

1 A. (Miksad) I don't know. We would like to have  
2 that.

3 Q. One final thing. You have got a customer who has  
4 lost a phase, got baseboard power in one room and lights  
5 in the next, but not all power everywhere. Are the  
6 meters going to pick that condition up?

7 A. (Miksad) Again, it would be a function we would  
8 like to have. Would have to check on whether it  
9 actually delivers that.

10 MR. DONALDSON: That's all I have.

11 JUDGE STEIN: Consumer Protection Board.

12 MR. WALTERS: Yes. I just have a few questions.  
13 A lot of the stuff we were going to ask has already been  
14 covered.

15 EXAMINATION BY MR. WALTERS:

16 Q. I wanted to go back to the AG's questioning. I  
17 think you, Mr. Miksad, referenced the individuals that  
18 have the ability or the authority to shut down a network  
19 system. And you said I think the regional vice  
20 president or one of the managers.

21 I just received this recently, network shut down  
22 procedure system operation manual, and it might be in  
23 here, might not be, I honestly don't know. Is there  
24 anywhere that parties could look to find a definitive

1 process by which the decisions are made? Is there any  
2 place that's spelled out?

3 A. (Miksad) Yes, it is.

4 Q. Where would that be?

5 A. (Miksad) It's specification EO-4095.

6 Q. We have that?

7 A. (Miksad) I believe so.

8 Q. You mentioned also, Mr. Miksad, you mentioned  
9 earlier a number of times the five factors that the  
10 company uses in evaluating the system when making a  
11 determination whether to shut down the system.

12 In this instance, July 17th, Long Island City,  
13 were there any--did any of those factors bear any more  
14 weight than the others or were they all considered  
15 equal? Is there one factor you would look at or are  
16 they ranked in any order or how does that work?

17 A. (Miksad) I am just thinking about one factor that  
18 stands out above the others. I don't think one stands  
19 out. Any of them in a large degree could result in very  
20 long term troubles for the network.

21 Like I was saying earlier, when you burn up--  
22 extensively burn up any of those systems, you are  
23 talking about very long outages. Now, we consider this  
24 eight-day, seven-day outage a very long outage, but what

1 could happen in this worst case scenario would be  
2 significantly worse.

3 Q. Going back, again, I am not--it was mentioned a  
4 number of times, but you mentioned Thursday the company  
5 went out and did basically a head count, for lack of a  
6 better word.

7 Has the company ever done that in the past for  
8 any outage, or is that unprecedented as far as outages  
9 are concerned, for the company?

10 A. (Mucci) Everybody has said it's unprecedented.  
11 My 38 years, I don't remember that happening.

12 (Miksad) Just so you know, I referred to the one  
13 chart that showed four outages with over 1000 customers  
14 out in 40 years in a network that's still in service.  
15 So, that is sort of the indication of how it could be  
16 unprecedented. This sort of thing does not happen and  
17 this outage far exceeded any of those historical  
18 outages.

19 Q. I guess I am trying to--over 1000, the company  
20 has never gotten to that level?

21 A. (Miksad) Never, no.

22 Q. I believe it was the city that had asked you some  
23 questions on the RMS and you mentioned, and I am  
24 blanking, I think it was Hazeltine was the original

1 supplier?

2 A. (Miksad) That is correct.

3 Q. And you mentioned British?

4 A. Aerospace Engineering, BAE.

5 Q. The design for the system when you were being  
6 supplied I guess by Hazeltine was 95 percent, or that's  
7 the ultimate design or preferred design, the 95 percent  
8 number?

9 A. (Miksad) I believe that target was created after  
10 Washington Heights in '99. I don't think that was  
11 established prior to that. When the system first came  
12 into effect, as I said in the early '80s, and took us  
13 ten years to install on the entire system 25,000  
14 transformers.

15 So, until the late '80s, early '90s, the system  
16 wasn't fully implemented on our network system.

17 Q. For explanation purposes, for a lay person like  
18 myself, the 80 percent number that was quoted, that was  
19 where the system was during the event or in the days  
20 leading up to the event?

21 A. (Mucci) It was 79 I think point something.

22 Q. So, give or take. Is that an acceptable number  
23 for Con Ed?

24 A. (Desanti) Can I just have a clear picture of

1 these numbers? The RMS operating at 80 percent,  
2 operating at 80 percent allows you to look at eight out  
3 of ten transformers in the network and 95 you look at  
4 nine. And for operators, we think that's a useful  
5 number.

6 And also you have to remember these networks  
7 operated for grids, we had this system and able to  
8 operate them effectively.

9 Q. So the 80 percent number would be general  
10 industry practices? I know there is not a lot of these  
11 type of systems.

12 A. (Desanti) You can operate the network at  
13 80 percent.

14 Q. Can you give attribution to lack of the supplier  
15 leaving from going from the 95 number to the 80 number?  
16 Would you agree that was the only factor involved?

17 A. (DeSanti) I wouldn't say it was the only factor.  
18 Certainly one of many factors in the 80 percent.

19 Q. What other factors in the number would be reduced  
20 by that amount?

21 A. (DeSanti) Other factors would be there was patent  
22 rights associated with this. Couldn't bring in other  
23 vendors. Recently we went to a new generation of the  
24 receivers we are starting to install to hopefully

1 improve the rate. We installed one now at the  
2 substation in north Queens on this network. That should  
3 help.

4 Q. Are you talking about the interlude between  
5 Hazeltine and the British company?

6 A. (Desanti) You mentioned patents, yes, I believe  
7 so.

8 (Miksd) Actually, the patents actually expired  
9 after the acquisition. The patents only expired I am  
10 thinking two or three years ago to give others access  
11 to.

12 Q. What time period are we talking about here I  
13 guess for the transition between Hazeltine and British?  
14 Was there a notice given to you guys or they pulled up  
15 stake and they left?

16 I am confused what time period we are talking  
17 about and when this transition was made and how that  
18 went about.

19 JUDGE STEIN: You have been very patient. I  
20 wonder if we would get a more productive response out of  
21 an IR at this level of detail, a written answer, people  
22 could go back to the documentation.

23 MR. WALTERS: That's fine. We were on that line.  
24 The city started it.

1 JUDGE STEIN: I would like to see the answer.  
2 It's hard to get it.

3 MR. WALTERS: No further questions.

4 JUDGE STEIN: Thank you very much.

5 MR. AUSTRIA: Ric Austria from Pterra.

6 EXAMINATION BY MR. AUSTRIA:

7 Q. Earlier in the question and answer period you  
8 talked about the probability of failure of the feeder  
9 increase with temperature and with load. With respect  
10 to increasing load, do you mean current increasing so  
11 that if you have some other factor that increases the  
12 current you're probably looking for failure of the  
13 feeder in certain cases?

14 A. (Mucci) We are talking about increases in current  
15 and increases in heat. You got concomitant heat with  
16 the current.

17 Q. So, increases in current that result in increases  
18 in heat, so if you have, say, low voltage resulting in  
19 high currents that result in heat, you have the same  
20 somewhat impact on probability of outage?

21 A. (Miksad) Are you tying this into the voltage  
22 reduction? Is that your point?

23 Q. No. I am coming from a system voltage point of  
24 view and trying to understand the probability of the

1 feeder outages in relation to certain factors.

2 And I think you discussed temperature with your  
3 Honor and you mentioned increasing load and I am trying  
4 to clarify whether increasing load means increasing  
5 current.

6 A. (Mucci) Yes. Increasing load means increasing  
7 current, but voltage is regulated by the tap changes in  
8 the substation, so voltage would remain where it's set  
9 at. So, you wouldn't decrease voltage to increase  
10 current. Tap changers would change to supply it.  
11 Remember that the substation can supply more than the  
12 network can use, essentially.

13 Q. I was leading to that. If you get to a point  
14 where your tap changers are under limits due to the  
15 increasing demands of the load, your voltage will move  
16 down on the low voltage side and your currents will  
17 rise.

18 JUDGE STEIN: Is that a question?

19 A. (Mucci) That's almost impossible because the tap  
20 changers--first of all, we designed the station in this  
21 particular case to exceed the capacity of the network.  
22 And second, the tap changers will remain--will regulate  
23 the voltage in the network and will move up and down to  
24 regulate that.

1           A situation with the tap changer is all the way  
2 up and voltage remains--continues to go low would be  
3 something--that would be a stream that we have not  
4 experienced. In this particular event this station had  
5 more capacity than the network could use, so it's  
6 unlikely you ever get to that very improbable.

7           Q.       In terms of capacity, are you referring to  
8 reactive capacity or tap changing capacity?

9           A.       (Mucci) I am referring to the capacity of the  
10 demand of the network. Capacity of the transformers in  
11 the substation are greater than the demand in the  
12 network.

13           (Miksad) We do both actually. We look at both  
14 megawatts capability of the station and we design the  
15 station to supply the forecasted demand for the  
16 following summer. And I mentioned earlier about the  
17 ten-year forecast looking at and making sure we do  
18 reinforcements to the substation prior to any need.

19           Whenever we forecast the load or demand  
20 capability, we are taking steps or measures to either  
21 reduce the load off that station or increase the  
22 capability of that station. We also look at voltage and  
23 make sure voltage will operate within design criteria  
24 within the contingency level.

1           So, John mentioned we have a number of our  
2 sources, obviously, from the--we have capacity to bank  
3 VAR support to the network. So, we are monitoring,  
4 measuring and supporting the system for both megawatts  
5 and megaVAR requirement.

6           Q.       Maybe we can get back to this point because we  
7 are answering a slightly different question. Maybe we  
8 can approach it in two or three questions.

9           It was a hot summer day, July 17th. The  
10 presumption was there was large amounts of air  
11 conditioning load. Could you estimate how much of that  
12 load at that time was air conditioning load?

13          A.       (Miksad) I am sure someone in Con Edison could.  
14 I don't know if we can, but someone could tell us what  
15 they estimate the air conditioning component of the load  
16 to be. I am not sure to what degree of accuracy, but it  
17 could be estimated.

18          Q.       Was there then a measure of the reactive demand  
19 into the Long Island City load pocket?

20          A.       (Miksad) Yes.

21          Q.       Before and during the events?

22          A.       (Miksad) Yes.

23          Q.       Were they within power factor targets for that  
24 load pocket or experience VAR factor levels?

1 A. (Miksad) I guess the actual answer is I don't  
2 know for sure, but what I do know is that the voltage at  
3 the station was controlled by--under control of the  
4 operators, and the only impact to the voltage was what  
5 we actually initiated, which was the voltage reduction  
6 we referred to which occurred--was triggered on Monday  
7 evening, which there was deliberate attempt to reduce  
8 the demand of the network, but that was under the  
9 control of the operators and it was not as a result of  
10 some lack of VAR support.

11 Q. We discussed the voltage reduction. I did have a  
12 follow up question. Could you clarify when you said an  
13 eight percent voltage reduction was significant for the  
14 27 kv voltage to go down by eight percent?

15 A. (Miksad) Yes.

16 Q. And taps are allowed to change on the step down  
17 to the secondary, or is this taps from the high side,  
18 138 kv?

19 A. (Miksad) These are taps on the 27 kv side on the  
20 power transformers in the substations.

21 Q. On Monday, July 17th, even before the first  
22 feeder outage, there were reports of low voltage. This  
23 was stated in the report. To what extent was the low  
24 voltage--and this related primarily to secondary, to the

1 secondary network?

2 A. (Ketschke) Yes. We did--I forget the exact  
3 number. There were a small number of low voltage  
4 complaints in the network prior to any of the feeder  
5 outages. Those were related to secondary issues,  
6 isolated to the individual customers.

7 It's not uncommon if people add air conditioning  
8 load it doesn't--we don't see the low voltage problems  
9 until the summer because they essentially oversize the  
10 load without filing with us.

11 The first hot summer day throughout the system  
12 it's not uncommon to see low voltage complaints as  
13 people added demand without filing for an upgrade.

14 Q. Did you--you steadily monitor the voltage to  
15 maintain that voltage and customer would report a low  
16 voltage because the experience at the secondary side is  
17 telling them there is a low voltage. Did they tell you  
18 what the low voltage is on the secondary side?

19 A. (Ketschke) Depends on the source of the call from  
20 the customer. If it's an individual homeowner sometimes  
21 they are savvy enough to be able to report actual  
22 voltage readings. Sometimes they only will report they  
23 have indications of low voltage, like dim lights, or if  
24 it comes sometimes from electricians or if it's a larger

1 building.

2 But these are not--when we go out we will check  
3 two points to see if in the street we have low voltage  
4 in the area, which is most commonly related to if there  
5 is an issue within the secondary system.

6 The more common cases are it's an issue with  
7 either the service cable going to the customer or  
8 customer has added load beyond the capability of their  
9 service point.

10 Q. If there is a low voltage in a meshed network  
11 then it tends to be spread out rather than in a radial  
12 supply you have low voltage at the end of it, does it  
13 spread out where if you start an air conditioner several  
14 customers already see the low voltage?

15 A. (Ketschke) Not typically. If you recall some of  
16 the slides, the network system is an intermeshed system,  
17 not a radial with each individual load along the system  
18 would be drawn down. Unless you have an unusual  
19 configuration or some other defect in the system you  
20 don't typically have an impact of one customer's load on  
21 a neighboring customer unless it's a significantly  
22 oversized load.

23 The system hasn't been adjusted to compensate for  
24 most commonly when customers add load and don't tell us

1 or cable was to fail and we didn't know about it.

2 Q. If a customer did report a low voltage then the  
3 likelihood that neighboring customers are also  
4 experiencing the low voltage because of the nature of  
5 the network?

6 A. (Ketschke) Not necessarily. That does happen in  
7 some cases. That's usually because a component, usually  
8 a cable section of the underground distribution system,  
9 has failed, moving those customers from two directions,  
10 supply to radial supply. More commonly it's a low  
11 voltage at a single customer.

12 Within the network we do have a monitoring point,  
13 a voltage monitoring point, that monitors the voltage  
14 for the whole network at the distributed network level  
15 to kind of give a snapshot view of the distributed  
16 network.

17 Q. Sorry to belabor this. Just clarifying where the  
18 low voltage reports are coming from. There was no  
19 outage on the feeders yet at this point but there are  
20 outages on the secondary that would have resulted in the  
21 low voltage reports?

22 A. (Ketschke) There were--I don't recall the exact  
23 numbers at the start of this event. It was a small or  
24 no individual customer outages. There was a small

1 number of low voltage complaints and those were  
2 attributed, as far as I know, I haven't gone back and  
3 read every one of them in detail, those were attributed  
4 to issues directly related to customer service or  
5 secondary cables immediately adjacent to customer  
6 service. Things like secondary connection, poor  
7 connection, not to inadequate voltage support or VAR  
8 support coming from the area substation.

9 Q. If there are indications of low voltage would you  
10 attribute these to a need for reactive support, large  
11 reactive demands, like air conditioners turning on and  
12 any other factors you might from experience be familiar  
13 with?

14 A. (Ketschke) My experience has been the majority of  
15 low voltage in the distributed network are related to  
16 undersized capacity size within the network, not to the  
17 components of the load. The power factors are managed  
18 fairly clearly from the area substation by switching  
19 capacitor banks out of service at the area substation.

20 So the majority--in the time I have done work  
21 with network system, the majority of low voltage  
22 complaints are trying to preserve it.

23 Q. Another way, since we were talking about that,  
24 maybe this is where we approach the same point we were

1 talking about. In beginning you have low voltage  
2 because you have large demand?

3 A. (Ketschke) When we have low voltage complaints  
4 mostly they are associated with the distribution  
5 systems, to that customer being undersized for some  
6 reason. And most common reason that has occurred, in my  
7 experience, the customer added demand without telling  
8 us. They are underground infrastructure or building a  
9 structure and the wire is not big enough when they added  
10 additional load.

11 Q. If the current goes high is that a reason why the  
12 voltage will be recorded low on the feeder?

13 A. (Ketschke) Not on the feeder, on the individual  
14 service or secondary system. The voltage issues for low  
15 voltage beyond the times when we initiate voltage  
16 reduction for system reasons, in my experience I have  
17 not seen voltage complaints that come from issues  
18 related to the substation or VAR feeder or VAR feeders.

19 Q. We are talking about secondary low voltage and  
20 increasing demand, so increasing current going with  
21 that.

22 A. (Ketschke) Increasing current with increasing  
23 demand, particularly when the system has not been  
24 reinforced to accept that demand. Most commonly

1 occurring when people add load and don't tell us. In  
2 general, when they add load and tell us we will design  
3 the system to support both voltage and current needs.

4 Q. Mention earlier that you do derive VARS from the  
5 transmission system into, for example, the Long Island  
6 load pocket. Specifically to Long Island, how did the  
7 VARS come into the load pocket? What path do they  
8 normally take?

9 A. (Miksad) They come in--we are talking about the  
10 north Queens substation which is attached to the Astoria  
11 east transmission station, so they will come in from  
12 Astoria east, Con Edison's Astoria east substation, to  
13 north Queens. By the way, those substations are located  
14 on the same piece of property.

15 Q. At Astoria, is VARS coming into Astoria as well  
16 that gets shipped into Long Island, VARS from the higher  
17 voltage network?

18 A. (Miksad) VARS don't travel well over long  
19 distances, so the vast majority of the VAR support  
20 occurs fairly locally on the transmission system. As I  
21 said earlier, we have also VAR sources within the  
22 station, namely either 20 or 30 megaVAR capacitors, and  
23 generally each station has either two or three sets of  
24 capacitor banks to provide the VAR support necessary.

1           (Mucci) Also six major power plants in the same  
2 property. Plus I think about 700 or 800 megawatts of  
3 gas turbines. We don't own those machines. They are  
4 owned by independents.

5           (Miksad) Point being, those are all sources of  
6 VARS that are available locally for north Queens and  
7 Long Island City.

8           Q.       And do we know that those power plants at  
9 Astoria, the units in Astoria, were available during  
10 this week?

11          A.       (Miksad) I don't know the specific stats of all  
12 the units that John just outlined, but I do know on a  
13 week like this all would be called for to be in  
14 operation by the New York ISO.

15          JUDGE STEIN: Let me interject for a minute. We  
16 only have ten minutes until we have to make the phone  
17 call. I do want to give you a quick break.

18          MR. NORLANDER: I am yielding my time.

19          JUDGE STEIN: We only have five minutes because  
20 the stenographer needs a break and we have to make the  
21 call.

22          MR. AUSTRIA: I think there is just a couple of  
23 questions.

24          JUDGE STEIN: Thank you.

1 BY MR. AUSTRIA:

2 Q. If the only source--there is a megaVAR source in  
3 Astoria that supplies the Queens load pockets, is there  
4 absolutely no megaVAR that comes there or you lose  
5 megaVARS going to the step down transfer, but there is  
6 megaVARS on the 345 kv that may go through, are they  
7 controlled in any way into the load pocket?

8 A. (Miksad) Into that load pocket, no.

9 Q. So, megaVARS can flow from the 345 kv, I guess  
10 the closest would be the Sprain Brook and Rainey  
11 substations?

12 A. (Miksad) That's not a direct path to Astoria  
13 east, but megaVARS can flow from the 345 into the 138 kv  
14 system, yes.

15 MR. AUSTRIA: I have no more questions. Thank  
16 you very much.

17 MR. NORLANDER: One question.

18 EXAMINATION BY MR. NORLANDER:

19 Q. We just mentioned the New York ISO and our  
20 discovery has shown that you asked the New York ISO to  
21 implement a load reduction program on the morning of  
22 Tuesday, but Con Edison had lowered the voltage on  
23 Monday night.

24 I was just curious if you could elaborate on your

1 communications with the ISO and the reasons why you went  
2 to voltage reduction first before load shedding, when I  
3 would think that--or load reduction--when I would think  
4 that from an electrical risk point of view it would be  
5 less risky for a customer to get off the system than to  
6 reduce voltage.

7 A. (Miksad) Understood. The sole reason for that is  
8 voltage reduction is something that generally is  
9 immediate, has an immediate effect. I talked earlier in  
10 response to one of Mike's questions that it generally  
11 takes minutes to see the effect of voltage reduction, so  
12 back ups went into that fifth contingency, the higher  
13 level contingency, to look for something immediately to  
14 reduce the demand on the grid in order to reduce the  
15 stress on the remaining in service components.

16 That's why we chose to implement voltage  
17 reduction. Generally, the demand reduction programs  
18 take time to implement. In many cases some of those  
19 programs actually require a day ahead notification to  
20 customers and operators and we felt we didn't have the  
21 time for that.

22 JUDGE STEIN: Thank you. That concludes our  
23 questioning and our discussion of this morning's panel.  
24 Didn't quite finish it by two. So, we can go off the

1 record.

2 (Recess taken.)

3 JUDGE STEIN: Let me begin. Would you like to  
4 introduce yourself.

5 MR. COLONNA: My name is Nick Colonna, I am  
6 director of planning and analysis for Con Edison,  
7 responsible for the operating and maintenance and  
8 capital investment budgets.

9 (Nicholas Colonna duly sworn or affirmed).

10 (Mr. Berklee appearing telephonically.)

11 JUDGE STEIN: Mr. Berklee, would you like to put  
12 in an appearance for the record?

13 MR. BERKLEE: Yes. This is Richard Berklee. I  
14 am appearing for Assemblyman Richard Brodsky, Chairman  
15 of the Assembly Committee on Corporations, Authorities  
16 and Commissions.

17 JUDGE STEIN: Thank you very much. And we have  
18 the other members of the panel here from Con Edison who  
19 may respond to your questions. Maybe they will just  
20 state their names and you can proceed and they could say  
21 who they are as they answer. That might be helpful.

22 MR. BERKLEE: Thank you.

23 MR. MIKSAD: John Miksad, senior vice president  
24 of electric operations for Con Edison.

1 MR. MUCCI: John Mucci, vice president of  
2 planning and engineering for Con Ed.

3 MR. RASMUSSEN: Andrew Rasmussen, vice president  
4 and controller for Con Edison.

5 JUDGE STEIN: Thank you very much. Why don't you  
6 proceed, Mr. Berklee?

7 MR. BERKLEE: Thank you.

8 EXAMINATION BY MR. BERKLEE:

9 Q. The October 12th report states that between 2000  
10 and 2005 Con Edison spent roughly \$800 million on the  
11 Brooklyn-Queens distribution system. And the  
12 Assemblyman wanted to know how much of those capital  
13 expenditures were spent solely on the Long Island City  
14 network.

15 A. (Colonna) As stated in the report, that for the  
16 same period approximately \$50 million was invested in  
17 the Long Island City network.

18 Q. Thank you. How much--over the same time period,  
19 2000-2005, how much O&M money was spent solely on the  
20 Long Island City network?

21 A. (Colonna) During that same period we spent  
22 approximately \$52 million in maintenance in the borough  
23 of Queens. Approximately 21 percent of that \$52 million  
24 is in the Long Island City network.

1 Q. Thank you. How much of the capital expenditure  
2 money spent on the Long Island City network for that  
3 time period are attributable to growth and demand?

4 A. (Colonna) It wasn't categorized that way, but in  
5 the report we talk about the amount of work we did  
6 during that time period to upgrade the primary,  
7 secondary system transformers, replace secondary cable,  
8 primary cable, elimination of what we call the paper and  
9 lead cable and heat sensitive joints.

10 Also, during that time, there was something that  
11 was related to demand growth with new construction,  
12 major new business development, and reconstruction of  
13 public highways and roads in the borough, in the area  
14 where we had to relocate and upgrade our facilities, but  
15 I don't have the exact breakdown of the dollars in those  
16 broad categories.

17 Q. Con Edison's investment in T&D rose roughly 30  
18 percent from 2004 to 2005, and the 2005 number is  
19 roughly double the 2000 number, and roughly triple the  
20 1995 number of investment in T&D.

21 Just starting with the 2004 to 2005, why did Con  
22 Ed's investment in T&D rise so sharply?

23 A. (Miksad) If I had--I will give you just a general  
24 answer. I don't know if anyone on the panel wants to

1 follow up with more specifics, but there are two major  
2 categories for the capital investment increase.

3 One is in the area that you alluded to earlier,  
4 Richard, the demand growth, and in particular the  
5 addition of the construction of substations and the  
6 transmission to support those--transmission feeders to  
7 support those substations, and then the distribution  
8 outlet system for those substations. That is a large  
9 component of that.

10 The other big factor in that '04 to '05  
11 investment level is we initiated a number of  
12 reliability/public safety programs in the wake of the  
13 Jody Lane fatality down on 11th Street where we, for the  
14 first time, initiated a secondary system program to  
15 proactively changeout the network secondary cables,  
16 whereas previously it was essentially a replacement upon  
17 failure mechanism.

18 So, if I had to say in broad categories, it was  
19 the demand growth and the addition of some public  
20 safety/reliability programs. I don't know if anyone has  
21 anything else to add.

22 (Colonna) We give more specific examples of those  
23 broad categories, but those were the two primary  
24 drivers. We started projects related to the new

1 substation that are going into service next summer.

2 And also, as John alluded to, several  
3 reliability/public safety programs replacing the new  
4 style manhole covers, and then as part of our inspection  
5 program replacing the secondary cable where necessary.

6 Q. How much money on an annual basis since 2000 has  
7 Con Ed invested in emergency response preparation?

8 A. (Miksad) I don't have a number, a dollar number,  
9 for that. I could talk about some of the tasks, some of  
10 the activities that occur on an annual basis, but I  
11 can't--I don't have, nor do I think we break down, sort  
12 of the cumulative dollar value of those activities.

13 Q. I would like to hear a description, but if you  
14 could tell me where those numbers would be in your  
15 general report on finances that would be useful, too.

16 A. (Miksad) As I said, I don't think we break them  
17 out that way, if I understand your question correctly.  
18 It's sort of under the hood of other general categories.

19 But in terms of activities, there are a number.  
20 I guess I will start with--are you interested in  
21 particularly for network system events or in general for  
22 overhead system as well as network system?

23 Q. Both.

24 A. (Miksad) I will start with the overhead system

1 and I would start with our storm planning and training.  
2 And we develop a plan each year. We update the plan  
3 every year for storm preparation and planning. And we  
4 actually submit that to Public Service Commission staff  
5 each April 1st that outlines that plan.

6 And that--parts of that plan include individual  
7 training for participants, emergency response  
8 participants, as well as at least one annual drill to  
9 test the plan.

10 This year in particular we have had a number of  
11 actual storms that have drilled our emergency response  
12 folks, so we got a lot of practice this year. And so  
13 that's on the storm side.

14 We have also, over the last year or two, have  
15 started working on a coastal flood preparedness and  
16 plan, namely hurricane. In the wake of Katrina and the  
17 other hurricanes that hit the Gulf Coast, we have  
18 undertaken, as have others, including New York City,  
19 have undertaken developing plans for if a Category 3  
20 hurricane hit our service territory.

21 It would have different effects for different  
22 parts of our service territory. So, there is an  
23 overhead portion of that which is very similar to our  
24 existing storm plan, only a greater magnitude,

1 obviously. And then there is also a coastal flood plan  
2 which is in particular importance to the network system  
3 being an underground system.

4 So, we have the--we are putting the finishing  
5 touches on that plan right now. Actually, there is a  
6 meeting today to disseminate the final version of that.  
7 We have met with the city OEM on that plan and  
8 communicated to them the plan, and a number of the  
9 issues that we face if we were hit with a hurricane of  
10 that magnitude.

11 So, those two plans are in place. The hurricane  
12 plan, as I said, just putting the finishing touches on  
13 that, and we would then look to establish the number of  
14 people required to support that plan, make sure they are  
15 all identified, trained, and drilled. And that will be  
16 our--the next focus once we enter into that next stage.

17 We also have a plan for heat events, heat waves,  
18 like we experienced this week in July, and that again in  
19 August, which trains and drills the operators to make  
20 sure that they are of a level of sufficiency to  
21 understand the information systems and the data that  
22 they provide and the procedures associated with that.

23 We have established, actually, since Washington  
24 Heights event in 1999, goals for feeder restoration

1 time, so that everyone in the organization is focused on  
2 restoring feeders as quickly as possible, as was alluded  
3 to earlier in the day.

4 And we have significantly reduced the feeder  
5 processing time from an average of about 34 hours back  
6 in 1999 down to, as I mentioned, 12 or 13 hours this  
7 past summer, having a significant impact on reliability  
8 and the number of times we get into multiple  
9 contingencies.

10 Those are the three major emergency preparedness  
11 plans that come to mind. I don't know if I am leaving  
12 anything out, but those are the three major ones that  
13 come to mind.

14 Q. How often does Con Edison drill on the emergency  
15 plans?

16 A. (Miksad) At least once a year. We are planning  
17 to drill more often in 2007, which would include testing  
18 parts of the plan as well as the overall plan. That  
19 would include either table top drills or full blown  
20 simulation of storm events.

21 Q. If you can't break out on an annual basis how  
22 much is spent on emergency response preparation, can you  
23 answer whether Con Edison's expenditures on this  
24 category have stayed the same or increased since 2000?

1 A. (Miksad) I would venture to say, and I don't know  
2 this, but I would venture to say that it has increased  
3 as we have added additional aspects to emergency  
4 preparedness, hurricane being the most significant one.  
5 But we also--the one I did leave out, we have also done  
6 extensive work on preparedness for things like Avian  
7 flu.

8 We participate with the city on some of the  
9 drills that they do for biological weapons and for  
10 radioactive weapons, and we actually have a team of  
11 folks who are equipped to be suited up and enter into an  
12 area that might be exposed by either of those two  
13 events.

14 So, I would venture to say we have, over the  
15 course of these five years, we have increased  
16 significantly the amount of storm--of emergency  
17 preparedness we have done.

18 Q. What has Con Edison expended on its call center  
19 annually from 2000 to 2005?

20 A. (Miksad) Have to get back to you on that.

21 JUDGE STEIN: If you would like to put in an  
22 information request we are doing that for follow up.

23 MR. BERKLEE: I will be doing that for some of  
24 these questions.

1           JUDGE STEIN: The people who are here have been  
2 answering a very wide range of questions, but don't  
3 necessarily have all the information at their  
4 fingertips. And after initially trying to figure out a  
5 way to do follow up we decided to just put it over into  
6 the information request realm because so much  
7 information is passing that way.

8           So, the burden is kind of on the questioner here  
9 to--if there is something you want and it's not in the  
10 report and you can't get it today, by all means put in  
11 an IR.

12           MR. BERKLEE: I will be doing that.

13           Following in that vein then, I would like to make  
14 a request here on the record for capital expenditures  
15 and O&M for Con Ed's entire system for 1995 to the  
16 present as a whole, and then broken down separately for  
17 Westchester, and separately for the city borough by  
18 borough or, I'm sorry, the organizational units. And I  
19 will follow up with a paper information request for  
20 that, too.

21           JUDGE STEIN: I think we are taking e-mails.  
22 E-mail is fine.

23           MR. BERKLEE: Okay. In that case, that's all I  
24 have for now.

1 JUDGE STEIN: Thank you very much.

2 MR. BERKLEE: Thank you. Much appreciate it.

3 JUDGE STEIN: Thank you. Off the record.

4 (Discussion held off the record.)

5 JUDGE STEIN: We're going to pick up with a  
6 second Con Edison panel in an abbreviated version. Is  
7 that going to be on both customer service and  
8 communications and accounting and investments?

9 MR. MIKSAD: Just accounting and investment.

10 And relatively straightforward slides that we  
11 prepared for the presentation. Obviously we will answer  
12 questions to the extent we can in more detail, but the  
13 first slide just attempts to show the level which  
14 actually Assemblyman Brodsky's counsel was referring to.

15 The level of capital investment on Con Edison's  
16 transmission and distribution infrastructure over the  
17 period from 2003 through--actual through 2005 and  
18 projected for 2006. And you can see the numbers are  
19 there. 654 million in 2003 and rising this year to an  
20 anticipated almost \$1.3 billion capital investment.

21 Next slide just breaks those numbers down into  
22 three large buckets. Reliability and public safety in  
23 yellow; demand growth in blue, and then regulatory and  
24 environmental compliance, which includes EPA rules and

1 OSHA rules and all of those sorts of things, in pink up  
2 on top.

3 And just to give you a sense for how those  
4 dollars break out. Just shifting over, the next slide,  
5 to the maintenance side of the house. You can see,  
6 again, same period of time, 2003 through 2006,  
7 projected--I believe projected, right? Yes. And just  
8 broken into two buckets. Reliability and public safety  
9 is one large bucket and then that same regulatory and  
10 environmental compliance in yellow, ranging from \$456  
11 million in 2003 up to \$617 million in 2006 anticipated.

12 And that is the end of the presentation.

13 JUDGE STEIN: Do parties have questions on this  
14 presentation or this data? If so, do they want to pose  
15 the questions this evening? If so, how many minutes  
16 worth of questions do they have?

17 MR. WORDEN: Probably ten to 15 minutes for  
18 staff.

19 JUDGE STEIN: Anyone else? I suggest that what  
20 we do is complete this portion of the agenda and we will  
21 pick up tomorrow morning with the panel on customer  
22 service and communications and questions on that. And  
23 we will begin at 9:30.

24 Please proceed.

1 EXAMINATION BY MR. WORDEN:

2 Q. The company, from our understanding, primarily  
3 keeps your records by operating areas, right, of which  
4 there are four?

5 A. (Colonna) Yes. Four operating areas.

6 Q. And have you ever considered keeping those kind  
7 of records on a network by network basis?

8 A. (Colonna) We have looked at that recently, and we  
9 have talked about that over the years. We have been  
10 actually looking at how much we have done in the network  
11 over the past year and a half, specifically in Long  
12 Island City, but also across the networks.

13 So, we have been trying to quantify how much  
14 investment we have been making, first, by looking at how  
15 much work volumes we have completed or replaced, numbers  
16 of primary cable, secondary cable, and transformers, by  
17 network.

18 And it's working off engineering layouts and  
19 property accounting records to tell us the quantities of  
20 work and a cost per section of cable replaced in order  
21 to come up with approximate cost for each network.

22 From there we have to then evaluate how much  
23 infrastructure in our accounting system would be  
24 required to do this on a more automatic basis, but we

1 have been trying to get a sense of the investments we  
2 made in each network in terms of work volumes first.

3 (Miksad) One other point. I would--we don't want  
4 to make this an accounting nightmare in particular for  
5 our crews, the work crews. You can make this overly  
6 complicated. And if they have a particular account  
7 number for this network versus across the street at  
8 another network, it could bog them down, too.

9 We have--it's going to take a lot to get folks to  
10 make sure that they are putting the right account number  
11 and right work number in, that sort of thing. We don't  
12 want to make it an accounting maze in particular for the  
13 work group.

14 Q. So, I think what I heard you say was that you  
15 kind of backed into the 50 million by doing the best  
16 guess of how many primary feeders--how much primary  
17 feeder work was done in the Long Island City network and  
18 secondaries?

19 A. (Colonna) In that case I wouldn't say we  
20 backtracked by guessing how many--amount of work we did  
21 in the networks. We went through a meticulous--we went  
22 through for the last two years how much work we--how  
23 many sections of cable, how many transformers we  
24 actually replaced in Long Island City network.

1           It wasn't--that was not the back into number. We  
2 went layout by layout, project by project, and  
3 accumulated those work volumes. And then to use--we  
4 estimated the dollars based on an average cost per  
5 section replaced by that operating area. So, it wasn't  
6 an exact cost, but we were very comfortable with the  
7 amount of work we did, particularly in Long Island City  
8 over that recent time period.

9           Q.       Could you do a similar estimated cost for all  
10 networks?

11          A.       (Colonna) It would take time, but we could.

12          Q.       I am trying to get a sense of what we are talking  
13 about here.

14          A.       (Colonna) It took about two weeks to gather all  
15 the work we did in Long Island City. That was covering  
16 the period 2005 through the first six months of 2006,  
17 and we would have to go through 57 networks. I am not  
18 saying it's 57 times two weeks but...

19                 JUDGE STEIN: I would like to hear you finish  
20 that sentence.

21          A.       (Colonna) It's a fair amount of time, but I know  
22 it's--may be talking a couple months to gather all the  
23 information on all the networks depending on how far  
24 back we want to go in time.

1 Q. But I mean whenever--speaking of crews, whenever  
2 they work on feeders don't they record the feeder number  
3 as part of their work ticket, or is that not necessarily  
4 a part of it?

5 A. (Miksdad) Not necessarily on the work ticket. The  
6 accounting system, they don't need to do that. There is  
7 a whole other system for signing on a feeder number in  
8 order to make sure it's safe that is recorded there, but  
9 feeder log, feeder processing system, but not  
10 necessarily on the actual work units.

11 Q. Those two systems aren't linked together?

12 A. (Colonna) To follow up on John Miksal's last  
13 comment, it was going through those various logs in  
14 order to accumulate the amount of work that was  
15 completed in the Long Island City network.

16 That's what took the amount--that's what took the  
17 extensive amount of time, but the systems that capture  
18 cost and the various systems that report to feeder  
19 numbers are not integrated.

20 Q. Have you looked at doing it from a system  
21 standpoint since--in the last couple years?

22 A. (Colonna) We are still looking at that. It's, as  
23 John said, it would be fairly cumbersome in order to try  
24 to set up a system to cost segregate work done by

1 individual networks. You are talking in our case  
2 integrating many systems. We are still evaluating that.

3 Q. Have you looked at the costs of any other  
4 networks or is Long Island City the only one you have  
5 really done this kind of analysis on?

6 A. (Colonna) Right now we have looked at Long Island  
7 City and we were in the process of accumulating similar  
8 activity, how much work we have done in all the other  
9 networks to approximate--come up with a similar cost per  
10 network.

11 Q. So you are going through a one time process of  
12 estimating that so you can decide what to do going  
13 forward?

14 A. (Colonna) We are going through a one time process  
15 now to evaluate what--where all the information is, how  
16 much we have actually spent on these networks, and then  
17 evaluate what would it take to automate some of those  
18 processes going forward.

19 Q. When do you expect to have that done?

20 A. (Colonna) I don't have any specific time period  
21 yet, but we were trying to see if we can get something  
22 in place for tracking next year's work.

23 Q. Before your next budget cycle?

24 A. (Colonna) We are in that budget cycle now but

1 certainly before the next budget cycle.

2 Q. I meant the next one after that.

3 A. (Colonna) Okay.

4 JUDGE STEIN: Can somebody say a year associated  
5 with the next budget cycle year? Talking about the  
6 budget cycle for what year?

7 MR. COLONNA: This would be preparation in 2007  
8 for the 2008 budget.

9 JUDGE STEIN: Thank you very much. Just to  
10 clarify the record.

11 Q. And you are compiling information from the 2005  
12 through mid-2006 time period?

13 A. (Colonna) Same time period, so we can compare all  
14 the networks for the same time period.

15 Q. Do you plan on doing a correlation between  
16 expenditures and network performance after you compile  
17 this data?

18 A. (Colonna) My initial mission is to correlate  
19 expenditures and volumes of work and then to sit with  
20 the engineering folks to evaluate costs spent, work  
21 completed, and system performance, as a way of helping  
22 us to prioritize work for next year going forward.

23 (Miksad) So the answer is yes.

24 Q. In the company's press release associated with

1 the October 12th report you indicated you're investing  
2 \$58 million in the Long Island City network. Can you  
3 give us a breakdown of how that capital recovery,  
4 putting customers back in service, how that breaks down?

5 A. (Colonna) Of the \$58 million we reported, \$42  
6 million of that was expense, O&M, maintenance, the  
7 restoration of customers and of the system, and about 17  
8 million was capital investments.

9 Q. And that's through what time period?

10 A. (Colonna) That was through the period ending  
11 September.

12 Q. Do you have--

13 A. (Colonna) That doesn't include any of the money  
14 that we reimbursed, the company has reimbursed to  
15 customers already.

16 Q. Exclusive of claims?

17 A. (Colonna) That excludes the claims.

18 Q. Do you have a total estimate for what the \$58  
19 million is going to be?

20 A. (Colonna) In addition to the maintenance and  
21 capital work that I just quantified as another \$14  
22 million in claims through September reimbursed.

23 JUDGE STEIN: Just to clarify the record, we are  
24 talking about September 2006?

1 A. (Colonna) Yes. Through September 2006.

2 Q. I guess the question is: Have you projected what  
3 the total cost is going to be when that's done?

4 JUDGE STEIN: The total cost of?

5 Q. How the 58 million and 14 million are going to  
6 go. Right now it's 72 million.

7 A. (Colonna) For maintenance, we are estimating  
8 about \$54 million by the end of the year, through the  
9 end of this year, 2006. And capital, we are estimating  
10 approximately \$30 million in 2006.

11 (Rasmussen) As far as the claims are concerned,  
12 the \$14 million would expect to grow maybe another half  
13 a million dollars.

14 Q. You are talking roughly a hundred million?

15 A. (Rasmussen) Including the capital, right.

16 Q. Right. I am not an accountant. Round them off a  
17 little bit. How--can you break those different  
18 components down and talk about how each of those would  
19 be recovered and how it fit into rate structure and how  
20 that works?

21 JUDGE STEIN: Before we go ahead, I am a little  
22 confused by your last--I am not sure what was the  
23 question and what was the statement. You said we are  
24 talking about around a hundred million dollars. And you

1 said?

2 MR. RASMUSSEN: I agreed with his roughly \$100  
3 million.

4 A. (Rasmussen) On the rate side as to how those  
5 would be handled is any cost--as you know, we are in the  
6 middle of a three-year rate agreement. Rates were set  
7 through 2008. Any costs incurred between that period,  
8 unless we defer and ask for special recovery, would not  
9 be recovered in rates.

10 And these type costs which occurred during that  
11 rate plan and do not plan to recover and seek recovery  
12 for wouldn't have any special rate treatment.

13 As far as the claims are concerned, the same  
14 would be true on the claims. Would be approximately  
15 500,000 insurance claims we would expect to be  
16 recovering from the insurance company.

17 Q. So the O&M, I think you mentioned that was going  
18 to be a little over 50 million, so, essentially is that  
19 going to come out of your budget for this year from  
20 other O&M--

21 A. (Rasmussen) No. We will be substantially over  
22 budget in this year.

23 Q. If you look at the table where you outline the  
24 capital expenditures for electric distribution from 2000

1 to 2005, the last two years, 2003 to '4, goes up 100  
2 million and then 2004 to '5 goes up 150 million.

3 Can you touch on the reasons for those particular  
4 increases and the electric distribution, specifically  
5 budget?

6 A. (Miksad) Capital, right?

7 Q. Yes.

8 A. (Miksad) The '4 to '5, when we were on the  
9 conference call we talked about that shift, which is  
10 increased demand, increased reinforcement for demand,  
11 which includes the distribution work associated with the  
12 new substations that are coming on line. And as well as  
13 the--what I described as public safety reliability  
14 programs, which include programs that you are familiar  
15 with, Mike, the vented cover program and the secondary  
16 reliability program. I think that's--that's I think the  
17 majority of it.

18 Q. Has there been also a substantial increase in  
19 burnouts over those two years?

20 A. (Miksad) Burnouts we have to quantify. Burnout  
21 is a budget category in Con Edison's budget. It covers  
22 a lot of different things.

23 I think the name in some respects is a misnomer.  
24 It implies something failed or whatever, and there is

1 some of that in that bucket, but there are also a number  
2 of other things that are in that, which include main  
3 replacement or transformer replacement.

4 There is a conduit--there is a conduit line item  
5 in there also. So, there's some things that are not  
6 necessarily changing things that failed in that bucket.

7 So, I think what you are seeing is an increase in  
8 the category, but that is not equated to an increased  
9 number of failures on--either in terms of open  
10 automatics on the feeder side or transformer failures or  
11 secondary cable failures.

12 Q. Looking at the capital investments that you cut  
13 out of Long Island City--I am going to put some numbers  
14 together. I am not an accountant. Hopefully Nick can  
15 keep me in line here.

16 You said there was approximately 50 million spent  
17 in Long Island City between 2000-2005?

18 A. (Colonna) Correct.

19 Q. In capital total, right?

20 A. (Colonna) Total capital.

21 Q. And ten million total O&M over that period? I  
22 made that one up. You actually had a bigger number and  
23 you said it was 52 million in Queens, 21 percent in Long  
24 Island City?

1 A. (Miksad) Correct.

2 Q. So, that's on the order of ten million?

3 A. (Colonna) Correct.

4 Q. And to date and since the Long Island City event  
5 you spent 58 million, and you are projecting that to be  
6 about 100 million?

7 A. (Colonna) Capital and O&M, yes.

8 Q. I am talking 60 million over five or six-year  
9 period.

10 MR. HESLIN: Claims too.

11 Q. 60 million from 2000 to 2005, that's six years,  
12 85 million in capital and O&M since this event. So,  
13 from a financial budgeting perspective I guess I would  
14 be curious what your perspective on this outage and  
15 occurrence has been.

16 How you would compare the outage in terms of  
17 significance?

18 MS. KRAYESKE: Maybe you could try and rephrase  
19 the question. I am not really sure I understood it, and  
20 they kind of all look like they didn't understand it.

21 Q. I think we had some discussion about shutting  
22 down the network and the recovery period, how much work  
23 was done on Long Island City to put it back together.  
24 And I am trying to use a financial analysis to see

1 whether, from a financial perspective, whether you  
2 considered this to be a significant event or not, or  
3 outage. Extraordinary, if you want to call it that,  
4 unprecedented.

5 A. (Colonna) From a financial perspective it is a  
6 significant event in terms of the--particularly with the  
7 maintenance money, how much we have spent to date and  
8 how much we project to spend this year.

9 Q. And you wouldn't normally try to do things to end  
10 up in this kind of situation, obviously?

11 A. (Colonna) Sorry, I didn't understand the  
12 question.

13 Q. From a budgeting perspective, that's not how you  
14 would plan to plan your O&M activities, right?

15 A. (Colonna) Right. That is correct. We wouldn't  
16 budget for something this extraordinary.

17 Q. We have to seek a couple clarifications that I  
18 guess we are not sure we heard quite right on the  
19 recovery aspect. The O&M I think we are straight on.  
20 You have an O&M budget over the three-year period,  
21 somehow comes from that one way or the other?

22 A. (Rasmussen) Doesn't come from the budget. We are  
23 running over the budget.

24 Q. I understand that. I guess the question is:

1       Would you possibly seek recovery of anything over the  
2       budget?

3       A.       (Rasmussen) As I stated before, we are not  
4       deferring these costs to seek recovery.

5       Q.       What about capital?

6       A.       (Rasmussen) Capital we are treating somewhat also  
7       as normal capital. We are not seeking recovery of that  
8       capital while rates are in effect. Under our new rate  
9       plan we would assume this is additional capital. At  
10      that point we would include it in capital as any other  
11      dollars we invested over the years.

12     Q.       So, in the capital agreement we have in place  
13     there is a provision for I guess the simplistic point of  
14     view like a true up provision. This capital dollars  
15     would go into that money in terms of truing up?

16     A.       (Rasmussen) That is correct.

17     Q.       What about claims, how will they be dealt with?

18     A.       (Rasmussen) The claims that are not covered  
19     through our insurance, and we expect that to be--we are  
20     spending about 14 and a half million on claims, expect  
21     to get five million back in insurance.

22             The balance of nine and a half million would be  
23     similar to the O&M dollars I mentioned. We would incur  
24     them and not seek recovery of them in the future.

1           MR. WORDEN: I think we are all okay now. We are  
2 all set. Thank you.

3           JUDGE STEIN: I think that concludes our  
4 questions for today and concludes our panel for today.  
5 So, let's go off the record for a second.

6           (Discussion held off the record.)

7           JUDGE STEIN: First of all, I would like to thank  
8 all the participants today. I think this was a very  
9 full day, a productive day, and these were difficult  
10 issues for everyone involved.

11           And I would like to thank the parties, the  
12 speakers from Con Edison for their patience and  
13 forbearance. We are going to pick up tomorrow morning,  
14 Friday, October 27th, at 9:30 in the morning.

15           We will begin by finishing up follow up questions  
16 for no more than one hour total. Today staff, New York  
17 City, and Power for the People have asked for time for  
18 follow up questions. And then at 10:30, allowing time  
19 for a break, we will have the third and final Con Edison  
20 panel, which will be on the subject of customer service  
21 and communications.

22           We will take approximately 20 minutes for that  
23 panel, and we will then hear questions for no more than  
24 one hour from all parties collectively on the issues

1 raised in that panel, and we will adjourn tomorrow no  
2 later than noon.

3 That said, I now adjourn the technical conference  
4 that was held today for the evening and I will see you  
5 tomorrow morning.

6 (Conference adjourned.)

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Miksad/Mucci/Ketschke/DeSanti panel

Examination by:

Staff.....718

City.....779

Power for the People.....821

Attorney General.....838

CPB.....849

TransGas.....855

PULP.....867

Miksad/Mucci/Colonna/Rasmussen panel

Examination by:

Mr. Berklee.....870

Staff.....881

<b>\$</b>	<b>115,000</b> [2] - 690:20, 710:11 <b>11:30</b> [1] - 706:16 <b>11th</b> [1] - 872:13 <b>12</b> [9] - 679:12, 703:8, 703:19, 708:10, 723:18, 740:20, 777:23, 779:4, 876:6 <b>12-hour</b> [1] - 703:22 <b>12-year</b> [1] - 747:16 <b>120</b> [9] - 668:12, 668:15, 682:13, 682:22, 683:6, 685:4, 685:24, 686:10, 696:10 <b>1200</b> [4] - 688:13, 690:22, 782:6, 782:7 <b>12201-2222</b> [1] - 668:24 <b>12207-1715</b> [1] - 669:3 <b>12223</b> [2] - 668:4, 668:18 <b>125</b> [3] - 718:12, 744:12, 767:6 <b>12th</b> [6] - 732:24, 733:8, 789:16, 847:20, 870:9, 887:1 <b>13</b> [10] - 703:8, 703:19, 742:2, 785:23, 832:2, 833:17, 833:22, 876:6 <b>13,000</b> [6] - 686:21, 762:2, 762:4, 763:4, 819:7 <b>130</b> [1] - 776:15 <b>135</b> [2] - 718:13, 744:12 <b>138</b> [3] - 695:17, 859:18, 867:13 <b>14</b> [4] - 674:7, 742:4, 888:5, 894:20 <b>1400</b> [1] - 688:13 <b>15</b> [4] - 689:14, 762:21, 805:5, 880:17 <b>15,000</b> [4] - 708:15, 720:7, 720:8, 720:9 <b>150</b> [2] - 689:2, 890:2 <b>1500</b> [2] - 755:6, 756:4 <b>15:14</b> [1] - 815:6 <b>15:18</b> [1] - 815:6 <b>16</b> [1] - 674:7 <b>160</b> [1] - 717:10 <b>1600</b> [5] - 714:15, 755:20, 760:2, 832:15, 834:17 <b>16A</b> [1] - 813:4 <b>16th</b> [1] - 811:1 <b>17</b> [10] - 708:16, 709:18, 714:14,	720:7, 720:11, 720:18, 720:22, 720:23, 777:18, 887:7 <b>17th</b> [9] - 690:9, 702:14, 702:21, 714:13, 729:7, 799:7, 850:12, 858:9, 859:21 <b>18</b> [2] - 722:12, 741:23 <b>18:53</b> [2] - 799:7, 800:13 <b>18:55</b> [1] - 800:13 <b>18th</b> [3] - 702:21, 763:2, 839:7 <b>19</b> [1] - 747:15 <b>1965</b> [1] - 689:8 <b>1977</b> [1] - 689:8 <b>1990</b> [1] - 743:2 <b>1995</b> [2] - 871:20, 878:15 <b>1997</b> [1] - 689:20 <b>1999</b> [5] - 734:4, 838:11, 838:14, 875:24, 876:6 <b>19th</b> [3] - 702:21, 763:2, 815:8 <b>1Q12</b> [1] - 791:16 <b>1Q16</b> [3] - 777:11, 777:15, 777:18 <b>1Q17</b> [2] - 777:11, 777:15 <b>1st</b> [1] - 874:5	877:19, 879:17, 883:16, 886:11, 890:1, 892:11 <b>2006</b> [21] - 667:12, 670:5, 679:11, 679:12, 679:20, 679:23, 791:17, 791:18, 791:19, 791:22, 791:23, 810:18, 838:8, 879:18, 880:6, 880:11, 883:16, 887:24, 888:1, 888:9, 888:10 <b>2007</b> [3] - 813:8, 876:17, 886:7 <b>2008</b> [2] - 886:8, 889:7 <b>2015</b> [1] - 814:8 <b>208</b> [1] - 696:10 <b>20th</b> [1] - 755:10 <b>21</b> [3] - 847:9, 870:23, 891:23 <b>2101</b> [1] - 668:18 <b>21st</b> [2] - 690:10, 729:7 <b>22</b> [10] - 682:9, 683:8, 690:21, 693:22, 695:18, 704:16, 777:6, 832:13, 833:22, 847:8 <b>22222</b> [1] - 668:24 <b>225</b> [1] - 714:14 <b>24</b> [4] - 704:10, 791:13, 792:2, 792:24 <b>247</b> [1] - 842:8 <b>25</b> [12] - 679:20, 716:22, 717:8, 717:11, 740:11, 780:20, 780:22, 781:10, 781:13, 781:17, 782:6, 782:7 <b>25,000</b> [15] - 691:4, 696:13, 710:7, 715:6, 747:17, 761:5, 761:16, 765:11, 766:6, 769:13, 822:10, 831:3, 833:11, 834:18, 852:13 <b>250</b> [1] - 704:24 <b>25th</b> [3] - 729:11, 729:13, 731:2 <b>26</b> [7] - 667:12, 670:5, 786:10, 787:4, 787:14, 788:4 <b>265</b> [1] - 768:19 <b>27</b> [9] - 682:4, 686:6, 695:17, 696:9, 801:16, 808:8,	808:18, 859:14, 859:19 <b>27,000</b> [6] - 682:4, 683:11, 685:22, 686:9, 703:10, 703:14 <b>271</b> [1] - 674:20 <b>27th</b> [1] - 895:14 <b>2P</b> [1] - 802:14
<b>0</b>			<b>3</b>	
<b>1</b>	<b>1</b> [2] - 679:16, 679:17 <b>1.2</b> [1] - 688:19 <b>1.23</b> [1] - 778:6 <b>1.3</b> [1] - 879:20 <b>1.4</b> [1] - 688:19 <b>10,000</b> [1] - 798:14 <b>100</b> [2] - 890:1, 892:6 <b>100,000</b> [1] - 832:14 <b>1000</b> [9] - 688:12, 688:14, 688:16, 715:15, 715:16, 764:11, 851:13, 851:19 <b>10038</b> [1] - 668:21 <b>10271</b> [2] - 668:12, 668:15 <b>105</b> [1] - 679:20 <b>10:30</b> [1] - 895:18 <b>11</b> [1] - 806:20 <b>110</b> [1] - 668:21 <b>1100</b> [1] - 714:15			<b>3</b> [3] - 680:4, 775:20, 874:19 <b>30</b> [11] - 742:13, 742:14, 742:16, 743:14, 766:14, 767:2, 767:16, 767:23, 768:9, 865:22, 871:17 <b>300</b> [1] - 705:1 <b>32</b> [5] - 694:8, 776:8, 776:12, 776:13 <b>33</b> [1] - 766:15 <b>34</b> [1] - 876:5 <b>345</b> [3] - 867:6, 867:9, 867:13 <b>35</b> [5] - 767:2, 767:16, 767:23, 768:9, 776:12 <b>350</b> [1] - 705:1 <b>38</b> [1] - 851:11 <b>380</b> [1] - 705:4 <b>381</b> [1] - 812:4 <b>395</b> [4] - 690:17, 690:18, 810:18, 812:10 <b>3:00</b> [1] - 734:22
<b>2</b>			<b>4</b>	
		<b>2</b> [3] - 680:4, 782:14, 835:23 <b>20</b> [4] - 746:20, 749:23, 865:22, 895:22 <b>20/20</b> [1] - 792:16 <b>200</b> [1] - 704:24 <b>2000</b> [9] - 755:6, 756:4, 870:9, 871:19, 873:6, 876:24, 877:19, 889:24, 892:11 <b>2000-2005</b> [2] - 870:19, 891:17 <b>2002</b> [1] - 822:9 <b>2003</b> [7] - 689:9, 715:18, 879:17, 879:19, 880:6, 880:11, 890:1 <b>2004</b> [3] - 871:18, 871:21, 890:2 <b>2005</b> [12] - 689:20, 775:20, 870:10, 871:18, 871:21,	<b>4</b> [4] - 668:8, 775:20, 890:1, 890:8 <b>4,000</b> [2] - 700:23 <b>4-29</b> [1] - 789:15 <b>4/17/2006</b> [1] - 789:19 <b>40</b> [10] - 715:11, 715:14, 715:15, 749:23, 764:10, 764:15, 819:24, 820:6, 820:7, 851:14 <b>40-minute</b> [1] - 723:16 <b>400</b> [6] - 705:1, 705:3, 827:19, 828:3, 828:11, 828:12 <b>413</b> [2] - 795:16, 847:19 <b>429</b> [1] - 790:6 <b>447</b> [1] - 800:11 <b>45</b> [1] - 799:16 <b>460</b> [1] - 768:19	

4th [2] - 668:21, 741:23	853:18 800 [2] - 697:14, 866:2 81 [1] - 811:3 82 [3] - 741:20, 741:24, 742:6 85 [3] - 760:21, 761:14, 892:12 86 [7] - 779:23, 781:14, 781:20, 782:1, 810:21, 812:8, 812:21 86-degree [1] - 811:8 8:00 [1] - 702:14 8:38 [1] - 708:8	accept [1] - 864:24 acceptable [4] - 833:1, 837:12, 837:15, 852:22 accepting [1] - 695:5 access [1] - 854:10 accessible [2] - 802:12, 802:22 accommodate [1] - 717:10 accomplish [2] - 800:6, 834:14 accomplished [2] - 799:9, 801:5 accomplishes [1] - 802:18 according [2] - 794:7, 800:4 accordingly [2] - 675:21, 828:9 account [13] - 687:15, 688:21, 761:3, 761:7, 761:20, 766:14, 767:2, 822:17, 822:21, 827:22, 828:20, 882:6, 882:10 accountant [2] - 888:16, 891:14 accounting [8] - 681:12, 879:8, 879:9, 881:19, 881:23, 882:4, 882:12, 884:6 accounts [3] - 717:2, 762:4, 832:13 accumulate [1] - 884:14 accumulated [1] - 883:3 accumulating [1] - 885:7 accuracy [1] - 858:16 accurate [2] - 735:6, 737:23 achieve [2] - 671:7, 801:1 acquisition [1] - 854:9 act [2] - 681:20, 737:13 acting [1] - 840:15 action [8] - 681:9, 713:12, 716:21, 717:12, 776:23, 777:1, 813:4, 831:22 actions [1] - 837:20 active [4] - 677:4, 720:24, 783:3, 819:18 activities [5] - 788:14,	873:10, 873:12, 873:19, 893:14 activity [5] - 704:3, 732:6, 806:6, 832:17, 885:8 Actual [1] - 781:18 actual [19] - 685:14, 700:16, 704:22, 712:4, 730:7, 768:17, 785:3, 793:13, 794:23, 812:4, 812:6, 813:7, 823:8, 835:20, 859:1, 860:21, 874:11, 879:17, 884:10 actuality [1] - 683:24 add [12] - 726:9, 756:14, 775:5, 776:2, 794:1, 821:10, 827:4, 860:7, 861:24, 865:1, 865:2, 872:21 added [11] - 713:16, 714:3, 783:24, 784:1, 784:2, 840:10, 860:13, 861:8, 864:7, 864:9, 877:3 addition [10] - 693:12, 698:9, 709:4, 710:16, 710:21, 749:14, 780:8, 872:5, 872:19, 887:20 additional [24] - 684:14, 693:4, 697:4, 708:2, 709:7, 713:16, 721:18, 722:1, 730:5, 732:18, 744:3, 750:13, 766:11, 772:24, 790:1, 802:11, 813:5, 826:10, 826:13, 834:20, 835:5, 864:10, 877:3, 894:9 address [8] - 731:21, 742:23, 743:10, 744:8, 769:22, 771:3, 774:23, 776:23 addressed [1] - 806:2 adds [1] - 819:3 adequately [1] - 760:10 adjacent [4] - 692:14, 692:15, 694:12, 863:5 adjourn [2] - 896:1,	896:3 adjourned [1] - 896:6 adjust [2] - 812:7, 828:8 adjusted [3] - 800:22, 812:13, 861:23 adjustment [1] - 812:5 Administrative [2] - 667:15, 676:23 administrative [1] - 716:11 adopted [1] - 747:7 advance [1] - 818:6 advanced [1] - 835:6 adversarial [3] - 673:6, 673:13, 673:15 advise [1] - 725:12 advisory [1] - 697:23 Advocacy [1] - 668:14 advocating [2] - 724:11, 725:6 Aerospace [3] - 747:22, 748:10, 852:4 affairs [1] - 680:14 affect [9] - 684:24, 703:13, 734:8, 738:7, 738:18, 776:11, 821:13, 837:3, 842:23 affected [24] - 675:5, 690:9, 691:9, 695:8, 710:8, 714:17, 714:22, 715:3, 729:10, 737:2, 756:5, 769:13, 777:10, 787:1, 821:6, 821:7, 822:11, 822:12, 823:10, 823:14, 829:8, 831:13, 832:20 affects [2] - 706:1, 789:16 affirmed [1] - 679:5 affirmed [1] - 869:9 affordable [1] - 836:9 afforded [1] - 673:11 afternoon [14] - 680:8, 680:13, 680:16, 681:10, 702:24, 717:13, 756:11, 757:6, 763:16, 766:11, 785:18, 806:24, 816:2, 838:5 afterwards [1] - 737:22 AG's [1] - 849:16 age [1] - 744:23
<b>5</b>				
5 [2] - 890:2, 890:8 50 [9] - 716:15, 771:16, 771:20, 786:1, 786:24, 827:14, 882:15, 889:18, 891:16 500 [4] - 696:3, 716:13, 717:6, 819:4 500,000 [1] - 889:15 52 [1] - 891:23 54 [4] - 697:10, 697:21, 716:18 540 [1] - 668:24 546 [1] - 785:20 547 [1] - 786:9 57 [2] - 883:17, 883:18 58 [2] - 888:5, 892:5 5th [1] - 838:17	90 [6] - 667:10, 669:2, 691:7, 714:6, 748:17, 844:23 90,000 [3] - 710:12, 728:18, 831:12 914 [1] - 763:8 917 [1] - 763:9 95 [7] - 746:21, 746:23, 750:22, 852:6, 852:7, 853:3, 853:15 99.9 [1] - 671:6 9:00 [1] - 667:12 9:30 [3] - 676:15, 880:23, 895:14			
<b>6</b>				
6,000 [2] - 760:20, 761:10 60 [3] - 786:2, 892:8, 892:11 600 [3] - 743:15, 819:4, 819:8 601 [1] - 669:2 654 [1] - 879:19 675 [1] - 820:20 6:30 [1] - 806:24				
<b>7</b>				
7.2 [1] - 779:24 7/17 [1] - 789:22 70 [1] - 844:21 700 [2] - 708:12, 866:2 70s [1] - 748:18 718 [1] - 763:7 72 [1] - 888:6 75 [1] - 716:15 750 [1] - 692:20 77 [1] - 680:2 79 [1] - 852:21 79.8 [1] - 811:1 7:00 [1] - 806:24	a.m [1] - 667:12 abbreviated [1] - 879:6 ability [7] - 693:7, 713:1, 815:17, 815:18, 848:21, 849:18 able [19] - 688:2, 714:7, 735:19, 735:20, 738:7, 761:4, 767:20, 768:16, 774:6, 775:12, 776:4, 782:24, 800:1, 806:14, 807:1, 807:22, 828:8, 853:7, 860:21 Absolutely [1] - 811:24 absolutely [5] - 703:14, 736:8, 814:19, 834:9, 867:4 absorb [1] - 700:7 accelerated [3] - 717:15, 813:12, 813:16			
<b>8</b>				
8/18 [1] - 798:24 80 [13] - 717:3, 747:1, 748:17, 767:8, 767:10, 852:18, 853:1, 853:2, 853:9, 853:13, 853:15,				

<p><b>agency</b> [1] - 846:13  <b>agenda</b> [4] - 676:18, 680:24, 717:19, 880:20  <b>ago</b> [4] - 727:10, 748:3, 748:9, 854:10  <b>agree</b> [3] - 673:20, 675:11, 853:16  <b>agreed</b> [1] - 889:2  <b>agreement</b> [2] - 889:6, 894:12  <b>ahead</b> [4] - 675:22, 676:21, 868:19, 888:21  <b>aid</b> [1] - 716:15  <b>air</b> [9] - 686:18, 810:12, 833:8, 858:10, 858:12, 858:15, 860:7, 861:13, 863:11  <b>airport</b> [7] - 690:12, 804:14, 805:1, 805:2, 806:5, 807:3, 843:10  <b>alarm</b> [1] - 698:3  <b>alarming</b> [1] - 743:20  <b>Albany</b> [5] - 668:4, 668:18, 668:24, 669:3, 669:6  <b>alert</b> [2] - 829:22, 835:11  <b>algorithm</b> [3] - 765:3, 829:18, 829:22  <b>algorithms</b> [1] - 835:9  <b>alignment</b> [1] - 792:3  <b>alive</b> [9] - 738:21, 739:15, 739:21, 740:2, 740:24, 741:3, 781:2, 782:2, 785:20  <b>Alive</b> [1] - 739:10  <b>all..</b> [1] - 762:16  <b>allocated</b> [1] - 676:17  <b>allow</b> [4] - 713:17, 748:3, 774:21, 780:17  <b>allowed</b> [2] - 773:19, 859:16  <b>allowing</b> [1] - 895:18  <b>allows</b> [3] - 716:20, 774:12, 853:2  <b>alluded</b> [6] - 684:18, 829:18, 835:13, 872:3, 873:2, 876:2  <b>almost</b> [5] - 676:14, 832:14, 844:8, 856:19, 879:20  <b>alone</b> [1] - 844:21  <b>alternate</b> [3] - 804:17, 804:19, 804:22</p>	<p><b>alternating</b> [1] - 808:12  <b>altogether</b> [1] - 764:24  <b>Alyssa</b> [3] - 669:8, 678:15, 821:1  <b>ambulance</b> [1] - 836:22  <b>amended</b> [1] - 743:3  <b>amount</b> [20] - 674:6, 674:23, 732:3, 757:1, 759:7, 776:4, 778:7, 797:8, 819:3, 840:18, 844:18, 853:20, 871:5, 877:16, 882:20, 883:7, 883:21, 884:14, 884:16, 884:17  <b>amounted</b> [1] - 725:19  <b>amounts</b> [3] - 807:6, 827:2, 858:10  <b>amperes</b> [3] - 700:23, 798:15  <b>AMR</b> [14] - 751:4, 751:11, 751:12, 751:15, 751:19, 751:23, 752:7, 752:14, 752:15, 752:21, 753:4, 754:22, 759:20  <b>analysis</b> [28] - 680:15, 701:5, 721:22, 723:17, 723:20, 732:2, 732:3, 737:17, 742:5, 743:22, 744:19, 744:23, 775:5, 784:6, 796:9, 797:4, 802:1, 802:2, 802:17, 803:3, 803:5, 803:7, 803:14, 839:5, 840:18, 869:6, 885:5, 892:24  <b>analysis<sup>n</sup></b> [1] - 803:4  <b>analyzed</b> [2] - 715:5, 762:9  <b>Andrew</b> [1] - 870:3  <b>anecdotally</b> [1] - 765:24  <b>angling</b> [1] - 792:20  <b>announced</b> [1] - 751:17  <b>announcement</b> [1] - 759:24  <b>annual</b> [5] - 812:23, 873:6, 873:10, 874:8, 876:21  <b>annually</b> [1] - 877:19  <b>answer</b> [21] - 742:16,</p>	<p>750:3, 760:16, 768:4, 778:9, 784:21, 798:22, 800:20, 804:24, 807:22, 822:4, 848:16, 854:21, 855:1, 855:7, 859:1, 869:21, 871:24, 876:23, 879:11, 886:23  <b>answered</b> [5] - 729:17, 729:23, 783:8, 785:8, 821:16  <b>answering</b> [2] - 858:7, 878:2  <b>answers</b> [1] - 672:23  <b>anticipated</b> [5] - 701:13, 702:3, 730:1, 879:20, 880:11  <b>anticipating</b> [1] - 687:13  <b>anticipation</b> [1] - 770:3  <b>Anyway</b> [1] - 721:11  <b>anyways</b> [1] - 755:2  <b>apart</b> [2] - 694:8, 787:16  <b>apartment</b> [14] - 684:4, 696:11, 711:17, 754:15, 822:20, 823:2, 823:17, 823:22, 827:22, 827:23, 827:24, 828:3, 828:11, 828:24  <b>apartments</b> [1] - 828:6  <b>apologize</b> [2] - 741:6, 784:18  <b>apparent</b> [1] - 796:8  <b>appeal</b> [1] - 837:10  <b>appealed</b> [1] - 799:22  <b>appeals</b> [7] - 693:13, 706:4, 734:13, 765:22, 765:23, 844:20, 844:24  <b>appearance</b> [1] - 869:12  <b>appearances</b> [5] - 676:22, 677:1, 678:7, 678:10, 678:22  <b>APPEARANCES</b> [1] - 668:1  <b>appearing</b> [2] - 869:10, 869:14  <b>apples</b> [1] - 811:17  <b>application</b> [1] - 674:21  <b>applied</b> [6] - 786:14,</p>	<p>787:8, 787:18, 787:23, 796:22, 815:15  <b>apply</b> [2] - 788:13, 812:5  <b>applying</b> [1] - 743:5  <b>appreciate</b> [3] - 676:1, 717:15, 879:2  <b>approach</b> [3] - 812:21, 858:8, 863:24  <b>approaching</b> [1] - 744:16  <b>appropriate</b> [1] - 672:21  <b>appropriately</b> [1] - 675:13  <b>approximate</b> [2] - 881:21, 885:9  <b>April</b> [4] - 698:12, 791:18, 791:22, 874:5  <b>area</b> [44] - 673:2, 681:22, 681:24, 683:12, 689:24, 690:1, 694:1, 694:9, 695:13, 695:19, 696:17, 709:1, 712:5, 712:20, 712:21, 714:3, 714:23, 715:3, 746:11, 756:4, 758:12, 758:22, 758:23, 763:5, 763:6, 780:11, 783:1, 813:6, 817:15, 819:17, 824:11, 826:15, 829:23, 830:1, 842:4, 842:6, 861:4, 863:8, 863:18, 863:19, 871:13, 872:3, 877:12, 883:5  <b>areas</b> [33] - 690:2, 690:9, 696:15, 701:17, 701:19, 712:22, 714:21, 714:22, 737:13, 758:7, 758:19, 758:20, 759:5, 759:6, 759:8, 769:23, 770:8, 770:9, 770:23, 771:20, 771:24, 777:14, 780:12, 784:16, 808:4, 808:5, 818:1, 824:12, 827:8, 840:9, 881:3, 881:5  <b>argument</b> [2] - 674:10, 848:13</p>	<p><b>arm</b> [1] - 792:20  <b>arose</b> [2] - 772:9, 842:9  <b>array</b> [1] - 758:21  <b>aside</b> [2] - 820:4, 832:3  <b>asleep</b> [1] - 705:7  <b>aspect</b> [1] - 893:19  <b>aspects</b> [1] - 877:3  <b>Assembly</b> [1] - 869:15  <b>Assemblyman</b> [3] - 869:14, 870:12, 879:14  <b>asserting</b> [1] - 831:21  <b>assess</b> [1] - 763:22  <b>assessing</b> [1] - 737:3  <b>assessment</b> [3] - 765:11, 836:8, 836:17  <b>asset</b> [1] - 779:7  <b>assigned</b> [2] - 770:22, 783:2  <b>assist</b> [1] - 844:2  <b>Assistant</b> [1] - 668:2  <b>associated</b> [9] - 745:24, 746:10, 818:10, 853:22, 864:4, 875:22, 886:4, 886:24, 890:11  <b>assume</b> [4] - 742:18, 744:15, 814:13, 894:9  <b>assumption</b> [2] - 782:15, 782:19  <b>assure</b> [1] - 834:13  <b>Astoria</b> [15] - 695:15, 755:24, 756:15, 756:16, 758:18, 821:18, 865:10, 865:12, 865:15, 866:9, 867:3, 867:12  <b>AT&amp;T</b> [1] - 749:11  <b>attached</b> [1] - 865:10  <b>attack</b> [1] - 825:13  <b>attain</b> [1] - 726:2  <b>attempt</b> [8] - 749:3, 774:19, 786:14, 787:8, 787:18, 787:24, 788:1, 859:7  <b>attempted</b> [1] - 772:13  <b>attempts</b> [3] - 699:24, 750:4, 879:13  <b>attending</b> [1] - 832:22  <b>attention</b> [1] - 769:5  <b>Attorney</b> [7] - 668:10, 668:11, 668:14, 678:11, 838:2, 838:4, 897:6  <b>attorneys'</b> [1] - 670:7</p>
--	---	--	---	---

<p>attract [1] - 827:6  <b>attributable</b> [1] - 871:3  <b>attribute</b> [2] - 760:6, 863:10  <b>attributed</b> [2] - 863:2, 863:3  <b>attribution</b> [1] - 853:14  <b>audience</b> [1] - 765:4  <b>audio</b> [1] - 755:13  <b>Audit</b> [1] - 667:4  <b>August</b> [2] - 741:23, 875:19  <b>Austria</b> [2] - 677:15, 855:5  <b>AUSTRIA</b> [5] - 855:5, 855:6, 866:22, 867:1, 867:15  <b>Authorities</b> [1] - 869:15  <b>Authority</b> [9] - 805:12, 805:19, 805:24, 842:15, 843:20, 845:1, 845:18, 845:21, 846:1  <b>authority</b> [1] - 849:18  <b>auto</b> [13] - 732:7, 732:9, 733:2, 735:9, 772:2, 773:13, 774:15, 775:4, 775:21, 796:24, 797:1, 798:8, 799:8  <b>automate</b> [1] - 885:17  <b>automated</b> [2] - 713:4, 800:22  <b>automatic</b> [2] - 724:1, 881:24  <b>automatically</b> [2] - 778:21, 837:8  <b>automatics</b> [1] - 891:10  <b>autopsied</b> [1] - 741:9  <b>autos</b> [9] - 772:7, 775:19, 776:17, 784:8, 784:9, 795:16, 795:18, 809:11, 847:19  <b>available</b> [13] - 673:14, 721:24, 722:5, 737:2, 782:20, 806:7, 807:6, 807:12, 807:21, 815:1, 836:9, 866:6, 866:9  <b>Avenue</b> [2] - 755:23, 756:8  <b>average</b> [10] - 688:21, 689:3, 811:2, 811:3, 811:20, 811:23,</p>	<p>811:24, 829:5, 876:5, 883:4  <b>Avian</b> [1] - 877:6  <b>avoid</b> [2] - 773:3, 791:1  <b>awaiting</b> [1] - 781:19  <b>aware</b> [2] - 759:14, 845:5  <b>aways</b> [1] - 785:14  <b>awhile</b> [1] - 732:1  <b>axis</b> [1] - 704:24</p> <p style="text-align: center;"><b>B</b></p> <p><b>backdrop</b> [2] - 816:19, 819:19  <b>backed</b> [3] - 697:2, 738:24, 882:15  <b>backfeed</b> [20] - 738:21, 739:10, 739:15, 739:21, 739:22, 740:5, 740:8, 741:3, 771:8, 771:11, 771:13, 771:23, 775:16, 786:14, 787:24, 788:2, 788:8, 788:14, 788:18, 788:21  <b>backfeeding</b> [2] - 788:4, 788:11  <b>backfeeds</b> [6] - 740:2, 740:24, 785:20, 786:24, 787:24, 788:12  <b>background</b> [1] - 804:11  <b>backtracked</b> [1] - 882:20  <b>bad</b> [1] - 832:24  <b>BAE</b> [2] - 748:9, 852:4  <b>baffled</b> [1] - 796:4  <b>baggage</b> [1] - 806:2  <b>BAKER</b> [1] - 678:20  <b>Baker</b> [1] - 678:20  <b>balance</b> [2] - 814:4, 894:22  <b>band</b> [4] - 736:10, 736:12, 736:15, 736:18  <b>bands</b> [1] - 809:8  <b>bank</b> [1] - 858:2  <b>bank's</b> [1] - 780:14  <b>banks</b> [6] - 742:1, 780:12, 780:14, 781:18, 863:19, 865:24  <b>Banks</b> [1] - 781:22  <b>bare</b> [1] - 753:3  <b>BARNHART</b> [2] -</p>	<p>826:1, 829:10  <b>Barnhart</b> [1] - 826:2  <b>baseboard</b> [1] - 849:4  <b>based</b> [16] - 674:1, 687:7, 687:11, 743:14, 745:18, 760:20, 761:18, 783:2, 783:3, 806:16, 810:19, 812:6, 812:9, 829:5, 836:9, 883:4  <b>Based</b> [1] - 750:17  <b>basement</b> [1] - 754:16  <b>basements</b> [1] - 835:14  <b>basis</b> [9] - 746:23, 776:7, 801:13, 819:7, 873:6, 873:10, 876:21, 881:7, 881:24  <b>battery</b> [1] - 848:19  <b>Battery</b> [1] - 838:24  <b>battle</b> [3] - 704:9, 706:14, 706:17  <b>battling</b> [1] - 703:24  <b>Bay</b> [2] - 807:11, 843:15  <b>bear</b> [1] - 850:13  <b>beat</b> [1] - 709:20  <b>became</b> [7] - 692:7, 692:21, 695:23, 695:24, 696:1, 733:11, 756:19  <b>become</b> [2] - 770:24, 791:22  <b>becomes</b> [2] - 685:15, 686:11  <b>began</b> [6] - 733:9, 741:19, 743:5, 769:20, 770:2, 806:23  <b>begin</b> [8] - 677:2, 677:9, 692:12, 692:16, 807:2, 869:3, 880:23, 895:15  <b>beginning</b> [6] - 670:5, 779:22, 800:13, 815:8, 837:7, 864:1  <b>behalf</b> [5] - 670:12, 675:23, 675:24, 677:13, 779:17  <b>behind</b> [1] - 823:16  <b>beings</b> [1] - 837:4  <b>belabor</b> [2] - 783:7, 862:17  <b>below</b> [4] - 700:23, 812:11, 812:12, 835:15  <b>bench</b> [1] - 792:20</p>	<p><b>Bending</b> [1] - 792:22  <b>benefit</b> [4] - 765:15, 814:9, 814:10, 823:23  <b>benefits</b> [3] - 820:3, 820:15, 836:3  <b>Berklee</b> [4] - 869:10, 869:11, 869:13, 870:6  <b>BERKLEE</b> [8] - 869:13, 869:22, 870:7, 870:8, 877:23, 878:12, 878:23, 879:2  <b>Berklee</b>.....  <b>870</b> [1] - 897:14  <b>best</b> [7] - 718:3, 748:15, 754:11, 754:20, 763:14, 804:22, 882:15  <b>better</b> [11] - 683:9, 685:13, 689:18, 714:7, 764:14, 767:14, 789:23, 798:19, 834:19, 851:6  <b>Between</b> [1] - 694:4  <b>between</b> [25] - 685:11, 694:20, 698:11, 743:17, 748:8, 752:9, 755:6, 771:5, 781:13, 791:22, 818:20, 828:10, 831:21, 832:4, 832:8, 834:6, 837:3, 841:21, 843:3, 854:4, 854:13, 870:9, 886:15, 889:7, 891:17  <b>beyond</b> [4] - 728:1, 808:13, 861:8, 864:15  <b>bid</b> [1] - 817:16  <b>big</b> [9] - 711:6, 738:10, 738:11, 739:13, 809:20, 831:2, 831:4, 864:9, 872:10  <b>bigger</b> [2] - 697:12, 891:22  <b>biggest</b> [2] - 742:15, 775:24  <b>bill</b> [1] - 828:8  <b>billion</b> [4] - 751:22, 835:23, 879:20  <b>biological</b> [1] - 877:9  <b>bit</b> [15] - 680:22, 681:1, 682:16, 683:2, 697:11, 697:12, 702:9, 711:10, 713:11,</p>	<p>780:1, 792:1, 792:14, 832:10, 844:6, 888:17  <b>black</b> [3] - 701:23, 758:22, 809:3  <b>blackout</b> [7] - 689:7, 689:8, 689:9, 689:10, 715:18, 715:22, 838:16  <b>blamed</b> [1] - 772:3  <b>blanking</b> [1] - 851:24  <b>block</b> [6] - 683:23, 685:5, 758:10, 758:17, 758:24, 759:1  <b>blocks</b> [1] - 767:24  <b>blood</b> [1] - 707:9  <b>blow</b> [5] - 690:1, 787:6, 787:8, 787:17, 787:18  <b>blown</b> [2] - 782:4, 876:19  <b>blue</b> [7] - 682:12, 683:18, 683:19, 685:24, 700:20, 704:22, 879:23  <b>Board</b> [5] - 668:16, 668:17, 677:17, 838:2, 849:11  <b>body</b> [1] - 790:2  <b>bog</b> [1] - 882:8  <b>Bonder</b> [2] - 668:23, 677:22  <b>bones</b> [1] - 753:4  <b>BONILLA</b> [4] - 678:15, 820:24, 822:6, 831:18  <b>Bonilla</b> [3] - 669:8, 678:15, 821:1  <b>borough</b> [4] - 870:22, 871:13, 878:17, 878:18  <b>boroughs</b> [1] - 689:23  <b>Boston</b> [1] - 716:14  <b>bottom</b> [4] - 712:12, 792:10, 792:14, 792:16  <b>bought</b> [2] - 747:20, 747:21  <b>boundaries</b> [2] - 690:4, 808:13  <b>Bowery</b> [2] - 807:11, 843:15  <b>box</b> [3] - 686:8, 720:20, 769:17  <b>Box</b> [1] - 668:24  <b>boxes</b> [3] - 682:12, 694:21, 720:10  <b>BQE</b> [1] - 690:5  <b>branch</b> [1] - 777:17</p>
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<p><b>branches</b> [1] - 710:21</p> <p><b>breadth</b> [1] - 750:17</p> <p><b>break</b> [17] - 683:4, 763:4, 763:10, 779:11, 795:6, 795:10, 816:1, 828:17, 837:23, 866:17, 866:20, 873:11, 873:16, 876:21, 880:4, 888:17, 895:19</p> <p><b>breakdown</b> [2] - 871:15, 887:3</p> <p><b>breaker</b> [39] - 696:23, 697:1, 697:3, 697:4, 697:8, 697:14, 697:15, 697:18, 697:19, 697:22, 698:1, 698:6, 698:10, 698:11, 698:12, 698:21, 698:23, 699:20, 700:5, 711:16, 711:17, 711:18, 774:6, 774:10, 789:10, 789:13, 789:17, 790:2, 790:9, 791:17, 791:20, 791:21, 792:2, 793:3, 794:2, 794:5, 797:7, 797:10</p> <p><b>breakers</b> [16] - 695:19, 697:5, 697:24, 791:7, 791:8, 791:11, 793:1, 793:2, 793:7, 793:9, 793:17, 793:20, 793:23, 794:21, 806:9</p> <p><b>breaks</b> [4] - 682:24, 711:15, 879:21, 887:4</p> <p><b>breathing</b> [1] - 837:4</p> <p><b>Brian</b> [2] - 669:6, 678:19</p> <p><b>bridge</b> [2] - 690:7</p> <p><b>brief</b> [2] - 670:6, 846:17</p> <p><b>briefly</b> [2] - 771:7, 809:1</p> <p><b>briefs</b> [1] - 846:14</p> <p><b>bring</b> [11] - 685:17, 693:5, 702:5, 706:24, 716:10, 721:21, 722:9, 722:10, 804:8, 834:22, 853:22</p> <p><b>bringing</b> [5] - 703:22, 704:10, 710:1, 767:7, 783:5</p>	<p><b>brings</b> [3] - 685:19, 699:17, 702:5</p> <p><b>British</b> [5] - 747:22, 748:10, 852:3, 854:5, 854:13</p> <p><b>broad</b> [3] - 871:16, 872:18, 872:23</p> <p><b>broadcast</b> [3] - 712:18, 713:19, 759:24</p> <p><b>Broadway</b> [3] - 668:12, 668:15, 668:24</p> <p><b>Brodsky</b> [1] - 869:14</p> <p><b>Brodsky's</b> [1] - 879:14</p> <p><b>broken</b> [4] - 683:4, 683:16, 878:16, 880:8</p> <p><b>Bronx</b> [2] - 716:6, 730:4</p> <p><b>Bronx-Westchester</b> [1] - 716:6</p> <p><b>Brook</b> [1] - 867:10</p> <p><b>Brooklyn</b> [17] - 680:9, 680:12, 682:3, 696:4, 716:6, 719:6, 719:10, 721:4, 724:16, 755:22, 755:23, 763:7, 770:11, 815:2, 815:8, 841:22, 870:11</p> <p><b>Brooklyn-Queens</b> [12] - 680:9, 680:12, 696:4, 716:6, 719:6, 719:10, 721:4, 724:16, 815:2, 815:8, 841:22, 870:11</p> <p><b>brought</b> [4] - 702:24, 703:4, 711:12, 716:12</p> <p><b>brown</b> [4] - 701:23, 823:3, 833:4, 848:14</p> <p><b>bucket</b> [3] - 880:9, 891:1, 891:6</p> <p><b>buckets</b> [2] - 879:22, 880:8</p> <p><b>budget</b> [16] - 885:23, 885:24, 886:1, 886:5, 886:6, 886:8, 889:19, 889:22, 890:5, 890:21, 893:16, 893:20, 893:22, 893:23, 894:2</p> <p><b>budgeting</b> [2] - 892:13, 893:13</p> <p><b>budgets</b> [1] - 869:8</p> <p><b>build</b> [2] - 750:1,</p>	<p>814:15</p> <p><b>building</b> [13] - 684:4, 710:13, 749:13, 754:15, 823:23, 827:11, 827:23, 828:3, 828:11, 843:13, 844:17, 861:1, 864:8</p> <p><b>buildings</b> [9] - 686:18, 817:18, 817:19, 826:17, 826:20, 827:16, 827:18, 827:24</p> <p><b>built</b> [3] - 684:19, 777:17, 817:3</p> <p><b>bulb</b> [2] - 823:3, 833:4</p> <p><b>burden</b> [1] - 878:8</p> <p><b>Bureau</b> [1] - 668:11</p> <p><b>burn</b> [3] - 726:5, 850:21, 850:22</p> <p><b>burning</b> [1] - 727:11</p> <p><b>Burnout</b> [1] - 890:20</p> <p><b>burnouts</b> [1] - 890:19</p> <p><b>Burnouts</b> [1] - 890:20</p> <p><b>Burns</b> [3] - 668:13, 678:12, 838:4</p> <p><b>BURNS</b> [4] - 678:11, 838:3, 845:8, 846:15</p> <p><b>burns</b> [1] - 726:4</p> <p><b>bus</b> [7] - 783:10, 783:11, 783:15, 783:18, 799:8, 801:16, 801:17</p> <p><b>bushing</b> [1] - 742:8</p> <p><b>bushings</b> [4] - 696:8, 696:9, 696:19, 742:12</p> <p><b>business</b> [7] - 677:6, 748:5, 748:12, 754:11, 754:20, 871:12</p> <p><b>businesses</b> [1] - 705:7</p> <p><b>Busy</b> [1] - 760:19</p> <p><b>busy</b> [5] - 713:13, 760:19, 761:12, 761:13, 832:22</p> <p><b>but..</b> [3] - 782:10, 819:11, 883:18</p> <p><b>button</b> [1] - 801:9</p> <p><b>BY</b> [26] - 718:1, 731:19, 754:4, 763:12, 765:9, 779:16, 785:17, 789:9, 794:3, 795:13, 799:4, 804:10, 808:23, 814:20, 820:24, 826:1, 829:10, 831:18, 838:3,</p>	<p>846:19, 849:15, 855:6, 867:1, 867:18, 870:8, 881:1</p> <p><b>bypass</b> [1] - 716:22</p> <p style="text-align: center;"><b>C</b></p> <p><b>C2</b> [1] - 697:23</p> <p><b>cabinet</b> [4] - 697:10, 697:12, 697:14, 792:4</p> <p><b>cabinets</b> [2] - 695:15, 792:6</p> <p><b>cable</b> [34] - 685:5, 685:23, 685:24, 687:24, 692:20, 702:23, 707:7, 707:18, 716:15, 717:8, 725:22, 742:7, 775:14, 778:20, 795:21, 795:23, 797:17, 806:17, 810:6, 821:20, 821:21, 847:21, 861:7, 862:1, 862:8, 871:7, 871:8, 871:9, 873:5, 881:16, 881:20, 882:23, 891:11</p> <p><b>cables</b> [20] - 683:19, 683:22, 683:24, 684:1, 685:12, 685:15, 686:2, 693:3, 693:24, 694:6, 696:16, 702:2, 737:21, 824:18, 838:9, 840:4, 840:5, 863:5, 872:15</p> <p><b>calculated</b> [5] - 718:11, 746:1, 785:3, 799:15</p> <p><b>calculations</b> [2] - 785:2, 810:13</p> <p><b>California</b> [4] - 751:16, 752:2, 752:4, 835:21</p> <p><b>callers</b> [2] - 761:10, 762:18</p> <p><b>Campaign</b> [3] - 669:7, 678:16, 821:3</p> <p><b>cannot</b> [2] - 698:10</p> <p><b>cantilever</b> [1] - 792:13</p> <p><b>cap</b> [3] - 686:4, 781:2, 782:2</p> <p><b>capabilities</b> [2] - 691:12, 775:14</p> <p><b>capability</b> [10] - 714:3, 726:21, 777:7, 807:8, 814:2, 847:10, 857:14,</p>	<p>857:20, 857:22, 861:8</p> <p><b>capable</b> [2] - 695:5, 832:9</p> <p><b>capacitor</b> [2] - 863:19, 865:24</p> <p><b>capacitors</b> [1] - 865:22</p> <p><b>Capacity</b> [1] - 857:10</p> <p><b>capacity</b> [21] - 670:9, 678:8, 679:3, 688:1, 716:4, 776:10, 787:6, 806:16, 818:15, 818:16, 818:23, 847:14, 848:19, 856:21, 857:5, 857:7, 857:8, 857:9, 858:2, 863:16</p> <p><b>Capital</b> [3] - 890:6, 892:7, 894:6</p> <p><b>capital</b> [24] - 869:8, 870:12, 871:1, 872:2, 878:14, 879:15, 879:20, 887:3, 887:8, 887:21, 888:9, 888:15, 889:24, 891:12, 891:19, 891:20, 892:12, 894:5, 894:7, 894:8, 894:9, 894:10, 894:12, 894:14</p> <p><b>capture</b> [1] - 884:17</p> <p><b>captured</b> [1] - 700:16</p> <p><b>capturing</b> [1] - 687:5</p> <p><b>car</b> [1] - 833:9</p> <p><b>card</b> [2] - 677:6, 816:1</p> <p><b>carried</b> [6] - 692:13, 692:17, 694:11, 695:6, 846:24, 847:1</p> <p><b>carrier</b> [4] - 747:9, 749:14, 760:21, 762:8</p> <p><b>carriers</b> [1] - 805:21</p> <p><b>carries</b> [2] - 694:5, 846:24</p> <p><b>carry</b> [3] - 694:17, 702:2, 702:3</p> <p><b>cascade</b> [3] - 773:3, 816:12, 839:18</p> <p><b>case</b> [38] - 670:1, 674:15, 676:11, 676:24, 681:23, 682:3, 682:8, 683:1, 686:6, 693:21, 694:19, 696:20, 697:1, 697:6, 698:13, 698:24, 708:19, 732:14, 753:19, 754:11,</p>
---	---	---	--	---

<p>754:20, 782:3, 787:20, 791:7, 792:11, 793:21, 797:21, 801:16, 814:6, 823:2, 828:4, 851:1, 856:21, 878:23, 882:19, 885:1 <b>Case</b> [2] - 667:4, 667:6 <b>cases</b> [29] - 675:9, 692:22, 698:3, 702:4, 718:12, 722:7, 737:12, 748:18, 772:13, 772:17, 772:18, 772:20, 772:22, 783:20, 788:11, 793:22, 797:6, 797:18, 797:20, 797:21, 798:15, 844:8, 855:13, 861:6, 862:7, 868:18 <b>catch</b> [1] - 789:21 <b>categories</b> [6] - 817:8, 871:16, 872:2, 872:18, 872:23, 873:18 <b>categorization</b> [1] - 772:7 <b>categorize</b> [1] - 725:18 <b>categorized</b> [1] - 871:4 <b>Category</b> [1] - 874:19 <b>category</b> [4] - 776:15, 876:24, 890:21, 891:8 <b>catechetic</b> [1] - 743:8 <b>caught</b> [3] - 694:6, 748:8, 789:20 <b>caused</b> [18] - 694:7, 694:22, 696:22, 702:4, 741:13, 775:19, 784:9, 792:13, 792:14, 796:12, 797:3, 797:5, 797:16, 797:24, 833:23, 840:4, 847:22, 848:1 <b>causes</b> [5] - 693:4, 700:6, 776:10, 780:1, 797:10 <b>causing</b> [4] - 700:10, 784:4, 797:18, 797:22 <b>CD</b> [1] - 679:13 <b>CDPD</b> [1] - 749:12 <b>cell</b> [7] - 749:16, 749:17, 749:22, 749:23, 763:8,</p>	<p>763:9, 835:17 <b>census</b> [1] - 823:20 <b>center</b> [18] - 719:6, 719:16, 720:14, 721:5, 724:17, 747:13, 755:11, 755:17, 756:16, 757:19, 758:4, 771:5, 801:8, 815:2, 840:14, 841:22, 841:23, 877:18 <b>centers</b> [3] - 713:6, 716:14, 805:17 <b>centigrade</b> [1] - 718:12 <b>central</b> [6] - 805:11, 806:14, 807:2, 845:11, 846:3, 846:14 <b>CERC</b> [5] - 755:17, 757:18, 758:1, 769:6, 769:10 <b>certain</b> [14] - 674:23, 700:5, 751:12, 771:24, 797:13, 805:13, 805:14, 808:5, 824:23, 829:12, 829:15, 830:22, 855:13, 856:1 <b>certainly</b> [8] - 744:24, 756:24, 774:22, 774:23, 786:12, 805:13, 807:5, 886:1 <b>Certainly</b> [1] - 853:18 <b>Chablis</b> [1] - 725:7 <b>chair</b> [1] - 670:11 <b>Chairman</b> [1] - 869:14 <b>challenge</b> [3] - 827:6, 835:16, 840:16 <b>challenges</b> [1] - 835:12 <b>Chan</b> [1] - 677:11 <b>change</b> [6] - 687:24, 749:22, 790:3, 810:16, 856:10, 859:16 <b>changed</b> [3] - 701:2, 701:6, 734:16 <b>changeout</b> [1] - 872:15 <b>changer</b> [3] - 801:12, 801:15, 857:1 <b>changers</b> [6] - 801:11, 801:12, 856:10, 856:14, 856:20, 856:22 <b>changes</b> [7] - 736:1, 736:2, 736:3, 792:12, 793:14,</p>	<p>802:5, 856:7 <b>changing</b> [6] - 749:20, 817:20, 817:21, 818:21, 857:8, 891:6 <b>Chanoch</b> [1] - 668:6 <b>characteristics</b> [2] - 685:7, 783:22 <b>characterized</b> [1] - 760:6 <b>charge</b> [2] - 820:15, 842:4 <b>Charlie</b> [4] - 668:10, 678:12, 838:6, 846:16 <b>chart</b> [2] - 759:22, 851:13 <b>check</b> [7] - 746:3, 746:12, 756:10, 766:16, 766:17, 849:8, 861:2 <b>chilling</b> [1] - 671:3 <b>chime</b> [1] - 755:9 <b>CHIPS</b> [2] - 749:14, 749:15 <b>choices</b> [1] - 713:1 <b>choose</b> [1] - 673:4 <b>chose</b> [1] - 868:16 <b>Church</b> [1] - 667:10 <b>churned</b> [1] - 762:10 <b>CIOAs</b> [1] - 814:17 <b>circuit</b> [15] - 695:19, 696:22, 697:8, 697:24, 698:6, 698:15, 698:17, 699:1, 699:22, 700:9, 789:16, 790:6, 791:1, 794:1, 821:20 <b>circuits</b> [5] - 699:21, 699:23, 699:24, 792:18, 793:10 <b>circumstances</b> [2] - 672:9, 721:2 <b>Citibank</b> [1] - 844:16 <b>Citicorp</b> [1] - 843:13 <b>cities</b> [1] - 751:4 <b>City</b> [117] - 668:19, 670:3, 673:1, 677:21, 677:23, 680:2, 680:11, 680:21, 681:3, 681:24, 682:1, 682:8, 683:9, 686:18, 686:23, 689:9, 689:21, 689:22, 689:24, 690:3, 690:14, 692:21, 694:1, 700:21, 701:16, 702:17, 708:15,</p>	<p>710:18, 710:23, 711:3, 711:4, 717:5, 720:11, 725:15, 725:20, 725:21, 727:7, 728:3, 729:4, 729:15, 734:4, 739:15, 740:19, 741:10, 741:14, 742:23, 743:7, 743:11, 743:23, 744:9, 744:10, 755:5, 758:18, 762:19, 762:21, 762:23, 767:4, 767:9, 769:19, 773:12, 774:3, 775:11, 775:21, 776:6, 777:3, 777:10, 778:1, 778:3, 778:6, 778:7, 786:5, 793:17, 793:18, 793:20, 799:1, 804:12, 805:3, 805:7, 812:23, 813:14, 824:1, 824:5, 824:13, 825:10, 825:22, 826:9, 826:12, 826:14, 826:21, 838:10, 838:24, 842:1, 842:15, 850:12, 858:19, 866:7, 870:13, 870:17, 870:20, 870:24, 871:2, 874:18, 881:12, 882:17, 882:24, 883:7, 883:15, 884:15, 885:4, 885:7, 887:2, 891:13, 891:17, 891:24, 892:4, 892:23, 895:17 <b>city</b> [16] - 715:7, 751:7, 763:15, 763:20, 764:17, 779:10, 779:18, 779:19, 830:3, 837:11, 845:2, 851:22, 854:24, 875:7, 877:8, 878:17 <b>City's</b> [1] - 779:24 <b>city's</b> [2] - 726:23, 763:21 <b>City</b>..... <b>779</b> [1] - 897:4 <b>claims</b> [10] - 887:16, 887:17, 887:22, 888:11, 889:13, 889:14, 889:15,</p>	<p>894:17, 894:18, 894:20 <b>Claims</b> [1] - 892:10 <b>clarifications</b> [2] - 718:2, 893:17 <b>clarified</b> [1] - 713:24 <b>clarify</b> [12] - 718:3, 729:5, 762:14, 771:7, 781:10, 783:9, 798:18, 833:17, 856:4, 859:12, 886:10, 887:23 <b>clarifying</b> [1] - 862:17 <b>classify</b> [1] - 768:2 <b>clear</b> [10] - 728:23, 740:8, 786:14, 787:24, 788:1, 788:3, 788:13, 788:18, 795:18, 852:24 <b>cleared</b> [1] - 788:8 <b>clearer</b> [4] - 685:20, 784:3, 790:4, 803:1 <b>clearing</b> [2] - 739:23, 788:20 <b>clearly</b> [3] - 800:21, 805:13, 863:18 <b>clears</b> [1] - 686:12 <b>clock</b> [1] - 842:8 <b>close</b> [5] - 698:10, 699:7, 736:18, 797:7, 810:8 <b>closed</b> [6] - 705:8, 746:17, 771:19, 808:19, 808:22, 844:16 <b>closer</b> [1] - 694:18 <b>closes</b> [1] - 700:5 <b>closest</b> [4] - 695:3, 847:2, 847:11, 867:10 <b>closing</b> [1] - 806:8 <b>cloud</b> [1] - 832:9 <b>clumps</b> [2] - 815:6, 815:9 <b>cluttered</b> [1] - 685:15 <b>co</b> [1] - 827:16 <b>co-op</b> [1] - 827:16 <b>Coast</b> [1] - 874:17 <b>coastal</b> [2] - 874:15, 875:1 <b>coating</b> [2] - 743:3 <b>cocked</b> [1] - 792:8 <b>cocking</b> [1] - 792:22 <b>code</b> [2] - 685:21, 763:5 <b>codes</b> [1] - 763:6 <b>coding</b> [1] - 721:20 <b>coil</b> [5] - 698:18,</p>
--	---	---	--	--

<p>698:20, 698:21, 797:22</p> <p><b>colls</b> [4] - 696:7, 697:17, 797:21</p> <p><b>cold</b> [2] - 708:24, 809:21</p> <p><b>collaborative</b> [1] - 675:3</p> <p><b>collateral</b> [1] - 837:13</p> <p><b>collected</b> [1] - 715:4</p> <p><b>collectively</b> [2] - 836:2, 895:24</p> <p><b>collectors</b> [1] - 681:21</p> <p><b>COLONNA</b> [2] - 869:5, 886:7</p> <p><b>Colonna</b> [35] - 869:5, 869:9, 870:15, 870:21, 871:4, 872:22, 881:5, 881:8, 882:19, 883:11, 883:14, 883:21, 884:12, 884:22, 885:6, 885:14, 885:20, 885:24, 886:3, 886:13, 886:18, 887:5, 887:10, 887:13, 887:17, 887:20, 888:1, 888:7, 891:18, 891:20, 892:3, 892:7, 893:5, 893:11, 893:15</p> <p><b>color</b> [1] - 685:21</p> <p><b>combination</b> [2] - 746:7, 746:9</p> <p><b>comfortable</b> [1] - 883:6</p> <p><b>coming</b> [19] - 696:9, 704:3, 704:7, 712:16, 716:9, 721:23, 744:4, 749:18, 757:4, 772:24, 783:13, 827:11, 834:18, 855:23, 862:18, 863:8, 865:15, 890:12</p> <p><b>command</b> [13] - 719:4, 719:9, 722:4, 725:4, 725:5, 757:17, 757:22, 757:23, 841:21, 845:11, 846:3, 846:8, 846:14</p> <p><b>commander</b> [1] - 758:1</p> <p><b>comment</b> [6] - 673:19, 781:11, 784:22, 785:5, 845:6, 884:13</p> <p><b>comments</b> [1] -</p>	<p>671:18</p> <p><b>Commerce</b> [1] - 669:5</p> <p><b>commercial</b> [16] - 684:4, 693:14, 734:12, 734:18, 765:14, 765:17, 767:23, 780:11, 780:12, 826:17, 826:19, 826:23, 827:8, 844:18, 844:21</p> <p><b>COMMISSION</b> [1] - 667:1</p> <p><b>Commission</b> [7] - 667:4, 670:2, 673:8, 673:10, 675:19, 819:15, 874:4</p> <p><b>Commissions</b> [1] - 869:16</p> <p><b>committed</b> [2] - 751:10, 751:23</p> <p><b>Committee</b> [1] - 869:15</p> <p><b>common</b> [4] - 781:11, 832:16, 861:6, 864:6</p> <p><b>commonly</b> [4] - 861:4, 861:24, 862:10, 864:24</p> <p><b>communicate</b> [3] - 831:20, 837:5, 843:17</p> <p><b>communicated</b> [1] - 875:8</p> <p><b>communicating</b> [2] - 753:15, 835:15</p> <p><b>Communication</b> [2] - 679:22, 749:12</p> <p><b>communication</b> [6] - 747:18, 749:9, 749:10, 753:14, 832:6, 843:3</p> <p><b>communications</b> [9] - 681:11, 771:4, 832:11, 843:5, 843:8, 868:1, 879:8, 880:22, 895:21</p> <p><b>community</b> [1] - 832:24</p> <p><b>companion</b> [1] - 847:3</p> <p><b>Company</b> [6] - 667:5, 667:7, 668:5, 677:11, 678:21, 679:21</p> <p><b>company</b> [22] - 673:11, 673:14, 679:19, 687:19, 716:13, 724:12, 747:21, 775:9, 816:14, 819:18, 826:20, 845:2,</p>	<p>850:10, 851:4, 851:7, 851:9, 851:19, 854:5, 881:2, 887:14, 889:16</p> <p><b>company's</b> [4] - 672:18, 679:10, 847:21, 886:24</p> <p><b>company/</b></p> <p><b>Commission</b> [1] - 819:15</p> <p><b>comparable</b> [1] - 674:16</p> <p><b>compare</b> [4] - 725:15, 785:2, 886:13, 892:16</p> <p><b>compared</b> [1] - 783:14</p> <p><b>comparing</b> [3] - 784:13, 785:11, 794:23</p> <p><b>comparison</b> [1] - 689:17</p> <p><b>compelling</b> [1] - 708:19</p> <p><b>compensate</b> [1] - 861:23</p> <p><b>compile</b> [1] - 886:16</p> <p><b>compiling</b> [1] - 886:11</p> <p><b>complaints</b> [6] - 860:4, 860:12, 863:1, 863:22, 864:3, 864:17</p> <p><b>complete</b> [7] - 723:16, 728:24, 729:1, 729:19, 730:2, 794:22, 880:20</p> <p><b>completed</b> [7] - 727:18, 729:12, 802:2, 813:7, 881:15, 884:15, 886:21</p> <p><b>completely</b> [1] - 731:21</p> <p><b>Completely</b> [2] - 822:12, 835:14</p> <p><b>complex</b> [3] - 702:16, 712:1, 732:20</p> <p><b>complexities</b> [1] - 809:2</p> <p><b>complexity</b> [5] - 683:10, 685:14, 691:19, 790:16, 809:10</p> <p><b>compliance</b> [2] - 879:24, 880:10</p> <p><b>Compliance</b> [1] - 679:20</p> <p><b>complicated</b> [5] - 732:1, 733:15, 784:6, 785:7, 882:6</p>	<p><b>component</b> [6] - 685:2, 822:7, 822:8, 858:15, 862:7, 872:9</p> <p><b>components</b> [9] - 684:21, 686:5, 692:24, 732:16, 825:1, 825:17, 863:17, 868:15, 888:18</p> <p><b>composite</b> [1] - 689:15</p> <p><b>compounding</b> [1] - 817:1</p> <p><b>Comprehensive</b> [1] - 679:10</p> <p><b>compressors</b> [1] - 810:11</p> <p><b>comprised</b> [1] - 720:11</p> <p><b>computer</b> [2] - 682:15, 752:21</p> <p><b>Con</b> [71] - 670:3, 670:11, 670:12, 670:17, 671:8, 672:6, 675:24, 676:6, 676:16, 677:2, 680:19, 688:20, 689:3, 689:12, 689:19, 694:15, 694:17, 696:14, 705:18, 706:4, 711:8, 712:8, 712:17, 715:10, 716:12, 751:24, 752:16, 757:14, 757:21, 767:9, 786:5, 805:2, 808:15, 817:8, 817:14, 818:2, 819:5, 820:16, 830:12, 834:6, 835:7, 838:19, 839:6, 842:20, 843:8, 844:24, 846:7, 846:10, 852:23, 858:13, 865:12, 867:22, 869:6, 869:18, 869:24, 870:2, 870:4, 870:10, 871:17, 871:21, 873:7, 876:14, 876:23, 877:18, 878:15, 879:6, 879:15, 890:21, 895:12, 895:19</p> <p><b>concern</b> [8] - 676:1, 676:3, 722:23, 758:2, 818:14, 831:22, 834:5</p>	<p><b>concerned</b> [9] - 670:19, 707:7, 755:4, 756:19, 757:6, 800:10, 851:9, 888:11, 889:13</p> <p><b>concerns</b> [5] - 744:9, 775:6, 809:12, 842:20, 842:22</p> <p><b>conclude</b> [4] - 762:15, 762:17, 762:18, 762:20</p> <p><b>concluded</b> [3] - 796:11, 797:16, 797:22</p> <p><b>concludes</b> [3] - 868:22, 895:3, 895:4</p> <p><b>concluding</b> [1] - 806:24</p> <p><b>conclusion</b> [3] - 762:10, 784:7, 797:4</p> <p><b>conclusions</b> [1] - 848:4</p> <p><b>concomitant</b> [1] - 855:15</p> <p><b>condemned</b> [1] - 741:19</p> <p><b>condition</b> [6] - 741:3, 780:7, 816:5, 825:24, 848:15, 849:6</p> <p><b>conditioner</b> [1] - 861:13</p> <p><b>conditioners</b> [2] - 810:12, 863:11</p> <p><b>conditioning</b> [6] - 686:19, 833:8, 858:11, 858:12, 858:15, 860:7</p> <p><b>conditions</b> [10] - 720:7, 745:18, 787:24, 810:17, 810:19, 811:6, 812:6, 812:20, 816:11</p> <p><b>condominium</b> [1] - 827:15</p> <p><b>conducted</b> [5] - 717:21, 745:7, 745:8, 751:3, 763:15</p> <p><b>conduit</b> [10] - 684:20, 685:11, 686:1, 717:9, 777:16, 777:23, 778:17, 778:23, 891:4</p> <p><b>conduits</b> [2] - 693:3, 694:12</p> <p><b>conference</b> [19] - 670:6, 670:7, 670:24, 671:14,</p>
---	--	---	---	---

<p>671:19, 672:5, 672:15, 672:20, 755:13, 755:15, 755:18, 769:4, 769:7, 778:10, 846:11, 846:12, 890:9, 896:3 <b>Conference</b> [2] - 667:10, 896:6 <b>conferences</b> [2] - 674:15, 674:22 <b>confidence</b> [1] - 825:22 <b>configuration</b> [3] - 724:20, 733:5, 861:19 <b>conflict</b> [2] - 791:2, 791:5 <b>confluence</b> [2] - 691:22, 839:21 <b>confused</b> [3] - 728:21, 854:16, 888:22 <b>confusing</b> [2] - 760:7, 760:12 <b>confusion</b> [2] - 758:16, 759:7 <b>conjecture</b> [3] - 790:24, 792:12, 800:21 <b>connect</b> [2] - 761:3, 761:19 <b>connected</b> [9] - 682:11, 683:14, 683:18, 683:23, 731:4, 780:9, 782:3, 810:4 <b>connection</b> [4] - 696:1, 696:2, 863:6, 863:7 <b>connections</b> [3] - 696:16, 696:18, 696:20 <b>consequence</b> [2] - 831:1, 831:15 <b>consequences</b> [4] - 711:1, 821:12, 832:18, 837:8 <b>conservative</b> [3] - 764:19, 765:1, 811:11 <b>consider</b> [13] - 723:11, 728:24, 730:8, 730:18, 740:6, 753:3, 788:23, 809:4, 811:22, 827:21, 828:2, 829:17, 850:23 <b>considerable</b> [1] - 816:6 <b>consideration</b> [4] -</p>	<p>710:9, 806:10, 829:12, 830:13 <b>considerations</b> [2] - 707:1, 813:14 <b>considered</b> [11] - 675:6, 713:14, 713:19, 731:1, 787:9, 804:7, 811:9, 826:7, 850:14, 881:6, 893:2 <b>considering</b> [4] - 670:15, 707:20, 722:6, 813:11 <b>consists</b> [2] - 680:2, 717:23 <b>console</b> [1] - 801:9 <b>Consolidated</b> [5] - 667:5, 667:7, 668:5, 677:10, 679:21 <b>constant</b> [1] - 806:5 <b>construction</b> [4] - 687:21, 813:8, 871:11, 872:5 <b>constructor</b> [1] - 794:14 <b>Consumer</b> [5] - 668:16, 668:17, 677:16, 838:2, 849:11 <b>consuming</b> [1] - 761:24 <b>contact</b> [23] - 697:19, 697:21, 697:22, 697:24, 698:14, 698:16, 698:24, 790:20, 791:13, 791:21, 792:2, 792:3, 792:9, 792:10, 792:14, 792:17, 792:24, 793:14, 806:5, 806:19, 822:7, 827:12, 845:11 <b>Contact</b> [1] - 790:13 <b>contacted</b> [3] - 793:3, 793:5, 806:11 <b>contacts</b> [12] - 697:10, 697:19, 790:21, 792:1, 792:3, 792:7, 792:13, 792:16, 793:11, 793:14, 797:7, 845:10 <b>context</b> [1] - 819:19 <b>contingencies</b> [16] - 681:5, 693:10, 720:3, 735:11, 735:12, 735:23, 736:3, 737:12, 738:15, 771:9, 772:11, 799:12,</p>	<p>800:2, 829:20, 833:16, 876:9 <b>contingency</b> [48] - 688:4, 703:1, 703:4, 704:13, 706:16, 708:6, 708:7, 708:9, 709:10, 709:12, 709:21, 709:23, 718:24, 721:8, 721:12, 721:15, 721:16, 722:19, 723:10, 724:19, 727:3, 732:13, 733:11, 733:13, 733:15, 733:24, 734:4, 734:7, 735:15, 736:16, 769:24, 780:17, 789:12, 816:20, 824:2, 828:14, 829:13, 829:15, 831:24, 837:7, 838:20, 839:2, 839:8, 840:21, 857:24, 868:12, 868:13 <b>contingent</b> [1] - 684:13 <b>continually</b> [1] - 753:15 <b>continue</b> [6] - 686:4, 713:22, 714:1, 728:13, 743:20, 841:18 <b>continued</b> [5] - 721:16, 729:16, 733:11, 735:7, 821:5 <b>continues</b> [4] - 688:7, 723:13, 729:16, 857:2 <b>continuing</b> [1] - 748:11 <b>continuous</b> [1] - 711:13 <b>continuously</b> [1] - 753:17 <b>contracted</b> [1] - 775:9 <b>contractor</b> [2] - 716:16, 747:23 <b>contractors</b> [4] - 716:16, 817:17, 818:21, 827:7 <b>Contrast</b> [1] - 688:20 <b>contrast</b> [1] - 682:17 <b>contribute</b> [2] - 816:12, 816:14 <b>contribution</b> [2] - 783:13, 819:20 <b>control</b> [20] - 698:3, 713:6, 716:11,</p>	<p>719:6, 719:16, 720:14, 721:5, 724:17, 747:13, 758:4, 801:8, 805:15, 805:17, 807:12, 815:2, 834:7, 841:22, 841:23, 859:3, 859:9 <b>controlled</b> [2] - 859:3, 867:7 <b>controller</b> [2] - 680:8, 870:4 <b>converge</b> [9] - 733:18, 733:22, 733:23, 734:1, 734:5, 734:6, 735:1, 735:20, 736:16 <b>converging</b> [1] - 735:11 <b>conversation</b> [8] - 723:8, 723:9, 723:24, 756:8, 843:13, 845:13, 845:21, 848:8 <b>conversations</b> [8] - 719:9, 719:12, 721:20, 722:3, 724:13, 842:17, 845:6, 845:17 <b>converted</b> [1] - 695:16 <b>converter</b> [2] - 807:24, 808:18 <b>cool</b> [3] - 745:11, 745:22, 816:21 <b>cooling</b> [2] - 788:15, 838:21 <b>cope</b> [1] - 800:17 <b>copy</b> [3] - 679:12, 679:14, 679:23 <b>corner</b> [1] - 690:3 <b>Corp</b> [1] - 668:20 <b>corporate</b> [3] - 755:11, 755:17, 757:19 <b>corporately</b> [1] - 743:10 <b>Corporation</b> [1] - 677:24 <b>Corporations</b> [1] - 869:15 <b>correct</b> [19] - 718:14, 733:3, 733:18, 735:19, 744:13, 755:1, 755:3, 759:15, 766:18, 768:13, 789:19, 794:18, 810:22, 813:10, 814:19, 823:7, 852:2, 893:15, 894:16 <b>Correct</b> [8] - 744:14,</p>	<p>761:18, 782:7, 811:19, 812:1, 891:18, 892:1, 892:3 <b>corrected</b> [2] - 735:9 <b>corrective</b> [1] - 837:20 <b>correctly</b> [7] - 698:7, 698:16, 736:4, 791:18, 794:8, 801:6, 873:17 <b>correlate</b> [1] - 886:18 <b>correlated</b> [1] - 766:5 <b>correlation</b> [1] - 886:15 <b>corrosion</b> [7] - 742:9, 742:14, 742:19, 743:1, 743:4, 743:13 <b>cost</b> [18] - 751:21, 754:13, 754:19, 835:19, 836:2, 836:3, 836:14, 881:20, 881:21, 883:4, 883:6, 883:9, 884:18, 884:24, 885:9, 888:3, 888:4, 889:5 <b>costs</b> [6] - 754:23, 885:3, 886:20, 889:7, 889:10, 894:4 <b>Couch</b> [2] - 668:23, 677:22 <b>Counsel</b> [3] - 668:2, 668:13, 779:8 <b>counsel</b> [3] - 717:19, 779:9, 879:14 <b>counsels</b> [1] - 670:8 <b>count</b> [13] - 752:3, 755:20, 756:13, 758:3, 822:18, 822:20, 823:8, 823:9, 827:18, 833:11, 834:8, 834:16, 851:5 <b>counted</b> [2] - 823:5, 833:3 <b>counting</b> [1] - 823:11 <b>country</b> [2] - 682:19, 711:20 <b>counts</b> [1] - 848:9 <b>county</b> [2] - 686:23, 689:23 <b>County</b> [1] - 752:15 <b>couple</b> [23] - 718:2, 727:14, 731:6, 744:7, 748:3, 748:9, 750:3, 750:15, 751:12, 751:22, 795:5, 795:9, 809:4, 817:8, 817:12, 826:24, 838:5, 838:7, 839:10,</p>
--	---	---	---	--

<p>866:22, 883:22, 884:21, 893:17 <b>course</b> [8] - 672:24, 699:19, 700:11, 701:2, 721:21, 747:15, 773:5, 877:15 <b>cover</b> [2] - 680:23, 890:15 <b>covered</b> [2] - 849:14, 894:18 <b>covering</b> [1] - 883:15 <b>covers</b> [3] - 694:1, 873:4, 890:21 <b>CPB</b>..... <b>849</b> [1] - 897:7 <b>create</b> [2] - 675:20, 770:6 <b>created</b> [1] - 852:9 <b>creating</b> [1] - 747:3 <b>creation</b> [1] - 814:4 <b>Creek</b> [2] - 690:4, 726:15 <b>crew</b> [2] - 746:3, 746:15 <b>crews</b> [13] - 716:6, 716:9, 716:13, 716:15, 716:16, 770:21, 771:2, 771:5, 882:5, 884:1 <b>crisis</b> [1] - 836:24 <b>crisscrossed</b> [1] - 692:20 <b>criteria</b> [14] - 706:22, 719:15, 720:2, 720:3, 782:15, 782:24, 811:9, 811:12, 811:13, 813:17, 814:5, 824:7, 830:16, 857:23 <b>cross</b> [2] - 671:20, 676:8 <b>cross-examination</b> [2] - 671:20, 676:8 <b>crux</b> [1] - 759:19 <b>CSR</b> [1] - 759:24 <b>CT</b> [2] - 796:10, 797:22 <b>culminate</b> [1] - 673:9 <b>cumbersome</b> [1] - 884:23 <b>cumulative</b> [2] - 720:22, 873:12 <b>curious</b> [2] - 867:24, 892:14 <b>current</b> [46] - 697:17, 698:20, 700:8, 700:9, 700:21, 700:24, 721:22,</p>	<p>771:8, 771:11, 771:14, 772:4, 773:14, 773:23, 774:7, 774:12, 774:20, 776:8, 783:21, 784:12, 785:1, 786:16, 787:17, 796:22, 797:6, 797:9, 797:11, 797:16, 797:22, 798:14, 798:16, 810:5, 820:19, 855:10, 855:12, 855:14, 855:16, 855:17, 856:5, 856:7, 856:10, 864:11, 864:20, 864:22, 865:3 <b>currents</b> [5] - 783:14, 785:12, 803:13, 855:19, 856:16 <b>curve</b> [6] - 734:8, 734:11, 734:16, 734:23, 736:1, 736:2 <b>curved</b> [1] - 792:7 <b>curves</b> [1] - 734:24 <b>cushion</b> [1] - 820:9 <b>customer</b> [85] - 680:14, 681:7, 681:11, 688:10, 688:17, 688:18, 689:3, 706:4, 710:3, 711:5, 711:14, 712:1, 712:3, 712:8, 712:12, 712:17, 712:23, 713:1, 713:2, 714:12, 715:6, 715:13, 717:2, 720:19, 728:9, 728:12, 729:12, 729:14, 730:16, 730:19, 748:13, 751:20, 753:16, 754:2, 755:20, 756:13, 757:14, 758:3, 759:16, 759:23, 763:22, 764:21, 765:22, 765:23, 769:16, 770:17, 780:13, 780:18, 815:7, 815:14, 816:15, 822:10, 822:12, 822:15, 827:19, 827:21, 828:4, 828:10, 828:13, 828:20, 829:19, 830:5, 831:13, 834:8,</p>	<p>834:16, 835:1, 848:9, 848:11, 849:3, 860:15, 860:20, 861:7, 861:8, 861:21, 862:2, 862:11, 862:24, 863:4, 863:5, 864:5, 864:7, 868:5, 879:7, 880:21, 895:20 <b>customer's</b> [6] - 736:3, 835:7, 848:14, 848:22, 848:23, 861:20 <b>customers</b> [128] - 682:22, 683:1, 683:13, 684:3, 684:16, 685:6, 686:13, 688:14, 688:15, 689:3, 689:6, 689:10, 690:20, 691:4, 691:7, 693:13, 693:14, 695:8, 695:9, 705:20, 706:1, 706:12, 710:8, 710:11, 710:12, 711:9, 712:11, 713:13, 713:20, 713:21, 713:23, 714:1, 714:14, 714:24, 715:15, 716:4, 716:20, 716:21, 716:24, 717:3, 717:4, 719:23, 728:18, 729:4, 729:9, 730:22, 731:3, 731:7, 731:10, 734:7, 734:10, 734:12, 734:18, 734:19, 734:20, 734:21, 754:8, 755:5, 756:5, 759:13, 760:2, 760:4, 760:12, 763:3, 764:4, 764:9, 764:11, 765:2, 765:11, 765:14, 765:18, 765:21, 766:4, 766:14, 766:15, 767:2, 767:6, 767:8, 767:12, 768:9, 768:14, 768:19, 768:24, 769:13, 781:11, 799:22, 804:12, 804:17, 804:20, 807:4, 807:17, 809:19, 809:22, 810:7,</p>	<p>817:1, 818:5, 818:23, 820:15, 821:6, 823:14, 827:15, 827:18, 828:8, 828:12, 830:11, 831:11, 831:12, 832:12, 832:14, 832:15, 833:11, 837:16, 843:3, 843:17, 843:18, 844:18, 851:13, 860:6, 861:14, 861:24, 862:3, 862:9, 868:20, 887:4, 887:7, 887:15 <b>cut</b> [18] - 768:10, 772:2, 772:7, 773:13, 774:14, 775:4, 775:19, 775:21, 776:16, 784:9, 795:16, 795:18, 796:24, 797:1, 798:8, 809:11, 847:19, 891:12 <b>cutaway</b> [2] - 685:18, 694:10 <b>cycle</b> [17] - 688:6, 692:6, 692:7, 693:6, 693:11, 705:6, 725:3, 730:10, 813:22, 839:20, 885:23, 885:24, 886:1, 886:5, 886:6</p>	<p style="text-align: center;"><b>D</b></p> <p><b>damage</b> [25] - 693:2, 707:17, 708:14, 708:17, 720:7, 720:12, 725:14, 725:16, 725:22, 726:3, 726:11, 727:6, 727:7, 727:9, 729:20, 740:4, 771:15, 796:1, 796:3, 798:8, 829:21, 830:18, 837:13, 840:5, 841:8 <b>damaged</b> [9] - 694:7, 707:8, 707:10, 716:22, 717:7, 781:2, 803:23, 804:1 <b>dance</b> [1] - 816:1 <b>danger</b> [1] - 825:2 <b>dashboard</b> [1] - 708:18 <b>data</b> [26] - 687:5, 736:17, 737:16, 737:23, 738:3,</p>	<p>752:10, 752:12, 760:21, 762:1, 762:9, 762:11, 766:5, 773:22, 776:1, 786:6, 788:23, 802:20, 810:23, 821:22, 821:23, 823:21, 835:10, 875:21, 880:14, 886:17 <b>database</b> [1] - 767:4 <b>date</b> [7] - 731:9, 731:12, 731:14, 741:21, 755:2, 892:4, 893:7 <b>dated</b> [2] - 679:12, 679:19 <b>Dave</b> [2] - 715:24, 729:8 <b>David</b> [4] - 668:7, 677:12, 680:10, 717:24 <b>day-to-day</b> [1] - 801:13 <b>days</b> [7] - 728:14, 728:15, 811:2, 814:24, 831:6, 852:19 <b>DC</b> [10] - 697:17, 698:20, 701:10, 701:12, 784:12, 785:1, 785:12, 796:12, 796:16, 796:22 <b>de</b> [1] - 703:15 <b>de-energized</b> [1] - 703:15 <b>dead</b> [1] - 825:13 <b>deal</b> [6] - 739:13, 768:20, 807:20, 826:22, 831:2, 831:4 <b>dealing</b> [2] - 810:3, 821:14 <b>dealt</b> [1] - 894:17 <b>December</b> [6] - 727:19, 728:4, 729:2, 729:24, 730:2, 730:12 <b>decide</b> [2] - 718:3, 885:12 <b>decided</b> [4] - 748:4, 757:6, 819:14, 878:5 <b>deciding</b> [3] - 745:10, 770:6, 813:15 <b>decision</b> [19] - 681:5, 691:5, 707:2, 726:8, 726:10, 726:19, 748:5, 782:20, 831:17, 836:11, 837:6, 840:22,</p>
--	--	--	--	---	--

<p>841:2, 841:13, 842:2, 842:3, 842:10, 842:23 <b>decisions</b> [6] - 702:10, 736:14, 821:12, 840:24, 841:14, 850:1 <b>decline</b> [1] - 709:4 <b>declining</b> [3] - 707:24, 708:22, 830:20 <b>decrease</b> [2] - 800:12, 856:9 <b>dedicated</b> [1] - 730:1 <b>deduced</b> [1] - 796:9 <b>deenergized</b> [1] - 739:19 <b>defect</b> [1] - 861:19 <b>defective</b> [1] - 825:6 <b>defend</b> [2] - 673:14, 829:3 <b>defer</b> [1] - 889:8 <b>deferring</b> [1] - 894:4 <b>define</b> [2] - 727:6, 822:11 <b>defined</b> [1] - 727:9 <b>definite</b> [1] - 831:15 <b>Definitely</b> [2] - 789:3, 804:8 <b>definitely</b> [8] - 744:24, 784:8, 786:19, 798:15, 812:17, 816:19, 817:2, 829:16 <b>definition</b> [3] - 729:4, 730:16, 831:13 <b>definitive</b> [1] - 849:24 <b>degree</b> [5] - 825:18, 825:21, 842:21, 850:19, 858:16 <b>degrees</b> [5] - 810:21, 811:1, 811:4, 812:8, 812:21 <b>Delaney</b> [2] - 668:20, 677:23 <b>delay</b> [2] - 740:14 <b>delayed</b> [1] - 741:2 <b>delays</b> [1] - 739:16 <b>delegate</b> [1] - 842:5 <b>deliberate</b> [1] - 859:7 <b>deliberately</b> [1] - 705:24 <b>delivered</b> [1] - 741:22 <b>delivers</b> [1] - 849:9 <b>delivery</b> [1] - 705:24 <b>deload</b> [2] - 716:21, 843:12 <b>delve</b> [1] - 691:1 <b>demand</b> [5] - 686:17, 687:14, 704:22, 705:8, 705:18,</p>	<p>705:19, 705:21, 707:22, 707:23, 765:15, 767:13, 799:20, 799:21, 813:19, 816:15, 817:4, 817:8, 817:10, 817:23, 818:17, 819:16, 819:21, 820:14, 820:18, 826:7, 826:18, 827:20, 829:14, 830:19, 857:10, 857:11, 857:15, 857:19, 858:18, 859:8, 860:13, 864:2, 864:7, 864:20, 864:23, 864:24, 868:14, 868:17, 871:3, 871:11, 872:4, 872:19, 879:23, 890:10 <b>demands</b> [3] - 767:12, 856:15, 863:11 <b>demonstrate</b> [2] - 790:16, 790:17 <b>demonstrated</b> [1] - 736:19 <b>density</b> [2] - 688:24, 754:8 <b>DEP</b> [1] - 807:11 <b>Department</b> [5] - 668:2, 668:3, 672:4, 677:18, 706:6 <b>department</b> [4] - 677:2, 680:11, 719:22, 758:6 <b>departments</b> [1] - 758:9 <b>depiction</b> [1] - 814:23 <b>depicts</b> [1] - 694:13 <b>deployed</b> [1] - 716:18 <b>deployment</b> [1] - 754:6 <b>derive</b> [1] - 865:4 <b>Desanti</b> [15] - 680:10, 715:24, 717:24, 729:8, 741:17, 742:20, 743:1, 743:12, 778:5, 782:6, 852:24, 853:12, 853:17, 853:21, 854:6 <b>DESANTI</b> [4] - 716:1, 731:14, 731:18, 798:23 <b>describe</b> [4] - 693:17, 792:21, 804:15, 804:21 <b>described</b> [7] -</p>	<p>691:17, 816:13, 822:15, 831:5, 836:7, 847:19, 890:13 <b>describes</b> [1] - 693:16 <b>description</b> [2] - 801:4, 873:13 <b>design</b> [35] - 684:8, 684:13, 685:9, 687:17, 687:20, 688:4, 695:1, 695:3, 698:15, 706:21, 718:12, 729:20, 738:14, 782:24, 790:17, 792:15, 793:23, 794:13, 799:12, 804:5, 811:9, 811:12, 812:7, 824:7, 824:10, 824:13, 852:5, 852:7, 857:14, 857:23, 865:2 <b>designed</b> [14] - 674:22, 684:10, 698:5, 698:16, 698:22, 702:3, 703:2, 733:17, 738:22, 739:2, 739:5, 753:21, 824:6, 856:20 <b>designer</b> [1] - 790:23 <b>desired</b> [2] - 802:9, 803:7 <b>despite</b> [3] - 691:9, 748:15, 817:3 <b>destructive</b> [1] - 796:19 <b>detail</b> [6] - 691:1, 693:17, 700:14, 854:21, 863:3, 879:12 <b>details</b> [2] - 764:23, 776:20 <b>detect</b> [2] - 773:19, 774:12 <b>detection</b> [3] - 712:3, 712:4, 774:21 <b>determination</b> [1] - 850:11 <b>determinations</b> [1] - 768:17 <b>determine</b> [8] - 732:6, 737:6, 737:9, 737:23, 743:22, 775:18, 802:8, 805:21 <b>determined</b> [2] - 718:9, 722:11 <b>determining</b> [2] -</p>	<p>764:14, 783:13 <b>develop</b> [3] - 747:18, 748:4, 874:2 <b>developed</b> [5] - 700:18, 747:5, 784:2, 794:8, 829:18 <b>developing</b> [5] - 748:7, 770:3, 782:13, 842:9, 874:19 <b>Development</b> [2] - 668:20, 677:24 <b>development</b> [2] - 813:12, 871:12 <b>device</b> [8] - 738:24, 746:17, 773:24, 774:5, 774:8, 788:11, 800:22, 801:12 <b>devices</b> [8] - 704:2, 744:6, 776:5, 783:9, 783:18, 798:3, 798:4 <b>DGOA</b> [1] - 742:4 <b>diagnostic</b> [6] - 825:5, 825:9, 825:15, 825:16, 825:17, 825:19 <b>diagram</b> [9] - 681:13, 690:15, 691:18, 699:4, 706:24, 730:10, 794:7, 794:8 <b>diagrams</b> [2] - 794:24 <b>dialog</b> [2] - 672:18, 846:2 <b>dialogs</b> [1] - 845:12 <b>dialogue</b> [2] - 846:9, 847:18 <b>dies</b> [1] - 753:22 <b>difference</b> [6] - 701:12, 738:10, 738:11, 765:19, 781:13, 818:19 <b>different</b> [22] - 674:17, 692:2, 732:5, 734:10, 740:20, 742:22, 743:10, 777:14, 781:20, 785:21, 793:15, 797:23, 802:23, 812:14, 817:6, 817:12, 827:18, 858:7, 874:21, 888:17, 890:22 <b>differently</b> [1] - 737:13 <b>difficult</b> [2] - 826:16, 895:9 <b>difficulties</b> [3] - 742:15, 783:12, 809:24 <b>diligence</b> [1] - 831:22</p>	<p><b>dim</b> [1] - 860:23 <b>diminished</b> [1] - 748:16 <b>direct</b> [9] - 707:4, 707:19, 712:7, 720:14, 758:5, 823:14, 845:6, 845:21, 867:12 <b>directed</b> [2] - 674:10, 787:12 <b>direction</b> [3] - 739:4, 739:5, 840:12 <b>directions</b> [2] - 683:24, 862:9 <b>directly</b> [5] - 706:4, 768:20, 830:5, 845:17, 863:4 <b>director</b> [2] - 680:13, 869:6 <b>disappointed</b> [2] - 833:6, 837:9 <b>disappointment</b> [1] - 837:18 <b>disaster</b> [2] - 821:9, 831:5 <b>disconnect</b> [4] - 767:20, 780:5, 781:2, 781:8 <b>disconnected</b> [3] - 766:15, 767:3, 781:18 <b>discontinued</b> [1] - 749:11 <b>discourse</b> [1] - 675:14 <b>discovered</b> [2] - 733:4, 791:6 <b>discovery</b> [2] - 798:18, 867:20 <b>discrete</b> [1] - 691:21 <b>Discrete</b> [1] - 693:5 <b>discuss</b> [2] - 841:10, 846:13 <b>discussed</b> [5] - 780:24, 789:12, 840:22, 856:2, 859:11 <b>discussing</b> [1] - 826:8 <b>discussion</b> [12] - 724:16, 739:17, 771:8, 790:3, 806:10, 816:6, 821:11, 822:16, 841:23, 842:13, 868:23, 892:21 <b>Discussion</b> [4] - 765:8, 789:8, 879:4, 895:6 <b>discussions</b> [12] - 718:23, 719:24, 720:2, 724:14,</p>
--	--	---	---	---

<p>841:21, 842:19, 843:1, 843:16, 843:22, 843:23, 844:3, 844:8 <b>disparity</b> [1] - 834:6 <b>dispatch</b> [1] - 836:10 <b>dispatched</b> [2] - 713:7, 771:2 <b>display</b> [3] - 717:1, 719:18, 795:18 <b>disseminate</b> [1] - 875:6 <b>disseminated</b> [1] - 713:8 <b>dissolved</b> [1] - 742:5 <b>dissuade</b> [1] - 713:20 <b>distance</b> [3] - 674:21, 699:10, 702:1 <b>distances</b> [1] - 865:19 <b>distinction</b> [1] - 752:9 <b>distinguishing</b> [1] - 684:7 <b>distribute</b> [1] - 683:12 <b>distributed</b> [5] - 695:18, 847:11, 862:14, 862:15, 863:15 <b>distribution</b> [35] - 680:22, 682:20, 684:15, 684:24, 690:22, 690:23, 711:14, 711:21, 716:3, 719:4, 719:8, 722:4, 722:7, 725:4, 725:5, 737:6, 739:7, 745:4, 745:15, 757:17, 757:23, 801:24, 802:21, 803:2, 806:18, 817:24, 841:21, 862:8, 864:4, 870:11, 872:7, 879:16, 889:24, 890:4, 890:11 <b>divide</b> [3] - 714:19, 756:18, 777:13 <b>divided</b> [1] - 714:20 <b>Division</b> [1] - 668:14 <b>documentation</b> [2] - 843:2, 854:22 <b>documents</b> [2] - 840:21, 841:2 <b>dog</b> [2] - 833:9, 833:10 <b>dollar</b> [2] - 873:8, 873:12 <b>dollars</b> [9] - 836:4, 871:15, 880:4, 883:4, 888:13, 888:24, 894:11,</p>	<p>894:14, 894:23 <b>Donaldson</b> [4] - 668:10, 678:12, 838:6, 846:16 <b>DONALDSON</b> [3] - 846:17, 846:19, 849:10 <b>done</b> [45] - 678:7, 685:20, 701:5, 713:16, 724:7, 730:12, 733:21, 743:9, 745:3, 745:4, 756:9, 757:8, 779:8, 791:20, 791:21, 794:7, 794:16, 794:17, 794:19, 802:2, 802:3, 803:7, 803:8, 803:14, 815:18, 819:4, 820:1, 825:17, 825:22, 829:17, 835:13, 839:5, 851:7, 863:20, 877:5, 877:17, 881:10, 882:17, 884:24, 885:5, 885:8, 885:19, 888:3, 892:23 <b>door</b> [3] - 697:13, 827:10 <b>double</b> [2] - 674:6, 871:19 <b>doubtful</b> [1] - 776:13 <b>down</b> [107] - 681:6, 682:2, 682:3, 682:4, 682:12, 682:13, 682:21, 682:22, 683:4, 683:5, 683:20, 683:23, 685:17, 686:9, 686:10, 689:14, 695:17, 705:8, 706:20, 706:22, 707:3, 707:20, 708:19, 709:11, 710:10, 710:23, 710:24, 711:1, 711:7, 711:14, 714:6, 715:21, 716:10, 718:20, 718:21, 719:1, 719:16, 720:4, 721:3, 722:6, 722:8, 723:5, 723:11, 723:14, 724:2, 724:5, 724:8, 724:12, 724:15, 725:8, 726:8, 726:18, 726:19, 728:19, 743:13,</p>	<p>747:1, 748:16, 748:18, 750:14, 752:20, 753:1, 753:8, 753:10, 754:16, 757:9, 758:17, 758:24, 759:1, 763:5, 763:10, 767:7, 801:11, 809:1, 809:6, 830:10, 830:13, 830:14, 831:2, 831:12, 831:15, 841:1, 841:19, 842:20, 842:23, 844:1, 845:2, 846:21, 849:18, 849:21, 850:11, 856:16, 856:23, 859:14, 859:16, 861:18, 867:5, 872:13, 873:11, 876:6, 878:16, 879:21, 882:8, 887:4, 888:18, 892:22 <b>downstream</b> [2] - 711:16, 711:18 <b>dozens</b> [1] - 715:3 <b>draft</b> [1] - 671:15 <b>dramatic</b> [1] - 833:14 <b>drawing</b> [2] - 694:10, 752:9 <b>drawings</b> [1] - 794:14 <b>drawn</b> [1] - 861:18 <b>drill</b> [3] - 874:8, 876:14, 876:17 <b>drilled</b> [2] - 874:11, 875:15 <b>drills</b> [3] - 875:19, 876:19, 877:9 <b>drive</b> [7] - 750:16, 753:1, 756:9, 757:8, 758:24, 759:1, 764:17 <b>driven</b> [3] - 722:21, 755:22, 755:24 <b>driver</b> [1] - 839:19 <b>drivers</b> [1] - 872:24 <b>driving</b> [3] - 753:8, 836:15, 840:15 <b>drop</b> [2] - 782:21, 825:13 <b>dropping</b> [1] - 709:1 <b>drove</b> [4] - 715:2, 756:3, 758:17, 759:8 <b>dry</b> [4] - 811:3, 811:18, 811:20, 811:23 <b>duct</b> [12] - 694:4, 694:5, 694:6, 694:19, 717:9,</p>	<p>777:18, 777:20, 777:24, 778:7, 778:17, 778:21, 778:23 <b>ducts</b> [2] - 694:17, 694:20 <b>due</b> [7] - 670:22, 673:4, 673:11, 701:12, 804:2, 824:21, 856:14 <b>duly</b> [2] - 679:5, 869:9 <b>duration</b> [3] - 707:11, 738:9, 834:2 <b>durations</b> [1] - 737:19 <b>During</b> [6] - 667:7, 803:21, 807:14, 840:20, 846:20, 870:21 <b>during</b> [47] - 672:24, 678:2, 681:3, 689:7, 690:9, 702:10, 704:20, 705:8, 716:19, 722:12, 724:16, 725:13, 732:23, 739:14, 740:13, 741:1, 741:8, 745:12, 761:6, 769:3, 769:15, 769:18, 772:9, 775:5, 784:14, 786:17, 786:20, 787:9, 796:11, 797:1, 803:24, 804:1, 807:8, 814:23, 815:20, 818:4, 819:11, 838:15, 838:20, 841:17, 841:24, 852:19, 858:21, 866:9, 871:6, 871:10, 889:10 <b>duty</b> [1] - 842:8 <b>dynamics</b> [2] - 703:23, 709:22</p>	<p><b>eastern</b> [1] - 710:8 <b>easy</b> [1] - 757:11 <b>Economic</b> [2] - 668:20, 677:24 <b>Ed</b> [15] - 680:7, 694:15, 696:14, 716:12, 757:21, 805:2, 808:16, 838:19, 839:6, 842:20, 844:24, 846:10, 852:23, 870:2, 873:7 <b>Ed's</b> [4] - 694:17, 786:5, 871:22, 878:15 <b>edge</b> [1] - 784:16 <b>Edison</b> [53] - 667:5, 667:6, 668:5, 670:3, 670:11, 670:13, 670:17, 671:8, 675:24, 676:6, 676:16, 677:2, 677:10, 679:21, 680:20, 688:20, 689:3, 689:20, 705:18, 706:4, 711:8, 712:8, 712:17, 715:10, 751:16, 751:24, 752:2, 752:5, 752:16, 757:15, 767:9, 817:8, 817:14, 818:2, 819:5, 820:16, 834:6, 835:7, 835:21, 843:8, 846:7, 858:13, 867:22, 869:6, 869:18, 869:24, 870:4, 870:10, 876:14, 877:18, 879:6, 895:12, 895:19 <b>Edison's</b> [9] - 672:6, 688:21, 689:13, 830:12, 865:12, 871:17, 876:23, 879:15, 890:21 <b>effect</b> [17] - 671:4, 671:7, 709:2, 709:3, 709:5, 727:2, 740:14, 748:2, 799:6, 802:9, 803:5, 803:7, 817:2, 852:12, 868:9, 868:11, 894:8 <b>effective</b> [2] - 693:9, 836:14 <b>effectively</b> [1] - 853:8 <b>effects</b> [2] - 732:12,</p>
			<b>E</b>	
			<p><b>E-mail</b> [1] - 878:22 <b>e-mails</b> [1] - 878:21 <b>E04095</b> [1] - 801:21 <b>early</b> [8] - 734:21, 744:5, 747:15, 764:20, 769:20, 815:6, 852:12, 852:15 <b>easily</b> [1] - 836:9 <b>East</b> [1] - 701:16 <b>east</b> [5] - 690:5, 865:11, 865:12, 867:13</p>	

<p>874:21  <b>efficiency</b> [2] - 817:21, 817:22  <b>effort</b> [7] - 681:9, 716:12, 717:6, 727:16, 770:1, 793:8, 826:13  <b>efforts</b> [6] - 705:11, 706:8, 709:5, 748:16, 750:15, 807:16  <b>egress</b> [1] - 806:1  <b>eight</b> [13] - 683:7, 693:22, 706:1, 728:14, 728:15, 799:15, 800:14, 807:9, 838:24, 850:24, 853:2, 859:13, 859:14  <b>eight-day</b> [1] - 850:24  <b>eighth</b> [3] - 704:12, 719:12, 737:4  <b>either</b> [20] - 713:5, 719:21, 720:13, 720:16, 731:4, 732:17, 755:13, 758:13, 760:18, 814:3, 819:9, 837:15, 848:19, 857:20, 861:7, 865:22, 865:23, 876:19, 877:12, 891:9  <b>EKG</b> [2] - 825:12, 825:13  <b>elaborate</b> [8] - 718:22, 720:8, 721:1, 736:24, 777:4, 780:1, 790:10, 867:24  <b>ELEANOR</b> [1] - 667:15  <b>Eleanor</b> [1] - 676:24  <b>electric</b> [9] - 670:3, 680:6, 680:9, 680:19, 712:14, 813:20, 869:24, 889:24, 890:4  <b>Electric</b> [1] - 667:8  <b>electrical</b> [6] - 686:19, 707:23, 847:2, 847:12, 847:15, 868:4  <b>electrically</b> [1] - 746:11  <b>electricians</b> [1] - 860:24  <b>electricity</b> [5] - 681:15, 684:6, 706:13, 730:24, 831:7</p>	<p><b>electromechanical</b> [2] - 786:1, 786:12  <b>element</b> [1] - 705:11  <b>Ell</b> [1] - 725:7  <b>elicit</b> [1] - 674:22  <b>elimination</b> [1] - 871:8  <b>Ellen</b> [3] - 668:13, 678:12, 838:4  <b>elsewhere</b> [3] - 716:9, 754:9, 821:17  <b>emergencies</b> [1] - 836:23  <b>Emergencies</b> [1] - 667:5  <b>emergency</b> [24] - 712:16, 726:24, 730:20, 744:12, 744:13, 755:11, 755:17, 757:19, 805:14, 805:17, 805:18, 806:1, 841:22, 845:14, 846:4, 846:8, 873:7, 874:7, 874:11, 876:10, 876:14, 876:22, 877:3, 877:16  <b>Empire</b> [2] - 668:3, 668:18  <b>employ</b> [1] - 836:11  <b>employed</b> [1] - 785:22  <b>employee</b> [1] - 720:13  <b>employees</b> [1] - 719:22  <b>empowered</b> [1] - 842:10  <b>EMTP</b> [2] - 785:10, 803:18  <b>en</b> [1] - 726:5  <b>encourage</b> [2] - 671:1, 713:24  <b>encouraging</b> [1] - 675:13  <b>end</b> [17] - 675:6, 699:12, 702:22, 778:10, 778:14, 781:2, 782:2, 815:22, 820:10, 821:14, 837:14, 842:12, 861:12, 880:12, 888:8, 888:9, 893:9  <b>ending</b> [1] - 887:10  <b>energize</b> [1] - 781:3  <b>energized</b> [3] - 703:15, 781:13, 797:17  <b>energy</b> [14] - 680:12, 681:21, 700:7, 707:10, 711:24,</p>	<p>716:18, 753:12, 771:21, 781:22, 786:23, 788:6, 801:8, 839:24, 840:12  <b>Energy</b> [1] - 677:13  <b>engaged</b> [1] - 788:15  <b>engine</b> [2] - 732:9, 735:3  <b>Engineering</b> [2] - 748:10, 852:4  <b>engineering</b> [15] - 680:7, 721:21, 722:8, 724:18, 725:12, 743:21, 744:18, 782:23, 801:24, 802:21, 803:2, 815:8, 870:2, 881:18, 886:20  <b>engineers</b> [9] - 671:3, 687:19, 701:11, 732:24, 796:23, 802:13, 802:21, 815:15, 837:17  <b>Engineers</b> [1] - 747:22  <b>engines</b> [1] - 836:22  <b>English</b> [1] - 712:19  <b>enhancements</b> [1] - 750:12  <b>enlarging</b> [1] - 717:10  <b>enter</b> [7] - 674:21, 679:7, 679:10, 687:17, 808:5, 875:16, 877:11  <b>entering</b> [1] - 735:6  <b>entire</b> [10] - 684:19, 689:15, 694:1, 757:23, 807:1, 825:10, 834:1, 841:17, 852:13, 878:15  <b>entirely</b> [1] - 700:4  <b>entities</b> [2] - 757:14, 842:18  <b>entitled</b> [2] - 679:20, 680:2  <b>environmental</b> [3] - 820:3, 879:24, 880:10  <b>Environmental</b> [1] - 668:11  <b>EO-4095</b> [1] - 850:5  <b>EPA</b> [1] - 879:24  <b>epoxy</b> [1] - 743:3  <b>equal</b> [1] - 850:15  <b>equally</b> [1] - 847:11  <b>equated</b> [1] - 891:8  <b>equation</b> [1] - 707:14  <b>equipment</b> [3] - 682:14, 700:17,</p>	<p>703:11, 721:6, 721:13, 721:15, 722:5, 722:9, 723:21, 723:22, 723:23, 724:15, 725:2, 745:19, 745:21, 746:1, 746:4, 746:10, 747:17, 748:4, 750:6, 753:1, 782:19, 782:21, 784:1, 800:4, 815:14  <b>equipped</b> [1] - 877:11  <b>equivalent</b> [2] - 818:14, 818:23  <b>error</b> [3] - 790:18, 791:4, 794:12  <b>ES</b> [1] - 799:8  <b>escalate</b> [1] - 723:13  <b>escalated</b> [2] - 721:15, 766:6  <b>escalation</b> [2] - 766:10, 766:11  <b>especially</b> [4] - 670:20, 692:10, 700:18, 780:11  <b>Esq</b> [7] - 668:10, 668:17, 668:20, 668:22, 668:23, 669:1, 669:6  <b>essentially</b> [25] - 702:13, 706:15, 724:6, 726:5, 726:16, 727:11, 727:13, 732:11, 732:14, 734:16, 740:5, 748:5, 748:21, 749:16, 767:3, 781:8, 801:8, 820:6, 824:7, 843:11, 845:15, 856:12, 860:9, 872:16, 889:18  <b>establish</b> [1] - 875:13  <b>established</b> [2] - 852:11, 875:23  <b>establishment</b> [1] - 684:4  <b>estimate</b> [14] - 690:17, 705:3, 715:6, 760:1, 764:20, 765:1, 778:6, 828:19, 828:21, 828:22, 829:21, 858:11, 858:15, 887:18  <b>estimated</b> [10] - 721:6, 721:13, 725:1, 765:16, 775:13, 822:10, 828:24, 858:17, 883:4, 883:9</p>	<p><b>estimates</b> [5] - 768:12, 823:18, 823:20, 835:9, 835:10  <b>estimating</b> [5] - 715:1, 766:1, 885:12, 888:7, 888:9  <b>etc</b> [1] - 694:17  <b>evaluate</b> [4] - 881:22, 885:15, 885:17, 886:20  <b>evaluated</b> [1] - 724:9  <b>evaluating</b> [2] - 850:10, 885:2  <b>evaluation</b> [4] - 722:13, 722:14, 724:7, 806:22  <b>evaluations</b> [1] - 841:16  <b>evening</b> [31] - 702:13, 703:5, 704:10, 705:23, 707:24, 708:5, 708:8, 708:24, 714:23, 719:11, 719:13, 720:1, 721:7, 721:9, 721:11, 724:19, 731:2, 734:20, 734:21, 766:10, 766:12, 807:1, 833:21, 834:18, 839:6, 839:9, 840:20, 841:14, 859:7, 880:15, 896:4  <b>Event</b> [1] - 679:21  <b>event</b> [80] - 681:3, 681:24, 682:8, 690:10, 691:17, 691:19, 694:3, 694:22, 695:11, 695:12, 699:18, 701:14, 703:3, 703:4, 710:13, 714:18, 720:16, 722:21, 724:1, 724:3, 726:10, 729:6, 729:10, 734:8, 735:8, 739:15, 740:3, 741:8, 741:24, 742:1, 742:23, 759:14, 762:12, 764:5, 764:7, 764:14, 764:15, 769:16, 769:17, 769:18, 772:10, 774:4, 777:10, 779:22, 784:14, 786:17, 786:18, 786:20, 786:21, 787:9, 789:12,</p>
--	--	---	--	--

<p>804:2, 807:8, 807:14, 811:10, 811:12, 815:20, 816:19, 819:11, 821:5, 821:8, 825:3, 832:18, 834:2, 834:24, 839:3, 840:16, 840:17, 852:20, 852:19, 852:20, 857:4, 862:23, 875:24, 892:4, 892:12, 893:2, 893:6</p> <p><b>events</b> [48] - 673:1, 680:22, 681:2, 684:24, 689:11, 691:3, 691:14, 691:22, 691:24, 692:1, 692:4, 692:5, 693:5, 702:5, 709:18, 719:19, 720:18, 720:21, 720:24, 721:14, 721:19, 721:21, 722:22, 723:15, 725:1, 725:13, 746:6, 749:2, 762:7, 769:17, 769:21, 770:20, 775:12, 776:18, 816:7, 816:12, 816:24, 819:20, 839:4, 839:21, 839:23, 858:21, 873:21, 875:17, 876:20, 877:13</p> <p><b>everyday</b> [1] - 730:23</p> <p><b>everywhere</b> [2] - 692:21, 849:5</p> <p><b>evidence</b> [7] - 675:12, 676:5, 678:24, 679:8, 679:10, 795:18, 796:10</p> <p><b>evident</b> [1] - 711:24</p> <p><b>evidentiary</b> [3] - 670:22, 671:19, 675:1</p> <p><b>evolved</b> [2] - 721:11, 723:15</p> <p><b>exact</b> [7] - 755:16, 765:12, 766:13, 860:2, 862:22, 871:15, 883:6</p> <p><b>exactly</b> [8] - 695:21, 736:11, 757:10, 760:24, 768:10, 772:5, 788:12, 794:10</p> <p><b>Exactly</b> [2] - 718:17, 812:10</p>	<p><b>EXAMINATION</b> [12] - 718:1, 779:16, 785:17, 820:24, 826:1, 838:3, 846:19, 849:15, 855:6, 867:18, 870:8, 881:1</p> <p><b>examination</b> [2] - 671:20, 676:8</p> <p><b>Examination</b> [2] - 897:2, 897:13</p> <p><b>examine</b> [1] - 776:16</p> <p><b>examined</b> [1] - 697:9</p> <p><b>examining</b> [1] - 751:9</p> <p><b>example</b> [12] - 675:16, 707:24, 757:15, 768:9, 778:20, 798:7, 819:23, 824:23, 828:3, 838:24, 847:8, 865:5</p> <p><b>examples</b> [2] - 798:7, 872:22</p> <p><b>excavation</b> [1] - 716:16</p> <p><b>exceed</b> [3] - 737:10, 775:14, 856:21</p> <p><b>exceeded</b> [4] - 718:10, 718:11, 817:4, 851:17</p> <p><b>exceeds</b> [1] - 814:1</p> <p><b>exception</b> [1] - 684:10</p> <p><b>exchange</b> [2] - 671:2, 728:22</p> <p><b>excludes</b> [1] - 887:17</p> <p><b>Exclusive</b> [1] - 887:16</p> <p><b>exercise</b> [1] - 675:7</p> <p><b>Exhibit</b> [2] - 679:16, 679:17</p> <p><b>exhibit</b> [2] - 679:19, 680:1</p> <p><b>Exhibits</b> [1] - 680:4</p> <p><b>exist</b> [6] - 747:5, 795:1, 809:2, 824:4, 824:8, 826:18</p> <p><b>existed</b> [3] - 695:20, 744:10, 782:3</p> <p><b>existing</b> [2] - 806:17, 874:24</p> <p><b>exit</b> [1] - 748:5</p> <p><b>expand</b> [1] - 809:1</p> <p><b>expansion</b> [1] - 738:4</p> <p><b>expansive</b> [2] - 692:19, 693:24</p> <p><b>expect</b> [8] - 742:18, 788:24, 812:24, 885:19, 888:12, 889:15, 894:19, 894:20</p> <p><b>expectation</b> [1] - 721:9</p>	<p><b>expected</b> [4] - 697:2, 721:7, 746:21, 783:1</p> <p><b>expecting</b> [1] - 727:18</p> <p><b>expended</b> [1] - 877:18</p> <p><b>expenditure</b> [1] - 871:1</p> <p><b>expenditures</b> [6] - 870:13, 876:23, 878:14, 886:16, 886:19, 889:24</p> <p><b>expense</b> [1] - 887:6</p> <p><b>experience</b> [16] - 687:4, 687:8, 687:12, 689:7, 689:11, 735:22, 736:17, 821:10, 825:16, 831:19, 858:24, 860:16, 863:12, 863:14, 864:7, 864:16</p> <p><b>experienced</b> [17] - 700:1, 700:2, 700:3, 700:4, 734:1, 734:2, 734:3, 740:11, 740:12, 769:24, 771:24, 801:18, 812:22, 821:8, 857:4, 875:18</p> <p><b>experiences</b> [6] - 688:17, 688:19, 689:4, 735:16, 742:10, 771:17</p> <p><b>experiencing</b> [4] - 726:11, 806:8, 832:24, 862:4</p> <p><b>expert</b> [4] - 670:15, 678:1, 678:9, 679:4</p> <p><b>experts</b> [14] - 670:9, 670:18, 671:9, 671:10, 671:23, 672:14, 673:20, 673:23, 675:10, 675:15, 679:5, 766:19, 766:22, 798:19</p> <p><b>experts'</b> [1] - 671:2</p> <p><b>expired</b> [3] - 748:20, 854:8, 854:9</p> <p><b>explain</b> [11] - 692:7, 695:24, 711:10, 718:5, 732:10, 738:13, 745:13, 771:13, 775:22, 790:11, 792:1</p> <p><b>Explain</b> [1] - 697:11</p> <p><b>explained</b> [1] - 772:10</p> <p><b>explanation</b> [7] - 731:24, 732:18, 740:17, 791:10, 833:1, 847:22,</p>	<p>852:17</p> <p><b>explosion</b> [1] - 720:17</p> <p><b>exposed</b> [2] - 796:20, 877:12</p> <p><b>exposure</b> [1] - 814:17</p> <p><b>express</b> [2] - 790:13, 841:11</p> <p><b>extended</b> [1] - 737:19</p> <p><b>extends</b> [2] - 808:13</p> <p><b>extension</b> [1] - 832:17</p> <p><b>extensive</b> [4] - 726:3, 770:15, 877:6, 884:17</p> <p><b>extensively</b> [2] - 775:17, 850:22</p> <p><b>extent</b> [5] - 747:8, 760:5, 816:10, 859:23, 879:12</p> <p><b>Extraordinary</b> [2] - 839:4, 893:3</p> <p><b>extraordinary</b> [2] - 691:3, 893:16</p> <p><b>extreme</b> [1] - 840:16</p> <p><b>extremely</b> [4] - 692:4, 697:23, 735:12, 839:21</p> <p style="text-align: center;"><b>F</b></p> <p><b>FAA</b> [2] - 805:14, 805:20</p> <p><b>face</b> [1] - 875:9</p> <p><b>facilities</b> [10] - 694:15, 694:16, 694:17, 767:9, 805:16, 805:20, 808:7, 813:15, 871:14</p> <p><b>facility</b> [2] - 800:5, 807:10</p> <p><b>fact</b> [24] - 682:19, 685:10, 691:22, 697:9, 699:7, 700:16, 733:22, 737:17, 756:16, 758:17, 759:3, 768:17, 775:12, 775:15, 787:2, 787:12, 796:5, 796:7, 797:15, 798:2, 809:5, 809:15, 817:3, 848:17</p> <p><b>factor</b> [13] - 707:19, 746:2, 776:17, 803:13, 812:5, 850:15, 850:17, 853:16, 853:17, 855:11, 858:23, 858:24, 872:10</p> <p><b>factors</b> [14] - 708:20,</p>	<p>765:20, 830:23, 839:18, 840:15, 840:23, 850:9, 850:13, 853:18, 853:19, 853:21, 856:1, 863:12, 863:17</p> <p><b>factual</b> [1] - 835:10</p> <p><b>faeder</b> [1] - 724:23</p> <p><b>fail</b> [9] - 692:9, 692:10, 780:18, 824:19, 839:13, 839:15, 839:17, 840:6, 862:1</p> <p><b>failed</b> [20] - 692:23, 742:1, 742:3, 742:4, 742:8, 780:6, 789:11, 789:13, 791:12, 791:19, 795:21, 795:23, 795:24, 809:13, 824:17, 832:13, 834:1, 862:9, 890:24, 891:6</p> <p><b>falling</b> [2] - 704:2, 742:13</p> <p><b>fails</b> [1] - 693:1</p> <p><b>failure</b> [13] - 743:16, 795:22, 796:21, 809:16, 814:17, 824:21, 824:24, 825:1, 825:8, 836:12, 855:8, 855:12, 872:17</p> <p><b>failures</b> [7] - 737:20, 796:21, 825:16, 847:21, 891:9, 891:10, 891:11</p> <p><b>fair</b> [6] - 741:16, 750:18, 751:1, 766:8, 839:2, 883:21</p> <p><b>fairly</b> [9] - 732:21, 737:23, 767:12, 770:1, 794:16, 839:3, 863:18, 865:20, 884:23</p> <p><b>fall</b> [1] - 776:15</p> <p><b>false</b> [1] - 809:14</p> <p><b>familiar</b> [8] - 751:7, 754:7, 763:13, 763:18, 763:21, 773:20, 863:12, 890:14</p> <p><b>family</b> [2] - 822:19, 829:6</p> <p><b>far</b> [12] - 673:12, 769:10, 795:1, 795:2, 807:21, 817:4, 851:8, 851:17, 863:2, 883:23, 888:11,</p>
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<p>889:13  <b>fashion</b> [2] - 672:8,  693:24  <b>fast</b> [3] - 833:10,  840:15  <b>faster</b> [1] - 716:22  <b>fatality</b> [1] - 872:13  <b>fault</b> [23] - 772:16,  773:6, 773:7,  773:10, 773:11,  774:8, 774:16,  774:17, 774:20,  774:21, 776:5,  781:1, 783:19,  783:21, 784:11,  785:1, 785:12,  787:17, 791:18,  795:19, 795:24,  796:8, 796:24  <b>faults</b> [11] - 773:5,  773:6, 774:21,  774:24, 775:18,  776:21, 796:3,  796:12, 796:13,  796:20, 798:9  <b>faulty</b> [4] - 695:23,  695:24, 696:1, 822:7  <b>feasible</b> [1] - 836:5  <b>feature</b> [2] - 684:17,  684:18  <b>features</b> [1] - 684:7  <b>fed</b> [1] - 758:13  <b>feed</b> [2] - 758:4, 804:4  <b>feedback</b> [2] - 757:13,  805:23  <b>feeder</b> [111] - 682:20,  685:22, 686:6,  686:7, 692:13,  692:24, 693:1,  695:7, 695:24,  696:17, 696:22,  696:23, 696:24,  700:11, 702:19,  703:9, 703:17,  705:13, 707:5,  708:1, 708:21,  709:6, 709:15,  711:23, 721:19,  722:21, 723:6,  723:17, 723:18,  724:24, 732:17,  737:9, 737:11,  737:15, 739:8,  739:12, 739:15,  739:19, 739:21,  740:15, 741:2,  746:12, 747:12,  770:23, 771:3,  771:6, 771:20,  772:16, 773:1,</p>	<p>773:2, 774:8,  774:17, 774:21,  775:1, 775:15,  780:5, 780:9, 781:1,  781:3, 781:4, 782:1,  782:4, 783:14,  784:3, 786:14,  791:16, 795:22,  795:23, 796:8,  796:15, 796:24,  798:1, 801:23,  802:6, 814:14,  814:17, 830:17,  830:20, 834:24,  838:9, 839:13,  841:6, 846:21,  846:23, 846:24,  847:2, 847:12,  855:8, 855:13,  856:1, 859:22,  860:4, 864:12,  864:13, 864:18,  875:24, 876:4,  882:17, 884:2,  884:7, 884:9,  884:18, 891:10  <b>Feeder</b> [1] - 719:18  <b>Feeders</b> [3] - 692:11,  701:22, 847:11  <b>feeders</b> [160] - 682:5,  682:9, 682:10,  683:6, 683:7,  683:11, 684:11,  684:15, 690:22,  692:9, 692:10,  692:11, 692:14,  692:15, 692:17,  693:4, 693:7,  693:10, 693:12,  693:22, 694:8,  694:9, 694:11,  694:23, 695:1,  695:3, 695:6,  695:14, 695:18,  695:23, 697:4,  697:6, 697:7, 699:5,  699:6, 699:14,  699:19, 700:12,  701:18, 701:20,  701:22, 701:24,  702:8, 702:17,  703:1, 703:6, 704:1,  704:7, 704:15,  704:16, 704:18,  706:20, 706:22,  707:6, 708:10,  709:8, 709:11,  716:3, 721:6, 721:9,  722:12, 723:3,  723:18, 723:19,  727:1, 736:6, 737:6,</p>	<p>737:7, 737:8,  737:14, 737:16,  738:2, 738:3,  738:15, 739:16,  739:18, 740:18,  740:19, 740:20,  771:10, 772:1,  772:12, 772:13,  772:21, 772:24,  773:3, 773:4, 775:7,  775:19, 776:8,  776:11, 776:15,  777:2, 777:5, 777:6,  777:8, 777:11,  777:12, 777:13,  777:17, 777:21,  777:22, 780:18,  781:19, 783:10,  783:18, 788:16,  798:4, 799:19,  801:17, 806:7,  808:8, 808:12,  809:5, 809:7, 809:9,  809:13, 809:17,  810:10, 810:15,  814:16, 824:4,  829:20, 830:21,  832:13, 832:15,  833:18, 833:19,  833:22, 833:24,  838:23, 839:1,  839:11, 839:12,  839:14, 839:16,  840:8, 847:3, 847:4,  847:5, 847:6, 847:8,  847:9, 862:19,  864:18, 872:6,  876:2, 882:16, 884:2  <b>feeding</b> [4] - 695:13,  723:1, 758:5, 758:6  <b>feet</b> [1] - 778:6  <b>felt</b> [2] - 830:23,  868:20  <b>few</b> [9] - 735:22,  736:23, 745:12,  750:24, 772:19,  804:11, 814:22,  836:6, 849:12  <b>field</b> [15] - 719:21,  721:19, 722:20,  745:24, 746:15,  770:14, 770:22,  771:5, 828:15,  829:11, 829:15,  829:20, 832:5,  836:11, 836:17  <b>fields</b> [1] - 737:24  <b>fifth</b> [16] - 703:4,  727:3, 727:4,  733:14, 733:23,</p>	<p>734:1, 735:2,  735:19, 735:20,  735:24, 736:7,  736:22, 789:11,  816:19, 868:12  <b>figure</b> [6] - 745:10,  757:9, 759:13,  789:15, 847:23,  878:4  <b>file</b> [2] - 676:10, 733:6  <b>files</b> [2] - 733:5  <b>Filing</b> [1] - 679:20  <b>filling</b> [2] - 860:10,  860:13  <b>filter</b> [1] - 701:9  <b>final</b> [3] - 849:3, 875:6,  895:19  <b>Finally</b> [1] - 830:7  <b>finally</b> [4] - 706:21,  707:17, 708:1,  842:12  <b>finances</b> [1] - 873:15  <b>financial</b> [4] - 892:13,  892:24, 893:1, 893:5  <b>findings</b> [3] - 690:24,  691:2  <b>Fine</b> [1] - 798:20  <b>fine</b> [4] - 698:18,  778:12, 854:23,  878:22  <b>fingers</b> [1] - 697:18  <b>finger tips</b> [1] - 878:4  <b>finish</b> [3] - 795:10,  868:24, 883:19  <b>finished</b> [1] - 848:2  <b>finishing</b> [3] - 875:4,  875:12, 895:15  <b>fire</b> [16] - 694:4, 694:6,  694:7, 694:21,  694:22, 702:23,  719:22, 720:13,  720:16, 726:14,  758:6, 758:9,  821:18, 836:22,  840:6  <b>firm</b> [2] - 677:22,  678:18  <b>first</b> [50] - 670:14,  675:20, 676:15,  679:3, 684:16,  694:3, 694:22,  695:12, 695:22,  695:24, 702:23,  708:5, 708:8, 716:1,  717:20, 720:6,  739:12, 741:22,  745:8, 747:7,  755:15, 755:18,  756:5, 756:11,  773:18, 784:23,</p>	<p>793:8, 800:9, 814:7,  816:10, 817:18,  822:21, 830:15,  833:18, 834:5,  836:4, 836:20,  838:8, 852:11,  856:20, 859:21,  860:11, 868:2,  872:14, 879:13,  881:14, 882:2,  883:16  <b>First</b> [6] - 679:9,  780:3, 810:1, 821:4,  822:15, 895:7  <b>fit</b> [1] - 888:19  <b>Fitzgerald</b> [2] - 669:6,  678:19  <b>FITZGERALD</b> [1] -  678:18  <b>Five</b> [3] - 668:18,  742:5, 799:12  <b>five</b> [23] - 689:22,  699:5, 699:7,  701:18, 702:20,  707:4, 743:17,  744:1, 751:19,  800:9, 803:22,  805:8, 806:13,  810:12, 814:23,  831:6, 835:20,  837:23, 850:9,  866:19, 877:15,  892:8, 894:21  <b>five-minute</b> [1] -  837:23  <b>fix</b> [3] - 793:9, 793:13,  793:19  <b>fixed</b> [1] - 794:20  <b>fixing</b> [2] - 774:24,  775:1  <b>flag</b> [1] - 772:15  <b>Flatbush</b> [2] - 755:23,  756:7  <b>flattens</b> [1] - 706:11  <b>flavor</b> [1] - 843:6  <b>flee</b> [1] - 671:4  <b>flood</b> [2] - 874:15,  875:1  <b>Floor</b> [1] - 668:21  <b>floors</b> [1] - 827:13  <b>flow</b> [9] - 671:1, 671:4,  674:23, 732:11,  739:3, 740:6,  840:12, 867:9,  867:13  <b>flowing</b> [2] - 672:18,  739:10  <b>flows</b> [1] - 840:2  <b>flu</b> [1] - 877:7  <b>flux</b> [1] - 797:18</p>
--	--	---	--	---

<p><b>focus</b> [12] - 689:21, 689:24, 710:3, 721:16, 722:24, 723:2, 754:23, 756:24, 770:21, 771:4, 845:8, 875:16</p> <p><b>focused</b> [5] - 686:16, 722:16, 771:5, 834:13, 876:1</p> <p><b>fold</b> [1] - 691:2</p> <p><b>folks</b> [17] - 705:7, 705:9, 706:7, 714:7, 714:22, 719:21, 725:6, 747:14, 748:14, 749:22, 831:3, 843:9, 847:18, 874:12, 877:11, 882:9, 886:20</p> <p><b>follow</b> [18] - 730:13, 752:8, 765:10, 778:11, 785:18, 786:8, 789:6, 816:3, 819:12, 828:16, 859:12, 872:1, 877:22, 878:5, 878:19, 884:12, 895:15, 895:18</p> <p><b>following</b> [7] - 687:9, 687:13, 687:19, 688:1, 756:7, 795:21, 857:16</p> <p><b>Following</b> [2] - 667:7, 878:13</p> <p><b>follows</b> [1] - 815:23</p> <p><b>foolproof</b> [1] - 825:11</p> <p><b>forbearance</b> [1] - 895:13</p> <p><b>forecast</b> [8] - 687:8, 810:18, 810:19, 812:8, 812:16, 813:23, 857:17, 857:19</p> <p><b>forecasted</b> [1] - 857:15</p> <p><b>forecasting</b> [1] - 816:8</p> <p><b>foremost</b> [1] - 675:20</p> <p><b>forget</b> [2] - 783:24, 860:2</p> <p><b>forgive</b> [1] - 821:15</p> <p><b>forgot</b> [1] - 781:16</p> <p><b>form</b> [6] - 674:24, 677:7, 700:20, 784:23, 784:24, 785:3</p> <p><b>formal</b> [1] - 676:2</p> <p><b>formally</b> [1] - 782:10</p> <p><b>forms</b> [5] - 700:16, 752:10, 784:13, 785:3</p>	<p><b>forth</b> [4] - 675:14, 722:4, 771:4, 842:13</p> <p><b>forward</b> [9] - 731:22, 748:24, 763:23, 764:13, 773:16, 776:23, 885:13, 885:18, 886:22</p> <p><b>Four</b> [2] - 772:5, 881:5</p> <p><b>four</b> [33] - 682:8, 683:7, 699:5, 702:19, 715:14, 715:16, 725:19, 725:21, 728:15, 742:3, 764:10, 768:19, 772:4, 772:5, 773:14, 777:13, 781:9, 781:24, 784:8, 795:17, 796:2, 798:6, 798:17, 804:20, 828:19, 828:21, 829:5, 846:13, 847:18, 851:13, 881:4</p> <p><b>frame</b> [3] - 681:14, 687:11, 748:15</p> <p><b>framework</b> [1] - 765:4</p> <p><b>frankly</b> [1] - 846:1</p> <p><b>free</b> [3] - 671:1, 672:18, 674:23</p> <p><b>freeforall</b> [1] - 675:2</p> <p><b>freely</b> [1] - 725:10</p> <p><b>frequency</b> [1] - 747:10</p> <p><b>Friday</b> [7] - 702:22, 706:19, 706:21, 710:2, 715:4, 769:12, 895:14</p> <p><b>fringe</b> [5] - 699:8, 701:17, 840:9, 840:11</p> <p><b>front</b> [2] - 703:11, 708:24</p> <p><b>full</b> [9] - 670:22, 676:8, 740:6, 795:24, 798:14, 798:15, 876:19, 895:9</p> <p><b>fully</b> [8] - 698:14, 710:3, 711:2, 723:16, 729:19, 730:23, 780:24, 852:16</p> <p><b>function</b> [3] - 733:14, 803:23, 849:7</p> <p><b>function"</b> [1] - 794:6</p> <p><b>functional</b> [1] - 750:20</p> <p><b>functionality</b> [1] - 794:9</p> <p><b>fuse</b> [3] - 781:7, 787:7, 787:17</p> <p><b>fuses</b> [5] - 759:4,</p>	<p>781:15, 782:4, 787:8, 787:19</p> <p><b>future</b> [8] - 672:9, 701:7, 731:13, 776:6, 824:21, 825:1, 829:12, 894:24</p>	<p>799:23, 804:16, 804:21, 805:15, 805:18, 805:19, 807:5, 807:6, 807:7, 807:12, 807:21, 843:11, 843:14, 853:23</p> <p><b>generator</b> [3] - 730:19, 731:5, 799:1</p> <p><b>generators</b> [9] - 716:18, 731:16, 731:18, 798:24, 807:10, 807:15, 844:14, 844:15, 844:16</p> <p><b>generic</b> [1] - 741:11</p> <p><b>geographic</b> [2] - 769:23, 777:14</p> <p><b>geographical</b> [1] - 808:4</p> <p><b>geometry</b> [1] - 792:6</p> <p><b>Gerald</b> [2] - 669:1, 678:14</p> <p><b>given</b> [7] - 676:5, 676:8, 705:21, 782:9, 830:4, 848:16, 854:14</p> <p><b>Given</b> [2] - 836:7, 836:15</p> <p><b>global</b> [2] - 710:6, 816:16</p> <p><b>goals</b> [1] - 875:24</p> <p><b>grabbed</b> [1] - 747:23</p> <p><b>granular</b> [1] - 752:12</p> <p><b>graph</b> [2] - 689:13, 800:11</p> <p><b>graphed</b> [1] - 689:12</p> <p><b>great</b> [2] - 807:20, 831:10</p> <p><b>greater</b> [9] - 727:2, 734:2, 734:17, 734:18, 824:3, 824:15, 825:2, 857:11, 874:24</p> <p><b>green</b> [5] - 683:15, 685:22, 701:21, 701:22, 806:23</p> <p><b>Greene</b> [2] - 669:5, 678:19</p> <p><b>greenhouse</b> [1] - 820:4</p> <p><b>grid</b> [22] - 683:6, 684:2, 684:5, 684:22, 686:11, 704:15, 704:16, 707:18, 712:4, 712:7, 714:20, 726:4, 727:12, 731:4, 731:8, 731:11, 739:9,</p>	<p>739:11, 752:3, 868:14</p> <p><b>grids</b> [2] - 714:21, 853:7</p> <p><b>ground</b> [5] - 696:21, 788:13, 789:1, 835:15, 845:9</p> <p><b>generator</b> [3] - 730:19, 731:5, 799:1</p> <p><b>grounded</b> [1] - 703:12</p> <p><b>grounds</b> [1] - 786:13</p> <p><b>group</b> [8] - 695:22, 729:24, 730:1, 745:7, 768:10, 768:15, 845:15, 882:13</p> <p><b>groups</b> [1] - 720:12</p> <p><b>grow</b> [2] - 824:11, 888:12</p> <p><b>growing</b> [1] - 817:15</p> <p><b>grown</b> [1] - 741:20</p> <p><b>grows</b> [1] - 824:11</p> <p><b>growth</b> [8] - 687:15, 812:23, 818:1, 871:3, 871:11, 872:4, 872:19, 879:23</p> <p><b>guarantee</b> [2] - 819:1, 825:20</p> <p><b>guaranteed</b> [1] - 818:11</p> <p><b>Guardia</b> [7] - 690:12, 804:14, 804:18, 805:1, 805:5, 806:4, 843:10</p> <p><b>guess</b> [32] - 719:7, 727:2, 727:6, 740:16, 741:11, 741:12, 743:9, 761:24, 763:17, 763:18, 765:3, 782:13, 800:9, 808:2, 817:7, 819:17, 823:12, 825:7, 825:12, 844:11, 851:19, 852:6, 854:13, 859:1, 867:9, 873:20, 882:16, 888:2, 892:13, 893:18, 893:24, 894:13</p> <p><b>guessing</b> [1] - 882:20</p> <p><b>guidance</b> [2] - 680:24, 707:15</p> <p><b>Gulf</b> [1] - 874:17</p> <p><b>guy</b> [1] - 836:14</p> <p><b>guys</b> [6] - 718:3, 751:6, 759:10, 773:12, 836:10, 854:14</p>
<b>G</b>		<p><b>gap</b> [6] - 831:20, 832:4, 832:8, 837:1, 837:2, 837:3</p> <p><b>gas</b> [3] - 742:4, 742:5, 866:3</p> <p><b>gasp</b> [1] - 753:22</p> <p><b>gasses</b> [1] - 820:4</p> <p><b>gather</b> [4] - 757:7, 791:13, 883:14, 883:22</p> <p><b>gears</b> [1] - 783:5</p> <p><b>general</b> [16] - 673:2, 675:4, 680:9, 680:14, 712:21, 714:2, 743:24, 769:23, 840:9, 842:5, 853:9, 865:2, 871:23, 873:15, 873:18, 873:21</p> <p><b>General</b> [1] - 838:2</p> <p><b>General's</b> [5] - 668:10, 668:11, 668:14, 678:11, 838:4</p> <p><b>General.....838</b> [1] - 897:6</p> <p><b>Generally</b> [4] - 684:20, 696:4, 812:22, 868:17</p> <p><b>generally</b> [15] - 703:8, 703:18, 737:8, 749:20, 754:6, 764:7, 764:12, 808:7, 810:13, 823:21, 824:12, 842:5, 865:23, 868:8, 868:10</p> <p><b>generate</b> [2] - 687:8, 713:5</p> <p><b>generated</b> [5] - 681:15, 714:12, 714:14, 760:1, 812:16</p> <p><b>Generating</b> [1] - 678:20</p> <p><b>generating</b> [1] - 681:15</p> <p><b>generation</b> [22] - 693:15, 731:7, 734:10, 734:13, 734:15, 749:5, 749:18, 750:9,</p>	<p>799:23, 804:16, 804:21, 805:15, 805:18, 805:19, 807:5, 807:6, 807:7, 807:12, 807:21, 843:11, 843:14, 853:23</p> <p><b>generator</b> [3] - 730:19, 731:5, 799:1</p> <p><b>generators</b> [9] - 716:18, 731:16, 731:18, 798:24, 807:10, 807:15, 844:14, 844:15, 844:16</p> <p><b>generic</b> [1] - 741:11</p> <p><b>geographic</b> [2] - 769:23, 777:14</p> <p><b>geographical</b> [1] - 808:4</p> <p><b>geometry</b> [1] - 792:6</p> <p><b>Gerald</b> [2] - 669:1, 678:14</p> <p><b>given</b> [7] - 676:5, 676:8, 705:21, 782:9, 830:4, 848:16, 854:14</p> <p><b>Given</b> [2] - 836:7, 836:15</p> <p><b>global</b> [2] - 710:6, 816:16</p> <p><b>goals</b> [1] - 875:24</p> <p><b>grabbed</b> [1] - 747:23</p> <p><b>granular</b> [1] - 752:12</p> <p><b>graph</b> [2] - 689:13, 800:11</p> <p><b>graphed</b> [1] - 689:12</p> <p><b>great</b> [2] - 807:20, 831:10</p> <p><b>greater</b> [9] - 727:2, 734:2, 734:17, 734:18, 824:3, 824:15, 825:2, 857:11, 874:24</p> <p><b>green</b> [5] - 683:15, 685:22, 701:21, 701:22, 806:23</p> <p><b>Greene</b> [2] - 669:5, 678:19</p> <p><b>greenhouse</b> [1] - 820:4</p> <p><b>grid</b> [22] - 683:6, 684:2, 684:5, 684:22, 686:11, 704:15, 704:16, 707:18, 712:4, 712:7, 714:20, 726:4, 727:12, 731:4, 731:8, 731:11, 739:9,</p>	<p>739:11, 752:3, 868:14</p> <p><b>grids</b> [2] - 714:21, 853:7</p> <p><b>ground</b> [5] - 696:21, 788:13, 789:1, 835:15, 845:9</p> <p><b>generator</b> [3] - 730:19, 731:5, 799:1</p> <p><b>grounded</b> [1] - 703:12</p> <p><b>grounds</b> [1] - 786:13</p> <p><b>group</b> [8] - 695:22, 729:24, 730:1, 745:7, 768:10, 768:15, 845:15, 882:13</p> <p><b>groups</b> [1] - 720:12</p> <p><b>grow</b> [2] - 824:11, 888:12</p> <p><b>growing</b> [1] - 817:15</p> <p><b>grown</b> [1] - 741:20</p> <p><b>grows</b> [1] - 824:11</p> <p><b>growth</b> [8] - 687:15, 812:23, 818:1, 871:3, 871:11, 872:4, 872:19, 879:23</p> <p><b>guarantee</b> [2] - 819:1, 825:20</p> <p><b>guaranteed</b> [1] - 818:11</p> <p><b>Guardia</b> [7] - 690:12, 804:14, 804:18, 805:1, 805:5, 806:4, 843:10</p> <p><b>guess</b> [32] - 719:7, 727:2, 727:6, 740:16, 741:11, 741:12, 743:9, 761:24, 763:17, 763:18, 765:3, 782:13, 800:9, 808:2, 817:7, 819:17, 823:12, 825:7, 825:12, 844:11, 851:19, 852:6, 854:13, 859:1, 867:9, 873:20, 882:16, 888:2, 892:13, 893:18, 893:24, 894:13</p> <p><b>guessing</b> [1] - 882:20</p> <p><b>guidance</b> [2] - 680:24, 707:15</p> <p><b>Gulf</b> [1] - 874:17</p> <p><b>guy</b> [1] - 836:14</p> <p><b>guys</b> [6] - 718:3, 751:6, 759:10, 773:12, 836:10, 854:14</p>

H				
<p><b>half</b> [13] - 682:24, 743:7, 761:4, 761:7, 761:18, 778:15, 779:10, 832:14, 839:9, 881:11, 888:12, 894:20, 894:22</p> <p><b>hampered</b> [1] - 713:10</p> <p><b>hand</b> [5] - 717:19, 800:18, 832:6, 832:22, 834:10</p> <p><b>handful</b> [4] - 736:22, 764:8, 764:9, 807:4</p> <p><b>handle</b> [2] - 834:15, 836:18</p> <p><b>handled</b> [2] - 845:10, 889:5</p> <p><b>handling</b> [1] - 806:2</p> <p><b>hands</b> [2] - 703:14, 716:12</p> <p><b>hard</b> [7] - 679:13, 679:23, 776:2, 794:10, 834:11, 834:14, 855:2</p> <p><b>hardware</b> [1] - 749:19</p> <p><b>harmful</b> [1] - 694:24</p> <p><b>harmonics</b> [3] - 701:9, 701:12, 797:19</p> <p><b>HARRIMAN</b> [3] - 672:3, 677:18, 717:20</p> <p><b>Harriman</b> [4] - 668:2, 672:3, 673:20, 677:19</p> <p><b>hate</b> [1] - 783:6</p> <p><b>Hazeltine</b> [7] - 747:4, 747:20, 747:24, 851:24, 852:6, 854:5, 854:13</p> <p><b>head</b> [2] - 839:1, 851:5</p> <p><b>headquarters</b> [2] - 755:11, 755:23</p> <p><b>headquarters'</b> [1] - 757:22</p> <p><b>hear</b> [13] - 712:18, 719:7, 720:5, 769:10, 778:13, 781:11, 833:2, 833:13, 834:5, 838:1, 873:13, 883:19, 895:23</p> <p><b>heard</b> [16] - 670:15, 755:19, 755:21, 756:12, 761:6, 769:5, 769:8, 828:18, 834:6, 836:21, 842:12, 843:10, 843:14,</p>	<p>882:14, 893:18</p> <p><b>hearing</b> [9] - 670:22, 671:20, 674:5, 675:1, 730:22, 760:18, 760:23, 762:23</p> <p><b>hearings</b> [1] - 730:15</p> <p><b>heart</b> [1] - 825:13</p> <p><b>heat</b> [16] - 692:12, 816:5, 816:7, 816:10, 816:11, 816:17, 816:21, 819:19, 840:5, 855:15, 855:18, 855:19, 871:9, 875:17</p> <p><b>heating</b> [3] - 707:8, 840:4</p> <p><b>heavy</b> [1] - 730:11</p> <p><b>Heights</b> [16] - 690:13, 725:16, 725:18, 725:23, 726:10, 726:16, 726:18, 749:1, 749:2, 804:19, 805:4, 805:9, 806:12, 838:16, 852:10, 875:24</p> <p><b>held</b> [6] - 674:21, 765:8, 789:8, 879:4, 895:6, 896:4</p> <p><b>help</b> [11] - 686:13, 716:8, 716:17, 775:22, 819:10, 826:12, 834:21, 844:5, 844:9, 844:13, 854:3</p> <p><b>Helped</b> [1] - 716:10</p> <p><b>helpful</b> [4] - 740:17, 785:5, 799:24, 869:21</p> <p><b>helping</b> [1] - 886:21</p> <p><b>Heslin</b> [2] - 668:8, 677:12</p> <p><b>HESLIN</b> [1] - 892:10</p> <p><b>hi</b> [3] - 795:24, 796:12, 847:22</p> <p><b>Hi</b> [1] - 821:1</p> <p><b>hi-pot</b> [1] - 795:24</p> <p><b>hi-pots</b> [2] - 796:12, 847:22</p> <p><b>High</b> [1] - 809:18</p> <p><b>high</b> [32] - 681:16, 685:9, 686:17, 688:12, 690:8, 691:1, 714:21, 734:6, 734:7, 734:9, 735:12, 736:2, 742:4, 746:14, 747:10, 765:1,</p>	<p>767:8, 767:13, 773:13, 773:22, 783:3, 796:16, 809:18, 817:20, 817:21, 818:1, 825:21, 832:2, 837:8, 855:19, 859:17, 864:11</p> <p><b>higher</b> [22] - 687:14, 688:1, 718:18, 743:19, 750:23, 750:24, 754:13, 755:20, 773:1, 776:8, 776:10, 777:6, 777:8, 788:7, 809:22, 812:19, 812:24, 824:8, 829:14, 833:14, 865:16, 868:12</p> <p><b>highest</b> [4] - 797:8, 811:2, 811:3, 838:9</p> <p><b>highly</b> [2] - 692:22, 832:8</p> <p><b>highways</b> [1] - 871:13</p> <p><b>hindsight</b> [2] - 792:16, 809:11</p> <p><b>historical</b> [1] - 851:17</p> <p><b>historically</b> [2] - 799:14, 816:24</p> <p><b>history</b> [1] - 764:10</p> <p><b>hit</b> [5] - 706:15, 788:17, 874:17, 874:20, 875:9</p> <p><b>hold</b> [4] - 717:12, 723:13, 748:8, 795:15</p> <p><b>holding</b> [1] - 674:15</p> <p><b>home</b> [8] - 684:4, 696:11, 709:20, 711:17, 752:22, 753:5, 822:20, 844:16</p> <p><b>homeowner</b> [1] - 860:20</p> <p><b>homes</b> [2] - 753:2, 754:12</p> <p><b>honestly</b> [1] - 849:23</p> <p><b>Honor</b> [12] - 670:12, 671:22, 672:3, 673:4, 673:19, 678:1, 679:9, 679:18, 679:24, 717:12, 717:20, 856:3</p> <p><b>hood</b> [2] - 774:14, 873:18</p> <p><b>hope</b> [1] - 766:17</p> <p><b>hopefully</b> [1] - 853:24</p> <p><b>Hopefully</b> [2] - 764:15, 891:14</p>	<p><b>hoping</b> [1] - 738:12</p> <p><b>hot</b> [5] - 718:10, 718:11, 800:10, 858:9, 860:11</p> <p><b>hour</b> [8] - 709:8, 709:11, 778:15, 779:10, 810:11, 839:9, 895:16, 895:24</p> <p><b>hourly</b> [3] - 811:2, 811:3, 811:20</p> <p><b>hours</b> [9] - 674:7, 703:8, 703:19, 704:5, 704:10, 800:14, 846:13, 876:5, 876:6</p> <p><b>house</b> [3] - 684:21, 836:20, 880:5</p> <p><b>housed</b> [1] - 684:20</p> <p><b>houses</b> [2] - 686:2, 686:8</p> <p><b>hub</b> [1] - 711:4</p> <p><b>hubs</b> [2] - 681:20, 831:14</p> <p><b>huge</b> [2] - 756:23</p> <p><b>human</b> [3] - 821:14, 837:4, 837:8</p> <p><b>hundred</b> [7] - 746:24, 776:14, 791:24, 825:10, 825:20, 888:14, 888:24</p> <p><b>hundreds</b> [1] - 732:20</p> <p><b>hung</b> [9] - 760:12, 760:14, 760:17, 760:18, 760:23, 761:7, 761:17, 762:22, 834:1</p> <p><b>Hunter</b> [1] - 749:7</p> <p><b>hurricane</b> [6] - 684:23, 874:16, 874:20, 875:9, 875:11, 877:4</p> <p><b>hurricanes</b> [1] - 874:17</p> <p><b>hurts</b> [1] - 844:11</p> <p><b>HVAC</b> [1] - 806:2</p> <p><b>hybrid</b> [1] - 674:24</p> <p><b>hypothesize</b> [1] - 671:5</p>	<p><b>identify</b> [4] - 677:5, 760:24, 762:22, 763:16</p> <p><b>immediate</b> [4] - 793:13, 836:16, 868:9</p> <p><b>immediately</b> [5] - 810:7, 836:10, 837:10, 863:5, 868:13</p> <p><b>impact</b> [15] - 681:7, 684:16, 691:6, 711:5, 758:13, 765:22, 765:23, 799:13, 817:1, 826:12, 845:3, 855:20, 859:4, 861:20, 876:7</p> <p><b>impatient</b> [1] - 714:7</p> <p><b>implement</b> [4] - 837:11, 867:21, 868:16, 868:18</p> <p><b>implementation</b> [1] - 802:8</p> <p><b>implemented</b> [4] - 730:6, 801:23, 834:20, 852:16</p> <p><b>implies</b> [1] - 890:24</p> <p><b>imply</b> [2] - 786:11, 837:8</p> <p><b>importance</b> [1] - 875:2</p> <p><b>important</b> [1] - 821:10</p> <p><b>imposition</b> [1] - 823:15</p> <p><b>impossible</b> [1] - 856:19</p> <p><b>impression</b> [1] - 741:12</p> <p><b>improbable</b> [3] - 691:22, 839:21, 857:6</p> <p><b>improve</b> [4] - 733:21, 735:16, 804:5, 854:1</p> <p><b>improvements</b> [1] - 714:10</p> <p><b>inadequate</b> [2] - 833:5, 863:7</p> <p><b>inadvertent</b> [1] - 794:12</p> <p><b>inadvertently</b> [3] - 774:10, 790:4, 794:5</p> <p><b>Inappropriateness</b> [1] - 674:11</p> <p><b>Inc</b> [4] - 667:5, 668:5, 677:11, 679:21</p> <p><b>Inc.'s</b> [1] - 667:7</p> <p><b>incentive</b> [1] - 749:19</p> <p><b>incident</b> [2] - 732:24, 758:1</p> <p><b>incipient</b> [2] - 796:21,</p>
<b>I</b>			<p><b>idea</b> [8] - 671:12, 695:21, 768:11, 777:3, 799:17, 799:20, 804:6, 804:7</p> <p><b>identification</b> [3] - 677:7, 679:17, 680:4</p> <p><b>identified</b> [5] - 678:2, 767:5, 776:14, 778:18, 875:15</p>	

<p>825:8  <b>include</b> [8] - 744:23,  874:6, 876:17,  876:19, 887:13,  890:14, 891:2,  894:10  <b>included</b> [1] - 837:6  <b>includes</b> [4] - 717:6,  781:15, 879:24,  890:11  <b>including</b> [8] - 675:5,  757:15, 769:14,  788:15, 815:14,  831:3, 834:21,  874:18  <b>including</b> [3] - 727:20,  727:21, 888:15  <b>Inconsistencies</b> [1] -  672:10  <b>Incorporating</b> [1] -  784:12  <b>Incorrect</b> [2] - 670:19,  733:6  <b>increase</b> [8] - 704:11,  820:8, 855:9, 856:9,  857:21, 872:2,  890:18, 891:7  <b>Increased</b> [10] -  713:17, 733:11,  733:13, 840:3,  876:24, 877:2,  877:15, 890:10,  891:8  <b>Increases</b> [13] -  686:19, 692:9,  775:13, 839:12,  839:13, 839:15,  839:17, 855:11,  855:14, 855:15,  855:17, 890:4  <b>Increasing</b> [2] - 856:6,  864:22  <b>Increasing</b> [11] -  776:9, 855:10,  856:3, 856:4, 856:6,  856:15, 864:20,  864:22  <b>incur</b> [1] - 894:23  <b>Incurred</b> [2] - 824:22,  889:7  <b>Independent</b> [3] -  705:17, 817:9, 818:3  <b>Independents</b> [1] -  866:4  <b>Indicate</b> [4] - 670:20,  759:17, 776:20,  786:15  <b>Indicated</b> [7] - 682:11,  708:13, 737:18,  774:16, 780:19,</p>	<p>805:17, 887:1  <b>Indicating</b> [4] -  720:15, 790:3,  790:7, 790:8  <b>Indication</b> [20] -  699:2, 707:17,  708:16, 709:18,  714:24, 719:19,  758:2, 762:4,  770:13, 772:15,  774:7, 787:5,  787:15, 788:10,  788:19, 790:20,  793:11, 830:18,  841:8, 851:15  <b>Indications</b> [2] -  860:23, 863:9  <b>Indicator</b> [1] - 707:14  <b>Indirect</b> [1] - 707:4  <b>Individual</b> [17] - 682:6,  682:9, 682:21,  758:7, 782:16,  782:22, 783:17,  805:21, 813:23,  813:24, 860:6,  860:20, 861:17,  862:24, 864:13,  874:6, 885:1  <b>Individually</b> [1] -  828:6  <b>Individuals</b> [1] -  849:17  <b>Industrial</b> [11] -  693:14, 734:12,  734:18, 734:21,  765:14, 765:17,  780:11, 780:12,  826:20, 826:23,  844:17  <b>Industry</b> [2] - 745:8,  853:10  <b>Inform</b> [1] - 712:13  <b>Informal</b> [1] - 676:2  <b>Information</b> [49] -  671:4, 674:23,  712:16, 713:8,  713:15, 715:4,  723:12, 725:9,  725:12, 733:7,  735:7, 737:6, 744:4,  744:7, 753:11,  753:16, 758:7,  761:17, 762:7,  762:8, 764:23,  765:16, 769:19,  770:17, 774:11,  776:16, 786:11,  794:12, 797:2,  802:12, 802:22,  802:23, 804:4,</p>	<p>807:20, 812:2,  813:3, 815:13,  815:16, 823:4,  834:23, 875:21,  877:22, 878:3,  878:6, 878:7,  878:19, 883:23,  885:15, 886:11  <b>Infrastructure</b> [7] -  747:18, 748:22,  753:14, 864:8,  879:16, 881:23  <b>ingress</b> [1] - 806:1  <b>Initial</b> [2] - 830:7,  886:18  <b>Initiate</b> [2] - 829:24,  864:15  <b>initiated</b> [5] - 705:17,  705:19, 859:5,  872:11, 872:14  <b>Initiatives</b> [1] - 845:24  <b>inputs</b> [1] - 732:21  <b>Inquisition</b> [1] - 674:8  <b>inrush</b> [25] - 700:2,  700:4, 700:20,  700:24, 701:11,  772:3, 773:14,  773:18, 773:19,  774:12, 776:8,  776:10, 783:6,  783:16, 784:4,  784:9, 785:11,  797:9, 797:11,  797:16, 797:24,  798:15, 810:5,  847:24, 848:1  <b>inrushes</b> [1] - 803:20  <b>inside</b> [4] - 696:8,  697:14, 712:7,  752:22  <b>insight</b> [1] - 715:11  <b>insofar</b> [1] - 671:23  <b>inspected</b> [3] -  741:15, 780:6,  791:17  <b>Inspection</b> [5] -  729:22, 743:14,  743:24, 803:24,  873:4  <b>inspections</b> [2] -  803:21, 825:4  <b>Install</b> [6] - 747:11,  751:18, 754:22,  818:16, 852:13,  853:24  <b>Installation</b> [1] -  789:18  <b>installations</b> [1] -  698:5  <b>Installed</b> [11] - 743:6,</p>	<p>749:7, 752:5,  773:20, 773:24,  774:3, 786:4,  789:19, 791:8,  805:20, 854:1  <b>installing</b> [6] - 717:8,  744:6, 747:16,  774:1, 835:22  <b>Instance</b> [2] - 697:7,  850:12  <b>Instances</b> [1] - 796:2  <b>Instead</b> [1] - 752:18  <b>instead</b> [1] - 746:23  <b>instituted</b> [3] - 673:8,  674:3, 801:7  <b>instructed</b> [1] - 778:24  <b>insulator</b> [1] - 696:21  <b>Insurance</b> [4] -  889:15, 889:16,  894:19, 894:21  <b>Integrate</b> [2] - 815:13,  815:16  <b>Integrated</b> [2] -  758:12, 884:19  <b>Integrating</b> [2] -  815:18, 885:2  <b>Intelligence</b> [2] -  754:1, 830:5  <b>intelligent</b> [1] - 832:8  <b>Intend</b> [1] - 672:15  <b>intended</b> [1] - 794:9  <b>intending</b> [1] - 804:3  <b>intense</b> [1] - 730:11  <b>intensive</b> [1] - 738:8  <b>intent</b> [1] - 813:6  <b>intention</b> [2] - 735:17,  744:22  <b>interconnected</b> [1] -  686:11  <b>Interest</b> [1] - 675:13  <b>Interested</b> [2] -  748:10, 873:20  <b>interim</b> [3] - 830:6,  834:19, 845:22  <b>interject</b> [2] - 752:8,  866:15  <b>Interlude</b> [1] - 854:4  <b>intermeshed</b> [1] -  861:16  <b>internal</b> [2] - 806:17,  807:16  <b>internally</b> [1] - 806:15  <b>interrogatories</b> [3] -  674:6, 674:8, 810:24  <b>interrupted</b> [2] -  688:15, 809:16  <b>Interruption</b> [6] -  688:10, 688:16,  689:1, 689:2, 689:4  <b>Intersection</b> [2] -</p>	<p>683:22, 694:2  <b>Interval</b> [1] - 768:16  <b>introduce</b> [3] - 680:5,  680:16, 869:4  <b>Invested</b> [3] - 870:16,  873:7, 894:11  <b>investigate</b> [2] -  670:2, 832:21  <b>Investigating</b> [1] -  751:11  <b>Investigation</b> [1] -  667:7  <b>investigation</b> [6] -  673:1, 673:9, 674:3,  674:4, 674:9, 759:11  <b>Investigations</b> [1] -  674:16  <b>investing</b> [1] - 887:1  <b>Investment</b> [14] -  681:12, 817:23,  820:2, 869:8,  871:17, 871:20,  871:22, 872:2,  872:11, 879:9,  879:15, 879:20,  881:14  <b>Investments</b> [4] -  879:8, 882:1, 887:8,  891:12  <b>Involved</b> [6] - 675:4,  703:9, 791:12,  828:21, 853:16,  895:10  <b>IR</b> [2] - 854:21, 878:11  <b>Irving</b> [2] - 668:8,  755:12  <b>Island</b> [117] - 670:3,  673:1, 680:2,  680:10, 680:21,  681:3, 681:24,  682:1, 682:8, 683:9,  688:23, 689:21,  689:24, 690:2,  690:10, 690:14,  692:21, 694:1,  700:21, 701:16,  702:17, 708:15,  710:18, 710:21,  710:23, 711:3,  717:5, 720:11,  725:15, 725:20,  725:21, 727:7,  727:16, 728:3,  729:4, 729:15,  734:14, 739:14,  740:19, 741:10,  741:14, 742:23,  743:7, 743:11,  743:23, 744:9,  744:10, 755:5,</p>
---	---	---	---	---

758:18, 762:19, 762:21, 762:23, 763:7, 767:4, 769:19, 773:12, 774:3, 775:11, 775:21, 776:6, 777:2, 777:10, 778:1, 778:3, 778:6, 778:7, 779:24, 786:5, 793:17, 793:18, 793:20, 799:1, 804:12, 804:13, 805:3, 805:7, 807:5, 812:23, 813:14, 824:1, 825:9, 825:22, 826:9, 826:12, 826:14, 826:21, 830:11, 838:10, 842:1, 842:15, 843:20, 850:12, 858:19, 865:5, 865:6, 865:16, 866:7, 870:13, 870:17, 870:20, 870:24, 871:2, 881:12, 882:17, 882:24, 883:7, 883:15, 884:15, 885:4, 885:6, 887:2, 891:13, 891:17, 891:24, 892:4, 892:23 <b>ISO</b> [6] - 811:11, 818:3, 866:14, 867:19, 867:20, 868:1 <b>isolated</b> [7] - 703:12, 739:19, 759:5, 759:6, 768:3, 768:20, 860:6 <b>issue</b> [29] - 673:18, 676:12, 703:2, 711:7, 731:23, 731:24, 738:20, 739:14, 739:24, 742:9, 743:10, 756:23, 759:20, 772:4, 774:12, 774:23, 775:21, 783:16, 785:5, 785:7, 788:18, 790:17, 809:18, 809:20, 832:11, 835:19, 841:11, 861:5, 861:6 <b>issues</b> [22] - 671:15, 676:13, 711:6, 726:22, 731:22, 742:19, 749:9,	772:9, 773:4, 775:24, 805:13, 806:1, 823:13, 835:18, 846:14, 860:5, 863:4, 864:14, 864:17, 875:9, 895:10, 895:24 <b>item</b> [1] - 891:4 <b>items</b> [1] - 776:23 <b>itself</b> [6] - 673:15, 694:23, 735:10, 739:13, 750:14, 816:11  <b>J</b> <b>Jackson</b> [5] - 690:13, 804:19, 805:4, 805:9, 806:12 <b>Jody</b> [1] - 872:13 <b>Joe</b> [4] - 766:23, 804:24, 845:5, 845:20 <b>John</b> [28] - 668:17, 677:17, 680:5, 680:6, 680:18, 691:13, 691:16, 693:17, 702:9, 702:23, 703:3, 705:12, 716:1, 717:23, 721:2, 738:22, 756:3, 757:5, 774:16, 775:24, 858:1, 866:12, 869:23, 870:1, 873:2, 884:12, 884:23 <b>John's</b> [1] - 702:12 <b>joint</b> [2] - 795:23, 847:21 <b>joints</b> [2] - 737:20, 871:9 <b>Joseph</b> [1] - 680:11 <b>Judge</b> [2] - 667:15, 676:23 <b>JUDGE</b> [84] - 670:1, 672:1, 673:17, 674:10, 674:14, 676:23, 678:7, 678:17, 678:22, 679:2, 679:6, 679:15, 680:17, 717:14, 717:18, 728:21, 730:13, 731:9, 731:13, 752:8, 759:16, 760:5, 760:13, 761:9, 761:13, 761:16, 761:23, 762:17, 763:4,	763:10, 765:7, 766:21, 778:8, 778:14, 779:9, 784:20, 789:5, 792:19, 795:5, 795:9, 795:12, 798:21, 799:3, 813:2, 815:21, 819:12, 820:12, 820:22, 822:24, 828:16, 829:2, 829:7, 836:6, 837:23, 838:1, 849:11, 854:19, 855:1, 855:4, 856:18, 866:15, 866:19, 866:24, 868:22, 869:3, 869:11, 869:17, 870:5, 877:21, 878:1, 878:21, 879:1, 879:3, 879:5, 880:13, 880:19, 883:19, 886:4, 886:9, 887:23, 888:4, 888:21, 895:3, 895:7 <b>Judgment</b> [1] - 772:23 <b>Judgments</b> [1] - 841:17 <b>July</b> [18] - 667:8, 679:11, 679:23, 690:9, 702:14, 728:4, 729:7, 729:13, 732:24, 733:8, 791:19, 791:22, 811:1, 838:17, 850:12, 858:9, 859:21, 875:18 <b>Jumper</b> [3] - 789:18, 793:19 <b>jumpers</b> [1] - 793:24 <b>June</b> [1] - 688:6 <b>Jurisdiction</b> [1] - 837:12  <b>K</b> <b>Katrina</b> [1] - 874:16 <b>keep</b> [11] - 677:7, 691:18, 749:19, 771:16, 778:9, 782:10, 790:13, 800:1, 834:12, 846:17, 891:15 <b>Keep</b> [1] - 756:20 <b>keeping</b> [1] - 881:6 <b>keeps</b> [3] - 674:2, 684:22, 881:3 <b>KEMA</b> [1] - 751:3	<b>kept</b> [2] - 756:20, 823:4 <b>KETSCHKE</b> [1] - 767:22 <b>Ketschke</b> [43] - 680:9, 717:24, 719:6, 720:22, 721:4, 722:14, 722:18, 723:2, 723:9, 724:9, 724:13, 724:24, 738:6, 745:14, 746:9, 758:4, 763:19, 769:20, 770:9, 770:16, 770:21, 777:5, 777:16, 777:22, 778:2, 778:4, 780:22, 782:11, 782:18, 787:20, 802:4, 802:19, 812:14, 815:12, 860:2, 860:19, 861:15, 862:6, 862:22, 863:14, 864:3, 864:13, 864:22 <b>key</b> [1] - 705:11 <b>Kim</b> [1] - 672:3 <b>Kimberly</b> [2] - 668:2, 677:19 <b>kind</b> [22] - 699:15, 715:5, 730:15, 738:24, 740:21, 747:7, 750:1, 757:13, 777:3, 788:23, 816:16, 816:18, 832:2, 836:3, 836:4, 862:15, 878:8, 881:6, 882:15, 885:5, 892:20, 893:10 <b>Kind</b> [1] - 751:2 <b>kinds</b> [2] - 744:5, 759:4 <b>knocked</b> [1] - 847:24 <b>knowing</b> [3] - 765:23, 769:23, 788:12 <b>knowledge</b> [6] - 737:2, 740:10, 751:5, 804:23, 807:19, 832:10 <b>known</b> [4] - 768:10, 787:21, 797:14, 803:24 <b>Krayeske</b> [2] - 668:6, 677:12 <b>KRAYESKE</b> [1] - 892:18 <b>kv</b> [13] - 682:4, 686:7,	695:17, 696:9, 801:17, 808:8, 808:18, 859:14, 859:18, 859:19, 867:6, 867:9, 867:13 <b>kva</b> [1] - 696:3  <b>L</b> <b>L.L.P</b> [1] - 668:23 <b>labor</b> [1] - 738:8 <b>lack</b> [7] - 771:21, 828:15, 832:10, 834:7, 851:5, 853:14, 859:10 <b>LaGuardia</b> [1] - 734:14 <b>Lamb</b> [2] - 669:5, 678:19 <b>Lane</b> [1] - 872:13 <b>lane</b> [1] - 694:15 <b>lanes</b> [1] - 737:15 <b>LANIADO</b> [1] - 677:13 <b>Laniado</b> [2] - 677:14 <b>large</b> [30] - 689:11, 693:13, 697:13, 707:13, 715:20, 727:11, 745:4, 751:4, 766:14, 767:2, 767:5, 767:12, 767:23, 768:5, 778:7, 799:22, 826:19, 827:11, 827:15, 830:11, 842:13, 842:14, 843:18, 850:19, 858:10, 863:10, 864:2, 872:8, 879:22, 880:9 <b>larger</b> [6] - 756:20, 758:8, 768:14, 804:12, 824:4, 860:24 <b>largest</b> [1] - 847:1 <b>last</b> [21] - 680:15, 728:22, 730:15, 751:17, 753:12, 753:22, 773:13, 785:9, 792:2, 794:4, 795:5, 799:1, 801:20, 814:12, 848:8, 874:14, 882:22, 884:12, 884:21, 888:22, 890:1 <b>Last</b> [1] - 813:4 <b>late</b> [4] - 747:2, 757:5, 766:10, 852:15 <b>latest</b> [1] - 846:13 <b>Law</b> [5] - 667:15, 669:1, 669:2,
--	---	---	---	--

<p>676:23, 678:13  <b>law</b> [2] - 677:22, 678:18  <b>lay</b> [1] - 852:17  <b>layout</b> [2] - 883:2  <b>layouts</b> [2] - 717:6, 881:18  <b>lead</b> [3] - 692:6, 778:20, 871:9  <b>leading</b> [2] - 852:20, 856:13  <b>leads</b> [1] - 759:7  <b>leak</b> [1] - 742:12  <b>leaks</b> [1] - 742:8  <b>lean</b> [1] - 792:7  <b>learn</b> [1] - 735:14  <b>learned</b> [1] - 769:12  <b>learning</b> [1] - 735:21  <b>least</b> [10] - 699:6, 750:5, 787:14, 792:15, 796:2, 807:9, 827:14, 830:9, 874:8, 876:16  <b>leave</b> [1] - 877:5  <b>leaves</b> [1] - 742:13  <b>leaving</b> [3] - 833:8, 853:15, 876:11  <b>LeBoeuf</b> [2] - 669:5, 678:19  <b>left</b> [7] - 699:22, 701:15, 701:17, 735:1, 795:14, 842:3, 854:15  <b>less</b> [9] - 676:19, 687:15, 734:17, 735:5, 783:3, 814:16, 816:23, 868:5  <b>lesser</b> [2] - 734:17, 825:18  <b>level</b> [36] - 685:9, 685:17, 691:1, 722:8, 748:6, 748:17, 750:22, 773:13, 773:23, 805:22, 816:22, 820:7, 821:11, 824:2, 824:3, 829:13, 829:15, 831:10, 831:21, 831:22, 831:24, 833:1, 833:14, 837:7, 837:11, 851:20, 854:21, 857:24, 862:14, 868:13, 872:11, 875:20, 879:13, 879:15  <b>levels</b> [5] - 734:6, 788:6, 824:8,</p>	<p>828:15, 858:24  <b>liaison</b> [1] - 845:16  <b>Liam</b> [1] - 678:20  <b>LIC</b> [3] - 744:19, 808:24, 812:9  <b>life</b> [4] - 707:9, 744:23, 745:3, 749:24  <b>lifting</b> [2] - 730:11, 730:12  <b>light</b> [19] - 698:1, 698:4, 698:5, 698:9, 698:15, 698:17, 758:24, 790:7, 790:13, 790:19, 791:2, 791:3, 794:1, 806:23, 823:3, 833:4  <b>lighted</b> [2] - 690:8, 714:21  <b>lights</b> [14] - 682:14, 710:24, 758:19, 758:23, 759:2, 760:2, 790:3, 790:8, 790:18, 790:19, 790:22, 791:4, 849:4, 860:23  <b>likelihood</b> [2] - 773:2, 862:3  <b>likely</b> [2] - 778:24, 782:10  <b>limitation</b> [2] - 774:19, 806:15  <b>limits</b> [1] - 856:14  <b>line</b> [20] - 681:13, 681:18, 682:7, 683:20, 700:20, 704:3, 704:22, 709:9, 712:12, 720:14, 729:8, 747:9, 749:14, 808:12, 808:13, 854:23, 890:12, 891:4, 891:15  <b>lines</b> [13] - 683:19, 710:16, 710:17, 711:18, 713:17, 713:18, 758:5, 760:9, 779:12, 801:23, 808:3, 809:21  <b>linked</b> [1] - 884:11  <b>lion's</b> [1] - 847:13  <b>list</b> [8] - 741:18, 741:20, 741:22, 742:3, 742:6, 778:9, 795:17, 795:19  <b>listen</b> [2] - 779:9, 843:24  <b>lit</b> [2] - 790:14, 791:2  <b>literally</b> [2] - 696:13, 764:8</p>	<p><b>litigants</b> [1] - 670:21  <b>litigation</b> [1] - 673:5  <b>live</b> [4] - 821:1, 822:19, 828:23, 836:17  <b>lived</b> [1] - 701:21  <b>living</b> [2] - 823:22, 837:4  <b>LLP</b> [1] - 677:15  <b>load</b> [136] - 686:19, 687:7, 687:8, 688:2, 688:24, 690:17, 692:12, 692:17, 693:12, 695:5, 702:2, 702:4, 704:22, 705:2, 705:6, 705:13, 706:7, 707:23, 708:21, 708:22, 709:2, 709:3, 709:4, 722:1, 725:3, 732:11, 732:15, 734:8, 734:11, 734:15, 734:23, 736:1, 736:2, 736:3, 737:9, 745:16, 746:3, 746:14, 746:18, 765:13, 765:18, 765:19, 767:24, 768:2, 768:6, 768:8, 768:17, 777:6, 780:13, 782:5, 783:1, 783:14, 799:16, 800:7, 800:12, 803:13, 805:5, 805:6, 805:8, 805:10, 806:21, 807:1, 809:21, 809:22, 810:4, 810:17, 813:13, 813:20, 813:22, 814:1, 814:4, 814:8, 816:7, 816:12, 816:17, 816:21, 817:14, 818:6, 819:5, 819:24, 820:6, 820:20, 824:10, 826:14, 827:3, 827:20, 839:17, 840:6, 843:9, 843:14, 843:17, 844:2, 844:4, 846:23, 847:1, 847:5, 847:7, 855:9, 855:10, 856:3, 856:4, 856:6, 856:15, 857:19, 857:21, 858:11, 858:12, 858:15,</p>	<p>858:19, 858:24, 860:8, 860:10, 861:8, 861:17, 861:20, 861:22, 861:24, 863:17, 864:10, 865:1, 865:2, 865:6, 865:7, 867:3, 867:7, 867:8, 867:21, 868:2, 868:3  <b>loaded</b> [2] - 692:22, 777:8  <b>loading</b> [12] - 707:5, 719:18, 732:7, 733:5, 737:15, 802:7, 810:17, 830:17, 841:6, 841:7  <b>loadings</b> [3] - 724:23, 764:24  <b>loads</b> [7] - 687:6, 721:14, 724:24, 725:1, 738:1, 768:21, 802:6  <b>locally</b> [2] - 865:20, 866:6  <b>locate</b> [1] - 796:15  <b>located</b> [2] - 695:15, 865:13  <b>location</b> [11] - 716:7, 771:2, 783:9, 788:3, 788:4, 788:10, 788:12, 788:17, 788:18, 788:20, 846:9  <b>log</b> [1] - 884:9  <b>logistical</b> [1] - 716:8  <b>logs</b> [3] - 802:7, 803:2, 884:13  <b>look</b> [34] - 685:14, 701:4, 715:11, 743:12, 743:20, 744:18, 746:9, 750:10, 765:13, 775:20, 785:10, 789:3, 793:2, 798:13, 798:17, 803:12, 803:14, 804:3, 806:21, 809:7, 813:15, 814:9, 815:5, 836:3, 849:24, 850:15, 853:2, 853:3, 857:13, 857:22, 868:13, 875:13, 889:23, 892:20  <b>looked</b> [17] - 675:1, 675:2, 675:3, 675:17, 703:21, 722:1, 761:2, 762:11, 765:12, 766:5, 782:23,</p>	<p>783:20, 796:7, 881:8, 884:20, 885:3, 885:6  <b>looking</b> [32] - 687:6, 687:11, 689:17, 700:15, 707:20, 721:5, 721:12, 724:22, 726:2, 743:23, 744:24, 746:6, 751:6, 753:9, 754:17, 775:3, 788:23, 796:10, 797:15, 803:20, 813:24, 814:2, 814:7, 830:16, 830:23, 831:16, 848:22, 855:12, 857:17, 881:10, 881:14, 884:22  <b>Looking</b> [1] - 891:12  <b>looks</b> [15] - 702:15, 704:4, 707:2, 732:14, 756:3, 756:4, 763:17, 766:12, 783:19, 792:8, 803:11, 810:24, 811:2, 819:4, 829:19  <b>lose</b> [4] - 697:4, 723:6, 847:9, 867:4  <b>loss</b> [8] - 684:11, 723:22, 744:18, 744:23, 745:3, 766:3, 847:13, 848:18  <b>Loss</b> [1] - 723:23  <b>lost</b> [5] - 684:15, 726:12, 765:11, 847:10, 849:4  <b>Loughney</b> [2] - 668:22, 677:22  <b>LOUGHNEY</b> [2] - 677:21, 779:14  <b>low</b> [52] - 681:16, 696:10, 771:17, 771:21, 782:5, 786:10, 786:15, 786:22, 786:23, 787:10, 787:14, 788:19, 806:9, 821:20, 822:13, 822:23, 833:7, 835:1, 836:16, 848:14, 848:21, 848:23, 855:18, 856:16, 857:2, 859:22, 859:23, 860:3, 860:8, 860:12, 860:15, 860:17, 860:18,</p>
--	--	---	---	---

860:23, 861:3, 861:10, 861:12, 861:14, 862:2, 862:4, 862:10, 862:18, 862:21, 863:1, 863:9, 863:15, 863:21, 864:1, 864:3, 864:12, 864:14, 864:19 <b>lower</b> [8] - 701:11, 706:10, 754:20, 797:10, 816:22, 820:6, 820:8 <b>lowered</b> [1] - 867:22 <b>LUBLING</b> [10] - 670:12, 673:19, 674:13, 676:22, 677:10, 678:24, 679:9, 679:18, 820:13, 822:3 <b>Lubling</b> [4] - 668:6, 675:11, 677:11, 679:7 <b>Lubling's</b> [1] - 672:12 <b>lunch</b> [1] - 779:11 <b>Lunch</b> [1] - 779:13	748:6, 825:5, 869:7, 870:22, 880:5, 887:6, 887:20, 888:7, 893:7 <b>major</b> [11] - 690:24, 711:7, 749:9, 764:5, 799:22, 843:3, 866:1, 871:12, 872:1, 876:10, 876:12 <b>majority</b> [11] - 711:20, 712:11, 721:8, 722:22, 766:12, 768:5, 863:14, 863:20, 863:21, 865:19, 890:17 <b>malfunctioning</b> [1] - 733:1 <b>manage</b> [1] - 816:15 <b>managed</b> [1] - 863:17 <b>management</b> [19] - 751:15, 751:19, 751:23, 752:7, 752:10, 752:11, 753:20, 757:3, 759:21, 817:4, 819:22, 820:14, 820:19, 826:7, 826:18, 836:12, 845:14, 846:4, 846:8 <b>manager</b> [5] - 680:9, 680:10, 680:12, 680:14, 842:6 <b>managers</b> [1] - 849:20 <b>mandate</b> [1] - 805:19 <b>Manhattan</b> [7] - 730:3, 754:7, 754:10, 754:14, 754:19, 754:22, 770:10 <b>manhole</b> [11] - 675:17, 709:18, 720:16, 720:17, 720:19, 746:6, 769:16, 769:21, 773:9, 834:24, 873:4 <b>manholes</b> [5] - 684:21, 693:3, 694:4, 694:21, 720:10 <b>manner</b> [1] - 810:15 <b>manual</b> [4] - 733:9, 733:14, 735:6, 849:22 <b>manually</b> [2] - 733:10, 800:23 <b>manufacturer</b> [4] - 745:7, 747:4, 793:3, 793:6 <b>manufacturers</b> [1] - 804:5	<b>map</b> [2] - 701:15, 710:6 <b>maps</b> [6] - 814:22, 815:1, 815:5, 815:7, 815:12, 815:15 <b>Marc</b> [2] - 668:7, 677:11 <b>March</b> [1] - 791:17 <b>margin</b> [3] - 776:13, 820:9, 824:12 <b>mark</b> [1] - 679:15 <b>marked</b> [4] - 679:17, 679:19, 679:24, 680:4 <b>market</b> [3] - 674:21, 750:6, 817:18 <b>Martin</b> [2] - 668:8, 677:12 <b>Mary</b> [6] - 668:6, 668:13, 677:12, 678:12, 680:12, 838:4 <b>masse</b> [1] - 726:5 <b>master</b> [3] - 828:1, 828:5, 828:9 <b>match</b> [1] - 761:4 <b>material</b> [1] - 686:2 <b>materials</b> [1] - 824:23 <b>math</b> [1] - 819:4 <b>Matt</b> [8] - 680:8, 717:23, 719:6, 719:9, 721:2, 756:6, 756:8, 763:13 <b>Matt's</b> [2] - 720:5, 747:14 <b>Matter</b> [2] - 667:6, 756:16 <b>matter</b> [10] - 672:10, 675:10, 675:15, 675:23, 676:19, 678:9, 679:4, 679:5, 736:6, 772:21 <b>Mauro</b> [3] - 678:5, 779:14, 779:18 <b>MAURO</b> [9] - 785:17, 789:4, 789:9, 794:2, 795:7, 795:13, 799:4, 804:9, 814:20 <b>maximum</b> [1] - 833:19 <b>maze</b> [1] - 882:12 <b>McCurtny</b> [1] - 680:13 <b>MCKNIGHT</b> [8] - 760:17, 761:12, 761:15, 761:18, 762:6, 762:20, 763:6, 763:11 <b>McKnight</b> [1] - 680:14 <b>mean</b> [14] - 688:18, 689:7, 718:7,	720:20, 740:9, 770:19, 817:20, 826:10, 830:7, 834:17, 835:19, 846:22, 855:10, 884:1 <b>meaning</b> [2] - 702:1, 765:1 <b>means</b> [12] - 688:13, 688:16, 699:9, 721:24, 730:17, 739:10, 741:1, 780:14, 842:5, 856:4, 856:6, 878:10 <b>meant</b> [4] - 701:20, 729:24, 847:15, 886:2 <b>measure</b> [4] - 689:1, 719:20, 737:9, 858:18 <b>measured</b> [1] - 844:20 <b>measurement</b> [1] - 752:20 <b>measures</b> [4] - 706:3, 719:17, 816:15, 857:20 <b>measuring</b> [2] - 798:3, 858:4 <b>mechanical</b> [1] - 742:11 <b>mechanics</b> [1] - 740:9 <b>mechanism</b> [3] - 674:18, 745:22, 872:17 <b>mechanisms</b> [1] - 745:14 <b>media</b> [2] - 769:14, 829:4 <b>medical</b> [1] - 836:23 <b>meet</b> [2] - 688:2, 782:24 <b>meeting</b> [5] - 675:3, 678:2, 805:12, 841:10, 875:6 <b>meetings</b> [1] - 724:14 <b>megaVAR</b> [4] - 858:5, 865:22, 867:2, 867:4 <b>megaVARS</b> [4] - 867:5, 867:6, 867:9, 867:13 <b>megawatt</b> [4] - 690:18, 704:24, 705:1, 807:15 <b>megawatts</b> [22] - 686:21, 690:17, 705:3, 803:12, 803:13, 805:6, 805:8, 805:10, 806:13, 810:18, 812:5, 819:3, 819:5,	819:24, 820:6, 820:8, 820:20, 844:21, 844:23, 857:14, 858:4, 866:2 <b>members</b> [1] - 869:18 <b>men</b> [1] - 788:14 <b>mention</b> [2] - 709:3, 832:1 <b>Mention</b> [1] - 865:4 <b>mentioned</b> [36] - 690:16, 690:21, 705:2, 708:20, 709:17, 710:11, 711:15, 716:1, 718:4, 720:6, 720:13, 739:17, 748:19, 771:8, 776:1, 777:1, 781:20, 795:14, 802:11, 807:17, 821:19, 846:7, 850:8, 851:3, 851:4, 851:23, 852:3, 854:6, 856:3, 857:16, 858:1, 867:19, 876:6, 889:17, 894:23 <b>mentions</b> [1] - 843:5 <b>mesh</b> [2] - 693:24, 759:6 <b>meshed</b> [1] - 861:10 <b>message</b> [8] - 712:19, 713:19, 713:24, 760:8, 760:12, 760:18, 761:6, 762:23 <b>messages</b> [1] - 760:23 <b>met</b> [1] - 875:7 <b>metal</b> [2] - 792:5, 821:13 <b>meter</b> [29] - 751:13, 752:12, 752:17, 752:19, 752:23, 753:2, 753:4, 753:9, 753:11, 753:18, 753:21, 754:16, 754:17, 754:19, 754:24, 765:15, 822:16, 823:5, 823:17, 827:24, 828:2, 828:9, 828:12, 828:20, 833:3, 835:7, 848:15, 848:24 <b>metered</b> [1] - 828:6 <b>metering</b> [7] - 750:13, 768:16, 828:5, 828:17, 835:5, 835:6 <b>meters</b> [12] - 751:20, 753:15, 753:16,
<b>M</b>				
<b>machines</b> [1] - 866:3 <b>MacRae</b> [2] - 669:5, 678:19 <b>magnetize</b> [1] - 700:6 <b>magnetizing</b> [5] - 700:24, 797:6, 797:16, 797:17, 810:5 <b>magnitude</b> [5] - 760:3, 767:11, 767:16, 874:24, 875:10 <b>mail</b> [1] - 878:22 <b>mails</b> [1] - 878:21 <b>main</b> [7] - 685:24, 699:20, 748:13, 758:11, 771:3, 830:13, 891:2 <b>main</b> [5] - 694:12, 694:13, 694:14, 725:24, 801:18 <b>maintain</b> [10] - 681:6, 691:5, 703:24, 707:3, 707:21, 710:14, 724:20, 830:24, 834:11, 860:15 <b>maintained</b> [1] - 748:24 <b>maintaining</b> [1] - 725:6 <b>maintenance</b> [9] -				

<p>754:13, 754:16, 754:23, 828:1, 828:11, 835:14, 835:21, 848:11, 849:6</p> <p><b>meticulous</b> [1] - 882:21</p> <p><b>Michael</b> [4] - 668:20, 677:19, 677:23, 717:21</p> <p><b>microprocessor</b> [1] - 785:22</p> <p><b>mid</b> [5] - 727:19, 728:4, 730:2, 730:12, 848:4</p> <p><b>mid-2006</b> [1] - 886:12</p> <p><b>mid-December</b> [4] - 727:19, 728:4, 730:2, 730:12</p> <p><b>middle</b> [3] - 699:11, 828:10, 889:6</p> <p><b>midnight</b> [6] - 717:3, 717:4, 729:10, 731:2, 816:20, 842:9</p> <p><b>midst</b> [1] - 785:14</p> <p><b>midtown</b> [1] - 690:6</p> <p><b>Might</b> [1] - 700:3</p> <p><b>might</b> [28] - 713:21, 737:2, 737:12, 737:14, 737:15, 755:20, 756:13, 758:23, 759:1, 762:3, 776:21, 780:12, 780:23, 782:16, 788:5, 804:22, 807:20, 809:2, 818:18, 824:12, 828:21, 842:22, 849:22, 849:23, 863:12, 869:21, 877:12</p> <p><b>Mike</b> [7] - 717:22, 730:5, 753:24, 759:20, 785:19, 835:12, 890:15</p> <p><b>Mike's</b> [3] - 729:17, 830:2, 868:10</p> <p><b>Miksal</b> [119] - 680:5, 680:18, 702:9, 717:23, 718:21, 719:3, 720:9, 720:21, 723:8, 723:24, 725:5, 725:17, 726:14, 727:9, 727:18, 727:21, 727:24, 728:6, 728:14, 732:10, 738:4, 738:20, 740:23, 745:2, 747:2,</p>	<p>750:22, 750:24, 751:10, 752:4, 754:10, 755:1, 755:3, 755:8, 757:16, 759:15, 763:24, 764:6, 773:18, 778:18, 778:23, 779:3, 780:23, 781:24, 801:3, 801:7, 803:9, 803:16, 804:24, 811:8, 811:17, 811:20, 811:24, 812:2, 812:16, 812:22, 813:10, 813:17, 814:19, 815:3, 822:14, 823:1, 823:7, 824:14, 825:3, 826:10, 829:16, 830:14, 833:17, 834:4, 838:22, 841:4, 842:3, 843:1, 843:7, 843:22, 845:14, 845:20, 846:5, 847:8, 847:17, 848:16, 849:1, 849:7, 850:3, 850:5, 850:7, 851:12, 851:21, 852:2, 854:8, 855:21, 857:13, 858:13, 858:20, 858:22, 859:1, 859:15, 859:19, 865:9, 865:18, 866:5, 866:11, 867:8, 867:12, 868:7, 869:23, 871:23, 873:8, 873:16, 873:24, 876:16, 877:1, 877:20, 882:3, 884:5, 890:6, 890:8, 890:20, 892:1</p> <p><b>MIKSAD</b> [15] - 680:18, 702:12, 729:6, 731:1, 731:12, 752:14, 759:19, 760:11, 760:15, 816:17, 819:21, 829:4, 829:9, 869:23, 879:9</p> <p><b>Miksal/Mucci/ Colonna/ Rasmussen</b> [1] - 897:12</p> <p><b>Miksal/Mucci/ Ketschke/DeSanti</b> [1] - 897:1</p>	<p><b>Miksal</b> [8] - 769:2, 824:6, 827:21, 849:17, 850:8, 850:17, 852:9, 886:23</p> <p><b>Miksal's</b> [1] - 884:12</p> <p><b>miles</b> [3] - 692:20, 717:8, 717:9</p> <p><b>military</b> [1] - 747:23</p> <p><b>million</b> [46] - 686:21, 690:18, 710:20, 751:20, 778:6, 835:21, 870:10, 870:16, 870:22, 870:23, 879:19, 880:11, 882:15, 887:2, 887:5, 887:6, 887:8, 887:19, 887:22, 888:5, 888:6, 888:8, 888:10, 888:12, 888:13, 888:14, 888:24, 889:3, 889:18, 890:2, 891:16, 891:21, 891:23, 892:2, 892:5, 892:6, 892:8, 892:11, 892:12, 894:20, 894:21, 894:22</p> <p><b>mind</b> [10] - 691:18, 715:11, 715:19, 756:20, 756:21, 771:16, 803:3, 831:1, 876:11, 876:13</p> <p><b>minds</b> [2] - 770:13, 831:16</p> <p><b>mindset</b> [1] - 738:18</p> <p><b>minimized</b> [1] - 691:6</p> <p><b>minimizing</b> [1] - 821:9</p> <p><b>minimum</b> [2] - 785:23, 786:2</p> <p><b>minus</b> [7] - 684:13, 695:4, 695:7, 782:14, 824:7, 824:13, 824:15</p> <p><b>minute</b> [4] - 837:23, 845:7, 866:15</p> <p><b>minutes</b> [16] - 694:8, 714:5, 772:19, 795:6, 795:9, 801:3, 810:12, 836:6, 840:17, 841:10, 866:16, 866:19, 868:11, 880:15, 880:17, 895:22</p> <p><b>misaligned</b> [2] - 791:22, 793:1</p> <p><b>misinterpreted</b> [1] -</p>	<p>741:5</p> <p><b>misleading</b> [2] - 670:19, 760:7</p> <p><b>misnomer</b> [1] - 890:23</p> <p><b>missed</b> [1] - 790:23</p> <p><b>mission</b> [1] - 886:18</p> <p><b>mitigate</b> [2] - 799:13, 831:23</p> <p><b>mix</b> [2] - 676:2, 725:11</p> <p><b>mobilized</b> [1] - 716:5</p> <p><b>model</b> [16] - 731:21, 732:6, 735:16, 735:17, 735:18, 735:20, 736:9, 737:22, 738:9, 745:17, 785:10, 785:24, 786:1, 786:20</p> <p><b>modeling</b> [1] - 785:13</p> <p><b>modelling</b> [2] - 687:20, 775:11</p> <p><b>models</b> [1] - 732:19</p> <p><b>modern</b> [1] - 749:5</p> <p><b>modification</b> [1] - 764:22</p> <p><b>modifications</b> [1] - 701:8</p> <p><b>modified</b> [1] - 764:19</p> <p><b>modify</b> [1] - 764:16</p> <p><b>moment</b> [2] - 708:11, 810:4</p> <p><b>Monday</b> [15] - 692:6, 702:13, 702:21, 702:24, 703:5, 705:5, 705:23, 720:23, 733:9, 757:17, 757:18, 757:24, 859:6, 859:21, 867:23</p> <p><b>money</b> [7] - 749:17, 870:19, 871:2, 873:6, 887:13, 893:7, 894:15</p> <p><b>monitor</b> [1] - 860:14</p> <p><b>monitoring</b> [14] - 698:15, 712:5, 712:6, 721:14, 721:19, 744:3, 745:1, 745:15, 748:1, 783:10, 790:9, 858:3, 862:12, 862:13</p> <p><b>Monitoring</b> [1] - 783:11</p> <p><b>monitors</b> [1] - 862:13</p> <p><b>month</b> [7] - 726:7, 726:13, 727:14, 727:15, 728:9, 729:2, 751:17</p> <p><b>months</b> [7] - 687:1,</p>	<p>726:12, 727:15, 728:5, 728:12, 883:16, 883:22</p> <p><b>morning</b> [28] - 675:22, 676:18, 680:18, 691:16, 706:17, 707:23, 709:21, 715:4, 718:2, 718:24, 756:17, 757:5, 757:24, 758:18, 769:12, 769:21, 770:5, 770:12, 806:6, 806:19, 816:21, 833:21, 841:15, 867:21, 880:21, 895:13, 895:14, 896:5</p> <p><b>morning's</b> [2] - 680:1, 868:23</p> <p><b>Moshe</b> [2] - 668:23, 677:22</p> <p><b>most</b> [22] - 682:18, 682:19, 682:23, 693:9, 719:13, 725:5, 750:20, 752:16, 752:18, 762:20, 762:24, 766:3, 776:2, 777:9, 782:10, 805:24, 811:12, 828:5, 861:4, 861:24, 864:6, 877:4</p> <p><b>Most</b> [2] - 826:17, 864:24</p> <p><b>Mostly</b> [1] - 771:15</p> <p><b>mostly</b> [2] - 826:17, 864:4</p> <p><b>motion</b> [1] - 670:2</p> <p><b>Motion</b> [1] - 667:4</p> <p><b>motors</b> [5] - 817:21, 817:22, 818:21, 818:24</p> <p><b>move</b> [9] - 779:10, 788:16, 789:4, 800:8, 801:11, 807:1, 808:9, 856:15, 856:23</p> <p><b>moved</b> [4] - 768:1, 768:6, 807:10, 828:5</p> <p><b>movement</b> [1] - 704:6</p> <p><b>moving</b> [2] - 807:14, 862:9</p> <p><b>MR</b> [128] - 670:12, 673:19, 674:13, 676:22, 677:10, 677:13, 677:16, 677:21, 678:13, 678:18, 678:20, 678:24, 679:9,</p>
---	---	---	--	--

679:18, 680:18, 691:16, 702:12, 716:1, 717:12, 718:1, 729:6, 731:1, 731:12, 731:14, 731:16, 731:18, 731:19, 752:14, 754:4, 759:19, 760:11, 760:15, 760:17, 761:12, 761:15, 761:18, 762:6, 762:14, 762:18, 762:20, 763:6, 763:11, 763:12, 765:9, 766:23, 766:24, 767:1, 767:4, 767:14, 767:18, 767:20, 767:22, 768:7, 768:13, 768:14, 768:22, 778:12, 779:8, 779:14, 779:16, 785:16, 785:17, 789:4, 789:9, 792:22, 794:2, 794:3, 795:4, 795:7, 795:13, 798:23, 799:4, 804:9, 804:10, 805:1, 807:18, 807:19, 807:22, 808:2, 808:17, 808:21, 808:23, 814:20, 816:17, 819:21, 820:13, 822:3, 826:1, 828:22, 829:4, 829:9, 829:10, 845:10, 845:22, 846:17, 846:19, 849:10, 849:12, 849:15, 854:23, 855:3, 855:5, 855:6, 866:18, 866:22, 867:1, 867:15, 867:17, 867:18, 869:5, 869:13, 869:22, 869:23, 870:1, 870:3, 870:7, 870:8, 877:23, 878:12, 878:23, 879:2, 879:9, 880:17, 881:1, 886:7, 889:2, 892:10, 895:1 <b>MS</b> [12] - 672:3, 677:18, 678:11, 678:15, 717:20, 820:24, 822:6, 831:18, 838:3,	845:8, 846:15, 892:18 <b>MTA</b> [9] - 804:13, 807:18, 807:20, 807:23, 830:11, 843:21, 845:1, 845:12, 845:18 <b>Mucci</b> [87] - 680:6, 691:13, 717:23, 718:9, 718:17, 726:9, 731:23, 732:18, 735:21, 736:8, 736:23, 737:5, 738:3, 743:21, 744:14, 744:17, 744:21, 756:14, 758:16, 764:16, 765:6, 765:12, 766:9, 766:16, 766:19, 771:15, 772:5, 772:9, 775:5, 775:24, 776:9, 779:6, 780:3, 781:15, 781:18, 781:22, 783:11, 783:16, 784:15, 785:4, 785:13, 786:6, 786:19, 788:22, 789:3, 789:20, 790:11, 791:14, 791:24, 793:5, 793:22, 794:10, 794:17, 795:2, 796:4, 797:3, 798:13, 799:11, 800:8, 800:20, 804:6, 809:4, 810:1, 810:22, 812:10, 821:22, 822:9, 823:12, 824:10, 837:15, 838:11, 838:17, 839:4, 839:10, 844:7, 845:5, 846:23, 848:3, 848:7, 851:10, 852:21, 855:14, 856:6, 856:19, 857:9, 866:1, 870:1 <b>MUCCI</b> [9] - 691:16, 717:12, 762:14, 762:18, 766:23, 768:13, 792:22, 828:22, 870:1 <b>multiple</b> [21] - 681:5, 684:1, 685:15, 693:10, 711:23, 735:11, 735:12, 735:15, 735:23, 736:3, 736:16,	737:12, 772:11, 773:5, 774:21, 775:18, 823:13, 834:22, 841:20, 876:8 <b>MURPHY</b> [10] - 766:24, 767:4, 767:18, 768:14, 805:1, 807:19, 808:2, 808:21, 845:10, 845:22 <b>Murphy</b> [4] - 680:11, 766:23, 804:24, 845:5 <b>must</b> [1] - 801:22 <b>mutual</b> [1] - 716:15 <b>MVA</b> [3] - 718:15, 776:8, 776:12	<b>needed</b> [9] - 700:24, 702:7, 722:12, 745:11, 746:3, 770:6, 780:7, 809:5, 809:6 <b>needs</b> [7] - 701:5, 731:24, 833:7, 837:5, 842:19, 865:3, 866:20 <b>neighborhoods</b> [1] - 756:1 <b>neighboring</b> [2] - 861:21, 862:3 <b>net</b> [1] - 740:14 <b>Network</b> [1] - 680:3 <b>network</b> [285] - 670:4, 673:2, 680:21, 681:6, 681:8, 682:1, 682:6, 682:9, 682:10, 682:16, 683:2, 683:9, 683:10, 684:8, 684:12, 685:8, 688:21, 689:6, 689:12, 689:13, 689:16, 690:3, 690:10, 690:13, 690:14, 690:21, 691:5, 691:6, 691:8, 692:1, 692:21, 693:21, 693:22, 694:10, 695:18, 699:9, 699:11, 699:13, 700:6, 704:1, 704:23, 705:3, 706:7, 706:18, 706:21, 707:3, 707:10, 707:21, 708:3, 708:16, 708:19, 710:1, 710:2, 710:4, 710:7, 710:9, 710:10, 710:14, 710:18, 710:23, 711:1, 711:3, 711:7, 711:22, 712:11, 714:20, 715:17, 715:20, 715:21, 716:2, 716:19, 716:21, 717:5, 718:20, 718:21, 719:1, 720:4, 720:11, 722:6, 722:8, 722:10, 722:23, 723:1, 723:3, 723:5, 723:11, 723:14, 723:19, 724:2, 724:12, 724:20, 725:7, 725:15,	725:16, 725:21, 726:3, 726:4, 726:6, 726:7, 726:16, 726:18, 726:19, 727:6, 727:14, 728:8, 728:13, 728:17, 728:20, 729:16, 729:19, 730:23, 732:6, 732:13, 732:16, 734:3, 734:14, 738:13, 738:21, 739:1, 740:7, 740:20, 743:8, 744:6, 746:16, 748:14, 749:7, 751:8, 752:1, 752:3, 752:6, 756:23, 757:9, 758:13, 764:7, 764:11, 764:21, 767:5, 769:19, 770:4, 770:24, 771:10, 771:18, 773:12, 774:3, 777:3, 777:8, 777:9, 779:21, 780:9, 780:15, 780:20, 781:7, 781:9, 782:9, 782:16, 785:21, 785:22, 787:10, 788:19, 799:2, 799:13, 799:21, 800:1, 803:21, 803:22, 803:23, 804:12, 805:4, 805:5, 805:7, 805:9, 808:1, 808:11, 808:14, 808:15, 808:19, 808:24, 809:7, 810:2, 810:3, 810:8, 810:14, 810:17, 813:13, 813:24, 820:1, 824:1, 824:2, 824:17, 824:18, 825:23, 826:6, 826:9, 826:13, 826:14, 826:22, 830:9, 830:13, 830:15, 830:19, 830:24, 831:2, 831:12, 831:15, 833:24, 834:12, 835:13, 838:10, 838:19, 838:24, 839:6, 839:12, 839:24, 840:10, 840:11, 840:14, 841:1, 842:21, 842:24, 843:12,
<b>N</b>				
<b>name</b> [8] - 676:23, 718:18, 779:17, 783:24, 821:1, 826:2, 869:5, 890:23 <b>namely</b> [2] - 865:22, 874:16 <b>names</b> [1] - 869:20 <b>Nancy</b> [1] - 677:19 <b>natural</b> [1] - 705:6 <b>nature</b> [5] - 672:17, 673:13, 759:9, 842:18, 862:4 <b>near</b> [2] - 701:7, 847:3 <b>nearby</b> [3] - 746:1, 746:10, 746:11 <b>necessarily</b> [14] - 720:18, 754:9, 778:22, 778:23, 802:6, 806:2, 818:18, 820:8, 862:6, 878:3, 884:3, 884:5, 884:10, 891:6 <b>necessary</b> [4] - 804:5, 820:1, 865:24, 873:5 <b>need</b> [32] - 683:13, 687:22, 687:23, 687:24, 713:22, 723:14, 724:15, 734:1, 734:2, 735:24, 738:19, 752:22, 759:13, 764:13, 765:3, 780:14, 793:19, 802:17, 802:19, 809:9, 814:5, 814:7, 814:8, 831:19, 832:20, 834:19, 837:4, 837:5, 841:18, 857:18, 863:10, 884:6				

<p>843:24, 844:4, 845:3, 847:9, 849:18, 849:21, 850:20, 851:14, 852:16, 853:3, 853:12, 854:2, 856:12, 856:21, 856:23, 857:5, 857:10, 857:12, 858:3, 859:8, 860:1, 860:4, 861:10, 861:16, 862:5, 862:12, 862:14, 862:16, 863:15, 863:16, 863:21, 865:17, 870:14, 870:17, 870:20, 870:24, 871:2, 872:15, 873:21, 873:22, 875:2, 881:7, 881:10, 881:17, 881:21, 882:2, 882:7, 882:8, 882:17, 882:24, 884:15, 885:10, 886:16, 887:2, 892:22</p> <p><b>networks</b> [36] - 692:2, 696:15, 715:8, 715:12, 728:2, 730:11, 733:23, 735:14, 735:23, 736:22, 742:19, 742:24, 748:18, 767:17, 768:3, 768:20, 776:3, 776:19, 776:21, 781:12, 808:6, 814:15, 824:3, 824:6, 853:6, 881:12, 882:21, 883:10, 883:17, 883:23, 885:1, 885:4, 885:9, 885:16, 886:14</p> <p><b>neutral</b> [1] - 797:22</p> <p><b>Never</b> [1] - 851:21</p> <p><b>never</b> [7] - 700:1, 700:3, 757:8, 762:3, 762:8, 834:1, 851:20</p> <p><b>new</b> [24] - 717:9, 733:4, 748:21, 748:22, 750:5, 750:11, 777:16, 777:17, 779:11, 813:8, 813:11, 813:12, 813:18, 814:4, 814:15, 848:10, 853:23, 871:11, 871:12,</p>	<p>872:24, 873:3, 890:12, 894:8</p> <p><b>NEW</b> [1] - 667:1</p> <p><b>New</b> [47] - 667:5, 667:7, 667:11, 668:3, 668:4, 668:5, 668:9, 668:12, 668:15, 668:18, 668:19, 668:21, 668:24, 669:3, 669:6, 677:11, 677:16, 677:21, 677:23, 678:14, 679:21, 686:18, 686:23, 689:8, 689:18, 689:22, 691:6, 705:16, 711:4, 734:4, 767:8, 811:11, 817:9, 820:14, 824:5, 824:13, 829:2, 866:14, 867:19, 867:20, 874:18, 895:16</p> <p><b>Newell</b> [2] - 719:10, 755:21</p> <p><b>Newtown</b> [1] - 690:4</p> <p><b>next</b> [39] - 683:3, 688:6, 692:11, 693:17, 721:23, 723:10, 723:17, 724:1, 724:3, 731:6, 732:12, 732:14, 744:7, 749:4, 749:18, 750:8, 750:9, 759:1, 768:10, 773:2, 777:2, 793:16, 808:14, 811:2, 812:4, 812:8, 825:23, 839:13, 849:5, 873:1, 875:16, 880:4, 885:22, 885:23, 886:1, 886:2, 886:5, 886:22</p> <p><b>Next</b> [1] - 879:21</p> <p><b>nice</b> [1] - 792:17</p> <p><b>Nicholas</b> [1] - 869:9</p> <p><b>Nick</b> [2] - 869:5, 891:14</p> <p><b>night</b> [14] - 702:15, 705:7, 706:12, 709:2, 717:3, 718:7, 718:23, 722:19, 730:15, 766:4, 766:7, 769:11, 836:22, 867:23</p> <p><b>nightmare</b> [1] - 882:4</p> <p><b>nights</b> [1] - 836:20</p>	<p><b>nine</b> [5] - 717:9, 807:10, 833:24, 853:4, 894:22</p> <p><b>Nine</b> [2] - 742:1, 742:3</p> <p><b>ninth</b> [3] - 704:12, 719:12, 737:4</p> <p><b>nobody</b> [2] - 724:14, 724:15</p> <p><b>node</b> [4] - 773:21, 783:9, 796:7, 797:2</p> <p><b>nodes</b> [2] - 743:5, 784:14</p> <p><b>none</b> [5] - 676:14, 678:23, 708:10, 759:10, 763:18</p> <p><b>noon</b> [2] - 735:10, 896:2</p> <p><b>Norlander</b> [2] - 669:1, 678:14</p> <p><b>NORLANDER</b> [4] - 678:13, 866:18, 867:17, 867:18</p> <p><b>norm</b> [1] - 746:21</p> <p><b>normal</b> [10] - 728:8, 730:7, 762:12, 780:16, 788:1, 798:1, 801:14, 807:3, 838:23, 894:7</p> <p><b>normalized</b> [2] - 688:13, 689:1</p> <p><b>normally</b> [12] - 684:9, 696:23, 734:11, 739:5, 744:17, 800:16, 801:2, 808:19, 808:20, 838:23, 865:8, 893:9</p> <p><b>North</b> [1] - 681:23</p> <p><b>north</b> [11] - 681:24, 690:5, 690:16, 774:2, 789:10, 789:14, 805:3, 854:2, 865:10, 865:13, 866:6</p> <p><b>northeast</b> [2] - 689:8, 689:9</p> <p><b>northern</b> [1] - 716:7</p> <p><b>Northwest</b> [2] - 679:11, 679:23</p> <p><b>northwest</b> [1] - 690:3</p> <p><b>notable</b> [1] - 682:23</p> <p><b>note</b> [2] - 717:2, 820:13</p> <p><b>nothing</b> [2] - 758:8, 836:21</p> <p><b>notice</b> [1] - 854:14</p> <p><b>noticed</b> [1] - 836:15</p> <p><b>notification</b> [1] - 868:19</p> <p><b>notified</b> [2] - 768:23, 769:13</p>	<p><b>Number</b> [1] - 719:12</p> <p><b>number</b> [110] - 681:20, 682:4, 702:16, 705:15, 706:3, 706:8, 709:19, 711:9, 711:22, 712:23, 713:4, 718:4, 719:24, 720:1, 720:9, 723:6, 725:24, 727:1, 733:23, 734:17, 734:18, 740:1, 740:13, 740:20, 741:8, 741:10, 744:15, 750:19, 751:19, 759:13, 760:4, 761:1, 761:3, 761:19, 761:21, 763:16, 766:13, 767:7, 767:8, 768:4, 770:17, 771:24, 772:1, 772:3, 772:9, 772:22, 775:7, 776:16, 782:11, 782:15, 791:13, 809:5, 809:11, 812:17, 813:2, 817:6, 819:2, 822:18, 822:19, 822:20, 823:10, 823:13, 829:20, 832:19, 833:19, 835:22, 837:20, 838:9, 838:12, 838:23, 839:12, 843:22, 844:10, 844:17, 850:9, 851:4, 852:8, 852:18, 852:22, 853:5, 853:9, 853:15, 853:19, 858:1, 860:3, 863:1, 871:18, 871:19, 871:20, 872:11, 873:8, 873:19, 874:10, 875:8, 875:13, 876:8, 882:7, 882:10, 882:11, 883:1, 884:2, 884:7, 891:1, 891:9, 891:22</p> <p><b>numbers</b> [22] - 701:18, 709:14, 715:16, 743:14, 743:18, 763:11, 764:20, 768:8, 780:19, 811:14, 815:10, 822:22, 833:4, 835:20, 853:1, 862:23, 873:14, 879:18,</p>	<p>879:21, 881:15, 884:19, 891:13</p> <p><b>numerous</b> [2] - 807:24, 841:12</p> <p><b>nutshell</b> [1] - 693:16</p> <p><b>NYC</b> [1] - 668:20</p> <p><b>NYS</b> [6] - 668:2, 668:10, 668:11, 668:14, 668:16, 668:17</p> <p><b>NYSEG</b> [2] - 669:4, 678:18</p> <p><b>NYSERDA</b> [3] - 817:10, 820:14, 820:17</p>
<b>O</b>				
<p><b>O&amp;M</b> [12] - 870:19, 878:15, 887:6, 889:17, 889:20, 891:21, 892:7, 892:12, 893:14, 893:19, 893:20, 894:23</p> <p><b>oath</b> [1] - 672:11</p> <p><b>object</b> [1] - 821:4</p> <p><b>objection</b> [6] - 670:13, 670:17, 672:5, 675:21, 676:19, 676:20</p> <p><b>objections</b> [1] - 671:21</p> <p><b>objects</b> [1] - 671:8</p> <p><b>obligation</b> [1] - 675:19</p> <p><b>obtain</b> [1] - 843:16</p> <p><b>obvious</b> [2] - 834:7, 834:15</p> <p><b>obviously</b> [20] - 684:9, 687:4, 705:6, 711:10, 728:16, 736:21, 753:24, 764:13, 769:11, 769:14, 808:4, 808:9, 814:14, 820:3, 829:13, 834:18, 843:9, 858:2, 875:1, 893:10</p> <p><b>Obviously</b> [11] - 670:17, 686:17, 704:16, 709:2, 711:6, 714:16, 719:13, 751:11, 791:4, 843:7, 879:11</p> <p><b>occur</b> [8] - 729:23, 793:21, 797:12, 798:5, 800:19, 811:15, 841:12, 873:10</p> <p><b>occurred</b> [22] - 681:3, 704:9, 706:14,</p>				

<p>706:18, 724:2, 724:3, 729:6, 732:4, 740:3, 740:13, 769:4, 797:12, 797:13, 833:20, 841:10, 841:24, 846:6, 859:6, 864:6, 889:10</p> <p><b>occurrence</b> [2] - 775:4, 892:15</p> <p><b>occurrences</b> [1] - 695:23</p> <p><b>occurring</b> [7] - 702:14, 704:2, 705:23, 730:9, 841:17, 841:20, 865:1</p> <p><b>occurs</b> [8] - 687:10, 688:5, 700:5, 705:7, 727:12, 764:15, 816:20, 865:20</p> <p><b>October</b> [9] - 667:12, 670:5, 679:12, 687:10, 789:16, 847:20, 870:9, 887:1, 895:14</p> <p><b>odd</b> [1] - 758:21</p> <p><b>OEM</b> [18] - 757:15, 757:16, 757:20, 757:21, 758:2, 758:5, 758:6, 758:10, 758:13, 758:14, 759:12, 768:23, 769:13, 845:11, 845:16, 845:18, 846:11, 875:7</p> <p><b>OF</b> [1] - 667:1</p> <p><b>offering</b> [1] - 672:16</p> <p><b>offhand</b> [1] - 777:22</p> <p><b>Office</b> [5] - 668:10, 668:11, 668:14, 678:11, 838:5</p> <p><b>office</b> [4] - 675:16, 838:6, 846:3, 846:8</p> <p><b>offset</b> [2] - 701:10, 701:13</p> <p><b>offsets</b> [2] - 784:12, 785:12</p> <p><b>often</b> [6] - 689:6, 780:10, 811:5, 811:14, 876:14, 876:17</p> <p><b>Ohio</b> [1] - 716:14</p> <p><b>oil</b> [4] - 696:8, 718:10, 742:5, 745:18</p> <p><b>old</b> [3] - 750:12, 821:21, 822:8</p> <p><b>once</b> [15] - 682:12, 689:4, 710:6, 712:6,</p>	<p>744:1, 769:11, 769:12, 770:4, 772:10, 774:5, 783:6, 829:15, 875:16, 876:16</p> <p><b>Once</b> [2] - 683:11, 683:19</p> <p><b>One</b> [27] - 669:5, 697:21, 713:2, 725:7, 726:23, 731:20, 738:12, 745:2, 745:14, 746:14, 746:23, 749:9, 765:21, 772:10, 772:19, 775:24, 780:4, 801:20, 811:20, 826:15, 831:9, 846:5, 848:8, 849:3, 867:17, 872:3, 882:3</p> <p><b>one</b> [137] - 671:21, 674:19, 677:3, 678:2, 678:3, 681:13, 682:7, 682:23, 683:20, 688:17, 690:11, 691:24, 695:23, 696:7, 697:4, 697:10, 699:21, 699:24, 702:18, 702:19, 705:12, 709:16, 709:19, 711:6, 711:13, 712:19, 713:5, 713:6, 713:12, 715:8, 718:20, 720:6, 720:12, 720:15, 725:6, 725:10, 725:13, 726:23, 730:14, 731:3, 738:10, 742:14, 747:23, 750:5, 751:2, 751:3, 754:17, 758:21, 758:24, 764:9, 764:15, 771:16, 771:20, 773:7, 773:9, 773:10, 773:18, 774:2, 775:1, 780:14, 781:6, 785:19, 785:23, 786:24, 787:14, 788:20, 790:7, 790:8, 790:11, 790:17, 790:19, 791:2, 791:9, 791:16, 792:22, 794:4, 795:19, 797:13, 797:21, 798:11, 803:17, 805:2,</p>	<p>807:17, 809:11, 811:9, 811:11, 811:13, 813:19, 814:21, 815:16, 815:19, 819:22, 823:2, 823:12, 827:11, 827:12, 827:19, 827:24, 828:2, 828:12, 828:18, 828:20, 829:5, 832:22, 833:11, 833:19, 834:10, 840:12, 844:24, 847:9, 849:4, 849:20, 850:15, 850:17, 850:18, 851:12, 853:18, 854:1, 861:20, 863:3, 868:10, 874:8, 877:4, 877:5, 880:9, 885:4, 885:11, 885:14, 886:2, 891:22, 893:21, 895:16, 895:24</p> <p><b>one's</b> [1] - 832:23</p> <p><b>ones</b> [6] - 743:13, 745:12, 768:12, 824:19, 833:23, 876:12</p> <p><b>ongoing</b> [2] - 730:8, 743:1</p> <p><b>op</b> [1] - 827:16</p> <p><b>open</b> [39] - 696:23, 697:13, 698:21, 698:23, 698:24, 700:11, 746:17, 759:4, 771:22, 772:2, 772:7, 773:13, 774:14, 775:4, 775:19, 775:21, 776:17, 780:10, 780:15, 780:20, 781:15, 782:4, 784:8, 784:9, 792:14, 793:11, 793:12, 795:16, 795:18, 796:24, 797:1, 798:8, 799:8, 808:20, 809:11, 809:19, 810:2, 847:19, 891:9</p> <p><b>opened</b> [8] - 694:8, 699:21, 716:7, 755:10, 755:17, 756:15, 757:19, 774:6</p> <p><b>opening</b> [1] - 760:7</p> <p><b>opens</b> [2] - 697:3, 697:4</p>	<p><b>operate</b> [20] - 697:2, 697:9, 698:7, 698:13, 738:14, 739:3, 744:15, 747:14, 785:23, 785:24, 787:3, 787:11, 789:11, 789:13, 791:12, 791:19, 848:17, 853:8, 853:12, 857:23</p> <p><b>operated</b> [9] - 698:12, 733:10, 735:22, 738:10, 774:10, 786:13, 791:18, 808:19, 853:7</p> <p><b>operates</b> [1] - 780:16</p> <p><b>operating</b> [13] - 687:4, 725:12, 728:13, 740:8, 755:14, 759:2, 782:20, 853:1, 853:2, 869:7, 881:3, 881:5, 883:5</p> <p><b>operation</b> [10] - 680:10, 680:19, 735:15, 788:7, 798:1, 801:15, 801:24, 830:24, 849:22, 866:14</p> <p><b>operational</b> [2] - 731:21, 746:20</p> <p><b>Operations</b> [1] - 724:18</p> <p><b>operations</b> [4] - 680:6, 681:4, 807:3, 869:24</p> <p><b>operative</b> [1] - 803:3</p> <p><b>operator</b> [14] - 698:10, 699:1, 702:10, 703:17, 707:2, 713:7, 739:20, 774:9, 790:5, 791:2, 801:8, 829:23, 835:9, 835:11</p> <p><b>Operator</b> [4] - 699:2, 705:17, 817:9, 818:3</p> <p><b>operator's</b> [3] - 693:6, 715:11, 715:19</p> <p><b>Operators</b> [4] - 698:7, 704:17, 735:2, 791:5</p> <p><b>operators</b> [33] - 693:8, 699:14, 702:7, 703:5, 703:12, 703:24, 705:11, 707:15, 707:19, 708:5, 708:18, 710:13, 711:2, 732:15, 732:22, 735:1, 736:14, 738:7, 772:23, 787:22, 788:3,</p>	<p>790:14, 802:13, 802:21, 815:2, 834:10, 834:21, 842:7, 853:4, 859:4, 859:9, 868:20, 875:19</p> <p><b>opinion</b> [3] - 671:6, 725:10, 836:1</p> <p><b>opinions</b> [2] - 671:2, 841:11</p> <p><b>opportunity</b> [3] - 676:10, 769:9, 806:4</p> <p><b>opposed</b> [3] - 730:22, 752:12, 827:10</p> <p><b>opposite</b> [3] - 671:6, 739:4, 739:5</p> <p><b>oranges</b> [1] - 811:17</p> <p><b>ordering</b> [29] - 687:18, 688:1, 704:19, 733:24, 736:1, 736:12, 753:8, 756:17, 760:3, 766:14, 766:17, 767:2, 767:11, 767:16, 775:3, 775:17, 779:13, 809:7, 827:10, 830:10, 834:11, 834:12, 850:16, 868:14, 881:20, 884:8, 884:14, 884:23, 892:2</p> <p><b>ordered</b> [1] - 819:14</p> <p><b>organization</b> [3] - 730:7, 763:14, 876:1</p> <p><b>organizational</b> [1] - 878:18</p> <p><b>organizations</b> [2] - 687:21, 755:14</p> <p><b>original</b> [2] - 794:14, 851:24</p> <p><b>OSHA</b> [1] - 880:1</p> <p><b>ourselves</b> [3] - 688:6, 829:1, 839:20</p> <p><b>outage</b> [41] - 688:17, 689:7, 691:4, 695:8, 713:21, 714:2, 720:19, 751:15, 751:18, 751:23, 752:7, 752:10, 753:20, 756:19, 759:18, 759:21, 760:1, 760:9, 763:1, 816:5, 819:20, 821:5, 821:8, 822:11, 822:22, 822:23, 824:18, 827:17, 829:8, 837:10, 850:24, 851:8, 851:17,</p>
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<p>855:20, 859:22, 862:19, 892:14, 892:16, 893:3 <b>Outage</b> [1] - 667:5 <b>outages</b> [37] - 670:3, 688:19, 689:11, 707:11, 712:23, 714:13, 715:13, 715:14, 715:20, 722:21, 728:9, 728:12, 728:15, 729:14, 757:14, 763:22, 764:21, 769:16, 769:22, 770:15, 771:3, 814:14, 815:7, 815:14, 835:1, 835:11, 842:1, 850:23, 851:8, 851:13, 851:18, 856:1, 860:5, 862:20, 862:24 <b>Outages</b> [3] - 667:8, 679:11, 679:22 <b>outdated</b> [1] - 733:6 <b>outlet</b> [1] - 872:8 <b>outlets</b> [2] - 682:14, 711:18 <b>outline</b> [1] - 889:23 <b>outlined</b> [3] - 681:9, 690:1, 866:12 <b>outlines</b> [1] - 874:5 <b>outlying</b> [1] - 817:20 <b>outside</b> [4] - 699:9, 757:14, 765:4, 839:15 <b>overall</b> [2] - 728:17, 876:18 <b>overcome</b> [2] - 774:19, 835:19 <b>overcurrent</b> [4] - 698:23, 700:22, 784:5, 797:5 <b>overhead</b> [8] - 684:24, 688:22, 689:16, 711:13, 712:22, 873:22, 873:24, 874:23 <b>overheats</b> [1] - 693:2 <b>overlaid</b> [1] - 685:10 <b>overload</b> [6] - 696:22, 707:13, 709:16, 737:10, 742:10, 744:11 <b>overloaded</b> [10] - 692:22, 707:6, 708:11, 708:13, 709:17, 718:7, 718:8, 718:9, 737:24, 800:7</p>	<p><b>overloading</b> [1] - 727:11 <b>overloads</b> [5] - 737:7, 737:18, 737:20, 737:21, 800:5 <b>overly</b> [1] - 882:5 <b>overriding</b> [1] - 801:14 <b>override</b> [1] - 675:21 <b>oversize</b> [1] - 860:9 <b>oversized</b> [1] - 861:22 <b>overview</b> [4] - 680:21, 681:1, 686:14, 719:5 <b>own</b> [11] - 693:14, 716:8, 734:13, 734:15, 737:1, 741:5, 763:15, 764:3, 807:16, 815:23, 866:3 <b>owned</b> [1] - 866:4</p>	<p>874:7, 874:8, 895:8 <b>participate</b> [1] - 877:8 <b>participated</b> [1] - 677:3 <b>particular</b> [34] - 676:4, 676:9, 693:21, 694:19, 696:20, 697:1, 698:13, 700:21, 700:22, 711:3, 711:4, 714:17, 734:3, 751:7, 771:20, 800:5, 817:15, 819:24, 823:2, 823:17, 824:11, 826:15, 828:24, 830:1, 842:14, 856:21, 857:4, 872:4, 874:10, 875:2, 882:4, 882:6, 882:12, 890:3 <b>particularly</b> [10] - 714:4, 716:19, 746:10, 769:21, 804:13, 818:1, 864:23, 873:21, 883:7, 893:6 <b>Particularly</b> [1] - 734:8 <b>parties</b> [18] - 670:20, 671:18, 672:8, 672:13, 674:5, 674:16, 675:4, 675:15, 676:9, 676:19, 679:12, 769:14, 822:4, 843:10, 849:24, 880:13, 895:11, 895:24 <b>parties'</b> [3] - 671:9, 819:13 <b>parts</b> [5] - 752:14, 822:14, 874:6, 874:22, 876:18 <b>party</b> [4] - 675:24, 676:6, 677:5, 822:3 <b>party's</b> [1] - 672:22 <b>pass</b> [6] - 710:18, 710:22, 737:17, 785:5, 800:24, 825:13 <b>passes</b> [1] - 825:15 <b>passing</b> [1] - 878:7 <b>past</b> [8] - 686:22, 731:13, 733:20, 735:22, 776:17, 851:7, 876:7, 881:11 <b>patent</b> [1] - 853:21 <b>patents</b> [6] - 748:2, 748:9, 748:20, 854:6, 854:8, 854:9</p>	<p><b>path</b> [9] - 682:24, 685:3, 685:6, 698:19, 711:13, 790:13, 865:7, 867:12 <b>paths</b> [3] - 682:5, 711:23 <b>pathway</b> [1] - 847:5 <b>patience</b> [1] - 895:12 <b>patient</b> [1] - 854:19 <b>Patrick</b> [1] - 826:2 <b>pattern</b> [1] - 759:16 <b>patterns</b> [1] - 833:12 <b>pay</b> [2] - 817:17, 820:15 <b>paying</b> [1] - 769:4 <b>PD</b> [1] - 805:16 <b>peak</b> [20] - 684:12, 684:15, 687:6, 687:7, 690:17, 700:7, 700:9, 705:2, 706:10, 734:20, 734:21, 780:13, 797:8, 810:11, 810:17, 812:4, 812:12, 812:13, 812:20 <b>Peck</b> [1] - 678:4 <b>penalties</b> [1] - 818:10 <b>People</b> [8] - 669:7, 678:16, 760:23, 820:23, 821:3, 826:3, 844:14, 895:17 <b>people</b> [59] - 670:9, 678:5, 710:20, 715:3, 724:11, 733:2, 737:2, 756:22, 757:1, 757:3, 757:7, 757:10, 760:8, 760:17, 760:22, 761:6, 761:7, 762:2, 762:22, 763:14, 770:14, 770:19, 784:11, 785:6, 797:23, 804:8, 821:7, 821:13, 822:19, 822:20, 823:10, 823:13, 823:16, 823:17, 823:21, 823:22, 827:19, 828:20, 828:21, 828:23, 829:6, 829:8, 831:14, 832:7, 832:9, 832:19, 834:14, 836:16, 844:8, 844:16, 845:7, 854:21,</p>	<p>860:7, 860:13, 865:1, 875:14, 878:1 <b>people's</b> [1] - 823:15 <b>People.....821</b> [1] - 897:5 <b>per</b> [7] - 680:23, 689:2, 754:19, 829:6, 881:20, 883:4, 885:9 <b>perceiving</b> [2] - 831:20, 832:4 <b>percent</b> [46] - 671:6, 706:2, 709:16, 709:19, 717:3, 725:19, 725:21, 725:24, 743:17, 743:19, 746:20, 746:21, 746:23, 746:24, 747:1, 748:17, 750:22, 760:21, 761:14, 762:21, 765:24, 777:23, 779:4, 779:24, 791:24, 799:15, 799:16, 800:14, 812:23, 812:24, 825:10, 825:20, 852:6, 852:7, 852:18, 853:1, 853:2, 853:9, 853:13, 853:18, 859:13, 859:14, 870:23, 871:18, 891:23 <b>percentage</b> [6] - 709:15, 778:5, 779:7, 782:8, 786:4, 847:10 <b>perfect</b> [2] - 736:10, 792:6 <b>perfectly</b> [1] - 792:4 <b>Performance</b> [2] - 667:4, 667:7 <b>performance</b> [6] - 691:12, 814:11, 837:17, 837:18, 886:16, 886:21 <b>performed</b> [1] - 803:5 <b>perhaps</b> [5] - 710:20, 750:5, 760:7, 781:11, 814:17 <b>Perhaps</b> [1] - 827:14 <b>period</b> [43] - 686:17, 687:16, 692:5, 702:11, 703:22, 704:14, 704:20, 713:13, 713:16, 716:19, 723:16, 728:5, 728:12, 747:16, 757:23,</p>
<b>P</b>				
	<p><b>p.m</b> [2] - 708:8, 734:22 <b>package</b> [1] - 815:16 <b>packages</b> [1] - 770:3 <b>page</b> [8] - 785:20, 786:9, 789:15, 790:6, 795:16, 795:22, 800:11, 847:19 <b>paid</b> [1] - 818:7 <b>panel</b> [17] - 672:6, 672:18, 673:5, 676:16, 676:18, 719:4, 868:23, 869:18, 871:24, 879:6, 880:21, 895:4, 895:20, 895:23, 896:1, 897:1, 897:12 <b>Panel</b> [1] - 717:23 <b>panelists</b> [1] - 670:18 <b>paper</b> [3] - 778:20, 871:8, 878:19 <b>parallel</b> [4] - 682:5, 749:4, 775:1, 777:19 <b>parent</b> [1] - 845:1 <b>Park</b> [1] - 838:24 <b>parked</b> [1] - 833:9 <b>Part</b> [1] - 679:20 <b>part</b> [18] - 695:22, 724:14, 727:13, 740:16, 747:24, 751:4, 770:5, 799:24, 815:4, 817:2, 817:5, 819:10, 821:2, 830:7, 844:7, 873:4, 884:3, 884:4 <b>participants</b> [3] -</p>			

<p>783:1, 809:23, 820:21, 830:22, 841:17, 854:12, 854:16, 855:7, 870:16, 870:18, 870:21, 871:3, 871:6, 879:17, 880:6, 883:8, 883:16, 885:20, 886:12, 886:13, 886:14, 887:9, 887:10, 889:7, 891:21, 892:9, 892:22, 893:20</p> <p><b>periodic</b> [1] - 755:12</p> <p><b>periods</b> [1] - 706:12</p> <p><b>permission</b> [1] - 806:21</p> <p><b>person</b> [6] - 680:15, 752:19, 760:14, 828:10, 842:1, 852:17</p> <p><b>person's</b> [1] - 752:22</p> <p><b>personnel</b> [1] - 716:11</p> <p><b>persons</b> [1] - 842:1</p> <p><b>perspective</b> [16] - 688:9, 711:21, 712:4, 719:5, 719:8, 720:5, 721:4, 756:10, 769:10, 809:24, 836:13, 892:13, 892:14, 893:1, 893:5, 893:13</p> <p><b>perspectives</b> [1] - 719:3</p> <p><b>phase</b> [10] - 687:17, 775:14, 785:24, 786:1, 786:13, 787:7, 787:18, 788:2, 788:7, 849:4</p> <p><b>phased</b> [1] - 787:23</p> <p><b>phases</b> [1] - 786:2</p> <p><b>phenomena</b> [1] - 784:10</p> <p><b>phenomenon</b> [2] - 785:11, 798:5</p> <p><b>phone</b> [15] - 712:17, 713:17, 749:16, 749:17, 749:22, 761:1, 761:3, 761:19, 761:21, 763:8, 763:9, 835:17, 845:23, 866:16</p> <p><b>phones</b> [1] - 749:23</p> <p><b>physics</b> [1] - 740:10</p> <p><b>pl</b> [5] - 737:5, 737:23, 738:3, 802:11, 829:22</p> <p><b>pick</b> [13] - 692:16,</p>	<p>746:1, 753:1, 809:21, 839:17, 847:5, 847:9, 847:13, 848:15, 849:6, 879:5, 880:21, 895:13</p> <p><b>picking</b> [3] - 712:17, 753:10, 847:6</p> <p><b>picture</b> [8] - 685:16, 709:23, 738:23, 758:8, 758:12, 817:2, 819:10, 852:24</p> <p><b>piece</b> [10] - 703:11, 723:22, 723:23, 745:17, 745:19, 745:21, 746:3, 762:1, 782:21, 865:14</p> <p><b>pieced</b> [1] - 758:8</p> <p><b>pieces</b> [3] - 745:24, 758:7, 821:13</p> <p><b>plggy</b> [1] - 738:24</p> <p><b>pink</b> [1] - 880:1</p> <p><b>Place</b> [2] - 668:8, 755:12</p> <p><b>place</b> [18] - 670:7, 678:4, 678:24, 718:23, 742:23, 744:8, 748:23, 748:24, 752:16, 763:24, 793:16, 817:7, 819:2, 824:19, 850:2, 875:11, 885:22, 894:12</p> <p><b>places</b> [5] - 688:24, 751:13, 752:17, 752:18, 835:18</p> <p><b>placing</b> [1] - 676:12</p> <p><b>plan</b> [32] - 680:23, 681:9, 713:12, 717:13, 754:21, 777:1, 785:13, 815:4, 820:20, 874:2, 874:5, 874:6, 874:9, 874:16, 874:24, 875:1, 875:5, 875:7, 875:8, 875:12, 875:14, 875:17, 876:18, 886:15, 889:11, 893:14, 894:9</p> <p><b>planned</b> [1] - 793:16</p> <p><b>planning</b> [11] - 680:7, 782:17, 782:18, 812:4, 833:12, 835:22, 869:6, 870:2, 874:1, 874:3, 876:16</p>	<p><b>plans</b> [16] - 701:8, 754:9, 778:16, 782:13, 785:9, 793:1, 817:14, 823:8, 823:9, 823:10, 833:13, 833:14, 874:19, 875:11, 876:11, 876:15</p> <p><b>plant</b> [3] - 734:15, 807:12, 843:15</p> <p><b>plants</b> [2] - 866:1, 866:8</p> <p><b>plate</b> [1] - 718:18</p> <p><b>plateau</b> [1] - 703:21</p> <p><b>platform</b> [2] - 749:13, 749:24</p> <p><b>play</b> [1] - 739:12</p> <p><b>played</b> [1] - 764:12</p> <p><b>Plaza</b> [3] - 668:3, 668:18, 669:5</p> <p><b>plead</b> [1] - 671:22</p> <p><b>plot</b> [4] - 769:15, 769:18, 769:21, 770:2</p> <p><b>Plotkin</b> [1] - 677:20</p> <p><b>plotted</b> [3] - 769:16, 815:7, 815:15</p> <p><b>plotting</b> [1] - 770:5</p> <p><b>plug</b> [1] - 823:4</p> <p><b>Plus</b> [1] - 866:2</p> <p><b>plus</b> [1] - 688:2</p> <p><b>PO</b> [1] - 668:24</p> <p><b>pocket</b> [7] - 782:23, 858:19, 858:24, 865:6, 865:7, 867:7, 867:8</p> <p><b>pockets</b> [1] - 867:3</p> <p><b>point</b> [82] - 672:13, 674:2, 674:12, 676:10, 677:8, 686:13, 687:17, 699:4, 699:6, 700:5, 702:7, 702:15, 703:22, 704:14, 705:5, 706:5, 707:8, 708:17, 709:16, 709:17, 709:18, 709:20, 715:8, 718:8, 720:24, 722:18, 722:19, 724:9, 724:10, 725:9, 725:11, 726:10, 726:11, 735:3, 735:13, 737:10, 740:19, 745:2, 756:19, 758:1, 761:1, 762:14, 764:16, 766:3, 769:15,</p>	<p>769:18, 770:12, 770:22, 779:1, 780:5, 787:21, 788:22, 789:2, 791:9, 794:11, 797:10, 798:6, 825:7, 827:12, 830:2, 830:8, 835:16, 840:3, 841:1, 842:17, 844:12, 846:20, 852:21, 855:22, 855:23, 856:13, 858:6, 861:9, 862:12, 862:13, 862:19, 863:24, 868:4, 882:3, 894:10, 894:13</p> <p><b>Point</b> [1] - 866:5</p> <p><b>pointer</b> [1] - 783:23</p> <p><b>pointers</b> [1] - 733:6</p> <p><b>pointing</b> [1] - 733:6</p> <p><b>points</b> [3] - 750:13, 841:5, 861:3</p> <p><b>police</b> [2] - 719:22, 720:13</p> <p><b>Police</b> [1] - 706:5</p> <p><b>policy</b> [1] - 728:13</p> <p><b>poll</b> [1] - 823:11</p> <p><b>pollution</b> [2] - 807:11, 843:15</p> <p><b>poor</b> [1] - 863:6</p> <p><b>port</b> [2] - 763:22, 830:3</p> <p><b>Port</b> [3] - 805:12, 805:19, 805:24</p> <p><b>portfolio</b> [2] - 674:19, 817:5</p> <p><b>portion</b> [10] - 722:24, 727:11, 777:9, 781:1, 781:2, 781:4, 792:7, 847:1, 874:23, 880:20</p> <p><b>portions</b> [5] - 777:12, 777:17, 824:17, 826:22</p> <p><b>pose</b> [1] - 880:14</p> <p><b>posed</b> [1] - 809:24</p> <p><b>position</b> [4] - 670:8, 750:7, 810:2, 830:12</p> <p><b>positive</b> [1] - 703:15</p> <p><b>possibilities</b> [1] - 724:4</p> <p><b>possibility</b> [1] - 746:16</p> <p><b>possible</b> [12] - 693:8, 699:15, 702:8, 704:19, 716:24, 772:12, 784:12, 785:9, 824:9,</p>	<p>824:10, 846:18, 876:2</p> <p><b>possibly</b> [5] - 718:15, 720:19, 746:14, 766:3, 894:1</p> <p><b>Post</b> [1] - 762:7</p> <p><b>post</b> [14] - 719:4, 719:9, 722:4, 725:4, 725:5, 740:3, 757:17, 757:22, 757:23, 762:12, 841:21, 845:11, 846:3, 846:8</p> <p><b>postponed</b> [2] - 820:1, 820:2</p> <p><b>pot</b> [1] - 795:24</p> <p><b>potential</b> [5] - 670:21, 780:23, 793:6, 819:20, 843:24</p> <p><b>potentially</b> [1] - 837:8</p> <p><b>pots</b> [2] - 796:12, 847:22</p> <p><b>pounds</b> [1] - 697:14</p> <p><b>Power</b> [10] - 669:7, 678:16, 678:20, 679:11, 679:22, 820:23, 821:3, 826:2, 895:17, 897:5</p> <p><b>power</b> [30] - 682:2, 682:14, 683:13, 695:16, 739:3, 739:4, 739:6, 739:10, 745:5, 747:9, 749:14, 753:20, 757:3, 760:2, 773:21, 803:13, 808:9, 822:12, 829:14, 830:8, 842:19, 846:20, 848:18, 849:4, 849:5, 858:23, 859:20, 863:17, 866:1, 866:8</p> <p><b>PQ</b> [4] - 783:9, 784:14, 796:7, 797:2</p> <p><b>PQ-node</b> [2] - 796:7, 797:2</p> <p><b>practice</b> [1] - 874:12</p> <p><b>practices</b> [1] - 853:10</p> <p><b>pre</b> [2] - 741:24, 805:13</p> <p><b>pre-event</b> [1] - 741:24</p> <p><b>pre-summer</b> [1] - 805:13</p> <p><b>precise</b> [1] - 768:11</p> <p><b>preclude</b> [1] - 788:20</p> <p><b>predict</b> [2] - 732:12, 840:19</p> <p><b>predictive</b> [1] - 788:24</p> <p><b>predominantly</b> [1] -</p>
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<p>696:4</p> <p><b>preemptive</b> [1] - 800:8</p> <p><b>preferred</b> [1] - 852:7</p> <p><b>preliminary</b> [1] - 670:6</p> <p><b>Preparation</b> [1] - 679:22</p> <p><b>preparation</b> [7] - 681:2, 816:6, 816:7, 873:7, 874:3, 876:22, 886:7</p> <p><b>prepare</b> [2] - 688:6, 798:11</p> <p><b>prepared</b> [2] - 679:13, 879:11</p> <p><b>preparedness</b> [5] - 874:15, 876:10, 877:4, 877:6, 877:17</p> <p><b>present</b> [3] - 673:21, 783:12, 878:16</p> <p><b>presentable</b> [1] - 685:17</p> <p><b>presentation</b> [17] - 674:1, 676:15, 679:1, 680:1, 680:20, 718:4, 729:8, 789:21, 790:7, 790:15, 818:5, 830:8, 832:3, 840:23, 879:11, 880:12, 880:14</p> <p><b>presentations</b> [3] - 671:11, 671:12, 679:8</p> <p><b>presenters</b> [1] - 675:23</p> <p><b>preserve</b> [1] - 863:22</p> <p><b>president</b> [13] - 677:23, 680:6, 680:7, 680:8, 680:19, 719:10, 755:21, 842:4, 845:15, 849:20, 869:23, 870:1, 870:3</p> <p><b>PRESIDING</b> [1] - 667:14</p> <p><b>presiding</b> [1] - 676:24</p> <p><b>press</b> [3] - 712:19, 796:16, 886:24</p> <p><b>presses</b> [1] - 801:8</p> <p><b>pressure</b> [3] - 742:9, 742:13, 792:16</p> <p><b>presume</b> [1] - 770:19</p> <p><b>presumption</b> [1] - 858:10</p> <p><b>pretty</b> [4] - 749:23, 768:10, 776:11, 844:12</p> <p><b>prevent</b> [3] - 693:9, 743:4, 837:21</p> <p><b>prevention</b> [1] - 743:2</p>	<p><b>previous</b> [11] - 683:8, 685:21, 686:12, 691:11, 709:14, 714:11, 749:21, 775:20, 815:24, 826:5, 838:13</p> <p><b>previously</b> [6] - 698:12, 714:6, 747:5, 762:9, 798:22, 872:16</p> <p><b>pride</b> [3] - 831:10, 837:17</p> <p><b>primarily</b> [7] - 701:12, 722:16, 722:21, 747:22, 771:2, 859:24, 881:2</p> <p><b>Primary</b> [3] - 724:24, 732:7, 737:8</p> <p><b>primary</b> [59] - 683:5, 683:16, 685:12, 685:22, 686:6, 692:17, 693:2, 693:10, 693:18, 693:19, 694:5, 694:7, 694:11, 694:20, 694:22, 695:14, 696:9, 696:16, 696:18, 701:20, 707:5, 707:6, 708:9, 722:17, 722:24, 723:2, 724:22, 735:18, 737:7, 737:11, 737:16, 737:18, 737:19, 737:21, 737:24, 738:2, 738:3, 745:14, 745:22, 770:21, 770:23, 771:3, 771:6, 778:19, 779:5, 779:6, 788:16, 820:13, 838:9, 839:19, 840:1, 840:5, 871:6, 871:8, 872:23, 881:16, 882:16</p> <p><b>principally</b> [1] - 724:22</p> <p><b>print</b> [1] - 829:4</p> <p><b>prioritize</b> [2] - 745:21, 886:22</p> <p><b>priority</b> [1] - 783:2</p> <p><b>privacy</b> [1] - 823:15</p> <p><b>privy</b> [1] - 845:12</p> <p><b>proactive</b> [1] - 778:18</p> <p><b>proactively</b> [1] - 872:15</p> <p><b>probability</b> [9] - 692:10, 818:12,</p>	<p>837:22, 839:13, 839:14, 839:16, 855:8, 855:20, 855:24</p> <p><b>probe</b> [1] - 842:16</p> <p><b>problem</b> [19] - 695:10, 699:2, 699:3, 699:20, 700:2, 703:2, 712:13, 712:18, 712:20, 712:21, 733:3, 782:2, 793:7, 796:16, 797:24, 843:18, 847:23, 848:4</p> <p><b>problematic</b> [2] - 745:12, 810:10</p> <p><b>problems</b> [10] - 702:4, 720:16, 741:15, 744:5, 754:5, 754:7, 763:16, 793:4, 806:8, 860:8</p> <p><b>procedure</b> [3] - 676:14, 842:3, 849:22</p> <p><b>procedures</b> [2] - 727:1, 875:22</p> <p><b>proceed</b> [4] - 676:15, 869:20, 870:6, 880:24</p> <p><b>proceeded</b> [3] - 714:18, 731:6, 749:6</p> <p><b>proceeding</b> [10] - 670:2, 670:21, 672:5, 673:6, 673:8, 673:15, 674:4, 674:20, 683:23, 822:3</p> <p><b>Proceeding</b> [1] - 667:4</p> <p><b>proceedings</b> [4] - 673:13, 675:5, 675:8, 677:4</p> <p><b>process</b> [30] - 670:23, 673:4, 673:11, 676:2, 686:15, 687:20, 703:6, 703:7, 703:16, 712:15, 713:23, 714:1, 714:5, 714:6, 714:8, 714:11, 714:13, 727:15, 754:18, 755:24, 762:13, 770:6, 772:2, 796:15, 796:19, 806:23, 850:1, 885:7, 885:11, 885:14</p> <p><b>processes</b> [1] - 885:18</p>	<p><b>processing</b> [4] - 739:18, 761:1, 876:5, 884:9</p> <p><b>produced</b> [1] - 785:1</p> <p><b>product</b> [1] - 735:5</p> <p><b>productive</b> [2] - 854:20, 895:9</p> <p><b>profitable</b> [1] - 748:12</p> <p><b>program</b> [27] - 705:18, 705:20, 729:22, 732:12, 733:5, 744:1, 749:3, 749:9, 751:18, 751:21, 752:15, 752:16, 763:22, 764:2, 778:18, 794:20, 794:22, 818:2, 818:9, 818:17, 826:7, 835:24, 867:21, 872:14, 873:5, 890:15, 890:16</p> <p><b>programs</b> [33] - 705:19, 743:1, 743:24, 744:2, 744:8, 782:14, 814:14, 817:6, 817:9, 817:10, 817:11, 817:13, 818:4, 819:2, 819:8, 819:15, 819:23, 820:16, 820:19, 826:10, 826:11, 826:18, 844:21, 844:22, 868:17, 868:19, 872:12, 872:20, 873:3, 890:14</p> <p><b>progress</b> [2] - 717:2, 819:9</p> <p><b>progressed</b> [1] - 771:9</p> <p><b>project</b> [6] - 750:10, 765:17, 774:18, 883:2, 893:8</p> <p><b>Project</b> [3] - 669:1, 669:2, 678:14</p> <p><b>projected</b> [8] - 745:18, 765:19, 812:8, 812:12, 879:18, 880:7, 888:2</p> <p><b>projecting</b> [1] - 892:5</p> <p><b>projection</b> [1] - 745:20</p> <p><b>projects</b> [1] - 872:24</p> <p><b>prompt</b> [1] - 720:4</p> <p><b>properly</b> [2] - 733:14, 771:14</p> <p><b>property</b> [3] - 865:14, 866:2, 881:19</p> <p><b>proposed</b> [3] - 674:14, 680:24, 814:6</p>	<p><b>proprietary</b> [1] - 748:1</p> <p><b>prospect</b> [1] - 709:7</p> <p><b>prospects</b> [1] - 708:2</p> <p><b>protect</b> [2] - 696:23, 703:11</p> <p><b>protected</b> [1] - 739:19</p> <p><b>Protection</b> [6] - 668:11, 668:16, 668:17, 677:17, 838:2, 849:11</p> <p><b>protection</b> [3] - 697:17, 743:8, 784:11</p> <p><b>protective</b> [2] - 698:22, 700:10</p> <p><b>protector</b> [13] - 738:21, 739:1, 740:7, 746:16, 771:18, 771:22, 780:10, 780:15, 781:7, 782:4, 787:3, 787:7, 787:11</p> <p><b>protectors</b> [8] - 738:14, 780:20, 785:22, 787:13, 803:21, 803:22, 810:2, 810:8</p> <p><b>protects</b> [1] - 684:22</p> <p><b>protocol</b> [1] - 788:1</p> <p><b>prove</b> [2] - 775:12, 836:5</p> <p><b>provide</b> [12] - 672:17, 736:12, 744:3, 748:6, 762:8, 764:19, 822:4, 829:21, 831:11, 844:2, 865:24, 875:22</p> <p><b>providers</b> [2] - 749:10, 749:17</p> <p><b>provides</b> [3] - 700:7, 745:16, 764:24</p> <p><b>providing</b> [3] - 672:13, 672:22, 733:7</p> <p><b>provision</b> [2] - 894:13, 894:14</p> <p><b>proximity</b> [6] - 692:11, 694:18, 699:7, 847:2, 847:12, 847:16</p> <p><b>prudence</b> [1] - 673:7</p> <p><b>Pterra</b> [2] - 677:15, 855:5</p> <p><b>public</b> [11] - 680:13, 713:8, 715:7, 720:15, 730:14, 844:12, 871:13, 872:19, 879:22, 880:8, 890:13</p> <p><b>PUBLIC</b> [1] - 667:1</p>
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<p><b>Public</b> [9] - 668:2, 668:3, 668:14, 669:1, 669:2, 672:4, 677:18, 678:13, 874:4</p> <p><b>pull</b> [1] - 710:6</p> <p><b>pulled</b> [3] - 749:8, 750:1, 854:14</p> <p><b>PULP</b>.....</p> <p><b>867</b> [1] - 897:9</p> <p><b>pulse</b> [1] - 796:17</p> <p><b>purchase</b> [1] - 747:24</p> <p><b>purely</b> [2] - 753:4, 753:11</p> <p><b>purpose</b> [8] - 672:14, 672:19, 673:22, 686:24, 700:18, 784:2, 799:8</p> <p><b>purposes</b> [2] - 751:13, 852:17</p> <p><b>pursue</b> [1] - 784:20</p> <p><b>pursuing</b> [3] - 713:20, 748:20, 750:9</p> <p><b>push</b> [3] - 697:18, 722:1, 750:7</p> <p><b>pushes</b> [1] - 817:23</p> <p><b>pushing</b> [1] - 750:14</p> <p><b>put</b> [18] - 688:8, 698:10, 719:17, 722:12, 777:1, 777:4, 783:17, 793:24, 794:21, 796:16, 839:24, 843:13, 869:11, 877:21, 878:5, 878:10, 891:13, 892:23</p> <p><b>puts</b> [4] - 704:6, 764:24, 789:11, 846:21</p> <p><b>putting</b> [7] - 703:13, 798:3, 848:10, 875:4, 875:12, 882:10, 887:4</p> <p><b>puzzled</b> [1] - 763:17</p> <p><b>PVL</b> [7] - 732:8, 735:3, 735:4, 735:7, 782:14, 782:18</p>	<p>681:23, 681:24, 682:3, 690:3, 690:16, 696:4, 710:17, 716:6, 716:7, 719:6, 719:10, 721:4, 724:16, 755:22, 763:7, 770:11, 774:2, 789:10, 789:14, 805:3, 808:4, 811:7, 815:2, 815:8, 821:2, 826:3, 826:4, 841:22, 854:2, 865:10, 865:13, 866:6, 867:3, 870:11, 870:23, 891:23</p> <p><b>Queensboro</b> [1] - 690:7</p> <p><b>questioner</b> [1] - 878:8</p> <p><b>questioning</b> [7] - 717:21, 726:1, 779:15, 820:23, 842:13, 849:16, 868:23</p> <p><b>questions</b> [43] - 671:10, 671:16, 672:17, 672:23, 673:21, 673:24, 674:1, 675:12, 726:24, 783:7, 789:7, 790:1, 791:5, 791:15, 798:12, 798:18, 804:11, 815:24, 816:3, 816:8, 821:15, 837:14, 838:6, 838:7, 849:12, 851:23, 855:3, 858:8, 866:23, 867:15, 868:10, 869:19, 877:24, 878:2, 879:12, 880:13, 880:15, 880:16, 880:22, 895:4, 895:15, 895:18, 895:23</p> <p><b>quick</b> [6] - 688:8, 705:12, 754:18, 803:18, 816:1, 866:17</p> <p><b>quickly</b> [16] - 693:8, 699:14, 702:8, 704:11, 704:18, 716:23, 716:24, 721:15, 723:15, 749:23, 772:12, 799:20, 817:15, 839:6, 842:9, 876:2</p> <p><b>quite</b> [10] - 731:24,</p>	<p>741:9, 767:18, 775:17, 780:10, 814:22, 838:12, 844:5, 868:24, 893:18</p> <p><b>quote</b> [3] - 743:18, 756:2, 822:22</p> <p><b>quoted</b> [2] - 811:14, 852:18</p> <p><b>quoting</b> [2] - 740:23, 743:14</p>	<p>889:4, 889:6, 889:11, 889:12, 894:8</p> <p><b>Rates</b> [1] - 889:6</p> <p><b>rates</b> [2] - 889:9, 894:8</p> <p><b>rather</b> [5] - 683:7, 726:12, 740:6, 775:1, 861:11</p> <p><b>rating</b> [5] - 718:15, 718:16, 718:19, 744:11, 744:12</p> <p><b>ratings</b> [1] - 744:13</p> <p><b>ratio</b> [1] - 829:5</p> <p><b>reach</b> [3] - 829:12, 829:15, 839:11</p> <p><b>reached</b> [1] - 840:20</p> <p><b>reacting</b> [1] - 734:13</p> <p><b>reactive</b> [4] - 857:8, 858:18, 863:10, 863:11</p> <p><b>Read</b> [1] - 677:14</p> <p><b>read</b> [8] - 675:19, 752:19, 752:23, 754:13, 754:17, 787:13, 828:19, 863:3</p> <p><b>reader</b> [3] - 752:19, 753:4, 754:16</p> <p><b>readily</b> [3] - 774:12, 802:12, 802:22</p> <p><b>reading</b> [7] - 751:13, 752:17, 753:2, 753:12, 753:18, 754:19, 754:24</p> <p><b>readings</b> [1] - 860:22</p> <p><b>ready</b> [1] - 679:1</p> <p><b>real</b> [8] - 711:3, 750:18, 815:1, 815:20, 830:4, 836:17, 836:19</p> <p><b>realization</b> [1] - 740:3</p> <p><b>realized</b> [5] - 700:3, 715:6, 733:1, 757:2, 796:8</p> <p><b>reallocate</b> [1] - 676:17</p> <p><b>Really</b> [1] - 695:21</p> <p><b>really</b> [47] - 671:7, 671:22, 684:7, 685:7, 686:16, 691:2, 693:22, 702:16, 706:18, 707:4, 710:2, 710:4, 711:24, 716:2, 720:22, 721:22, 726:1, 726:2, 726:7, 732:19, 741:11, 744:20, 750:19, 757:7, 759:19, 765:24, 770:24, 771:5, 773:18,</p>	<p>773:19, 774:9, 787:3, 787:12, 795:1, 802:13, 806:16, 813:19, 816:8, 818:22, 826:19, 833:7, 833:10, 834:10, 847:24, 848:1, 885:5, 892:19</p> <p><b>realm</b> [1] - 878:6</p> <p><b>reason</b> [15] - 675:10, 734:5, 740:2, 754:10, 774:15, 781:5, 791:1, 800:1, 800:21, 828:7, 830:14, 864:6, 864:11, 868:7</p> <p><b>reasonable</b> [1] - 782:11</p> <p><b>reasonably</b> [1] - 736:12</p> <p><b>reasons</b> [11] - 742:7, 746:13, 773:15, 774:14, 781:24, 797:14, 827:1, 831:9, 864:16, 868:1, 890:3</p> <p><b>rebuild</b> [2] - 717:7, 729:15</p> <p><b>rebuilding</b> [2] - 726:6, 727:13</p> <p><b>received</b> [7] - 671:11, 680:24, 726:17, 762:8, 766:5, 769:3, 849:21</p> <p><b>receiver</b> [1] - 750:5</p> <p><b>receivers</b> [2] - 748:22, 853:24</p> <p><b>receiving</b> [4] - 721:14, 721:18, 737:16, 747:17</p> <p><b>recent</b> [1] - 883:8</p> <p><b>Recently</b> [1] - 853:23</p> <p><b>recently</b> [5] - 794:16, 794:22, 819:14, 849:21, 881:8</p> <p><b>recess</b> [1] - 779:13</p> <p><b>Recess</b> [4] - 717:17, 795:11, 837:24, 869:2</p> <p><b>recited</b> [1] - 782:1</p> <p><b>reclose</b> [2] - 772:13, 773:11</p> <p><b>reclosed</b> [2] - 772:17, 772:18</p> <p><b>recognized</b> [6] - 733:8, 786:17, 786:19, 787:4, 787:22, 815:9</p> <p><b>recollection</b> [4] -</p>
<b>Q</b>		<b>R</b>		
<p><b>quality</b> [1] - 773:21</p> <p><b>quantified</b> [1] - 887:21</p> <p><b>quantify</b> [2] - 881:13, 890:20</p> <p><b>quantities</b> [1] - 881:19</p> <p><b>Queens</b> [44] - 669:7, 673:2, 678:15, 679:11, 679:23, 680:9, 680:12,</p>		<p><b>R&amp;D</b> [2] - 750:10, 774:18</p> <p><b>race</b> [1] - 750:7</p> <p><b>radial</b> [3] - 861:11, 861:17, 862:10</p> <p><b>radically</b> [3] - 734:16, 734:22, 734:24</p> <p><b>radio</b> [1] - 752:24</p> <p><b>radioactive</b> [1] - 877:10</p> <p><b>Railroad</b> [5] - 710:22, 804:13, 830:12, 842:15, 843:20</p> <p><b>Rainey</b> [1] - 867:10</p> <p><b>raise</b> [1] - 791:5</p> <p><b>raised</b> [2] - 730:21, 896:1</p> <p><b>Ralph</b> [4] - 678:4, 779:14, 779:18, 796:14</p> <p><b>ran</b> [2] - 716:22, 786:19</p> <p><b>range</b> [3] - 688:12, 689:14, 878:2</p> <p><b>ranging</b> [1] - 880:10</p> <p><b>ranked</b> [1] - 850:16</p> <p><b>rapid</b> [3] - 704:11, 766:10, 833:14</p> <p><b>rare</b> [1] - 773:10</p> <p><b>RASMUSSEN</b> [2] - 870:3, 889:2</p> <p><b>Rasmussen</b> [11] - 680:7, 870:3, 888:11, 888:15, 889:4, 889:21, 893:22, 894:3, 894:6, 894:16, 894:18</p> <p><b>rate</b> [21] - 688:10, 688:13, 688:16, 689:1, 689:2, 689:19, 743:16, 748:16, 750:16, 773:17, 814:17, 820:19, 820:21, 854:1, 888:19,</p>	<p>889:4, 889:6, 889:11, 889:12, 894:8</p> <p><b>Rates</b> [1] - 889:6</p> <p><b>rates</b> [2] - 889:9, 894:8</p> <p><b>rather</b> [5] - 683:7, 726:12, 740:6, 775:1, 861:11</p> <p><b>rating</b> [5] - 718:15, 718:16, 718:19, 744:11, 744:12</p> <p><b>ratings</b> [1] - 744:13</p> <p><b>ratio</b> [1] - 829:5</p> <p><b>reach</b> [3] - 829:12, 829:15, 839:11</p> <p><b>reached</b> [1] - 840:20</p> <p><b>reacting</b> [1] - 734:13</p> <p><b>reactive</b> [4] - 857:8, 858:18, 863:10, 863:11</p> <p><b>Read</b> [1] - 677:14</p> <p><b>read</b> [8] - 675:19, 752:19, 752:23, 754:13, 754:17, 787:13, 828:19, 863:3</p> <p><b>reader</b> [3] - 752:19, 753:4, 754:16</p> <p><b>readily</b> [3] - 774:12, 802:12, 802:22</p> <p><b>reading</b> [7] - 751:13, 752:17, 753:2, 753:12, 753:18, 754:19, 754:24</p> <p><b>readings</b> [1] - 860:22</p> <p><b>ready</b> [1] - 679:1</p> <p><b>real</b> [8] - 711:3, 750:18, 815:1, 815:20, 830:4, 836:17, 836:19</p> <p><b>realization</b> [1] - 740:3</p> <p><b>realized</b> [5] - 700:3, 715:6, 733:1, 757:2, 796:8</p> <p><b>reallocate</b> [1] - 676:17</p> <p><b>Really</b> [1] - 695:21</p> <p><b>really</b> [47] - 671:7, 671:22, 684:7, 685:7, 686:16, 691:2, 693:22, 702:16, 706:18, 707:4, 710:2, 710:4, 711:24, 716:2, 720:22, 721:22, 726:1, 726:2, 726:7, 732:19, 741:11, 744:20, 750:19, 757:7, 759:19, 765:24, 770:24, 771:5, 773:18,</p>	<p>773:19, 774:9, 787:3, 787:12, 795:1, 802:13, 806:16, 813:19, 816:8, 818:22, 826:19, 833:7, 833:10, 834:10, 847:24, 848:1, 885:5, 892:19</p> <p><b>realm</b> [1] - 878:6</p> <p><b>reason</b> [15] - 675:10, 734:5, 740:2, 754:10, 774:15, 781:5, 791:1, 800:1, 800:21, 828:7, 830:14, 864:6, 864:11, 868:7</p> <p><b>reasonable</b> [1] - 782:11</p> <p><b>reasonably</b> [1] - 736:12</p> <p><b>reasons</b> [11] - 742:7, 746:13, 773:15, 774:14, 781:24, 797:14, 827:1, 831:9, 864:16, 868:1, 890:3</p> <p><b>rebuild</b> [2] - 717:7, 729:15</p> <p><b>rebuilding</b> [2] - 726:6, 727:13</p> <p><b>received</b> [7] - 671:11, 680:24, 726:17, 762:8, 766:5, 769:3, 849:21</p> <p><b>receiver</b> [1] - 750:5</p> <p><b>receivers</b> [2] - 748:22, 853:24</p> <p><b>receiving</b> [4] - 721:14, 721:18, 737:16, 747:17</p> <p><b>recent</b> [1] - 883:8</p> <p><b>Recently</b> [1] - 853:23</p> <p><b>recently</b> [5] - 794:16, 794:22, 819:14, 849:21, 881:8</p> <p><b>recess</b> [1] - 779:13</p> <p><b>Recess</b> [4] - 717:17, 795:11, 837:24, 869:2</p> <p><b>recited</b> [1] - 782:1</p> <p><b>reclose</b> [2] - 772:13, 773:11</p> <p><b>reclosed</b> [2] - 772:17, 772:18</p> <p><b>recognized</b> [6] - 733:8, 786:17, 786:19, 787:4, 787:22, 815:9</p> <p><b>recollection</b> [4] -</p>

<p>736:20, 736:21, 806:20, 807:9</p> <p><b>recommendations</b> [2] - 673:10, 673:12</p> <p><b>recommended</b> [1] - 725:7</p> <p><b>reconcile</b> [1] - 796:1</p> <p><b>reconnect</b> [1] - 716:3</p> <p><b>reconsideration</b> [1] - 819:18</p> <p><b>reconstruction</b> [1] - 871:12</p> <p><b>reconvene</b> [1] - 779:11</p> <p><b>record</b> [40] - 670:8, 670:13, 670:20, 671:17, 672:7, 675:20, 676:9, 676:13, 677:1, 677:6, 677:8, 678:10, 678:23, 686:23, 691:10, 717:16, 717:18, 728:23, 731:17, 761:22, 765:7, 765:8, 789:6, 789:8, 792:19, 795:12, 800:10, 838:13, 841:4, 841:6, 869:1, 869:12, 878:14, 879:3, 879:4, 884:2, 886:10, 887:23, 895:5, 895:6</p> <p><b>recorded</b> [3] - 700:19, 864:12, 884:8</p> <p><b>recorder</b> [1] - 773:22</p> <p><b>recorders</b> [4] - 776:1, 776:3, 776:20, 783:17</p> <p><b>recording</b> [3] - 760:10, 774:5, 798:4</p> <p><b>recordings</b> [1] - 774:7</p> <p><b>records</b> [4] - 773:22, 881:3, 881:7, 881:19</p> <p><b>recover</b> [1] - 889:11</p> <p><b>recovered</b> [2] - 888:19, 889:9</p> <p><b>recovering</b> [1] - 889:16</p> <p><b>Recovery</b> [1] - 679:22</p> <p><b>recovery</b> [18] - 680:11, 681:8, 717:6, 727:16, 728:4, 728:6, 728:9, 728:24, 729:5, 887:3, 889:8, 889:11, 892:22, 893:19, 894:1, 894:4, 894:7, 894:24</p> <p><b>rectifier</b> [1] - 808:8</p>	<p><b>recursive</b> [3] - 702:6, 799:18, 839:20</p> <p><b>red</b> [1] - 690:8</p> <p><b>redesign</b> [3] - 684:13, 793:14, 794:1</p> <p><b>redesigned</b> [1] - 791:9</p> <p><b>redirect</b> [2] - 671:21, 716:3</p> <p><b>Reduce</b> [1] - 706:1</p> <p><b>reduce</b> [22] - 693:12, 705:13, 705:21, 705:24, 706:7, 773:17, 775:4, 776:4, 799:20, 799:21, 800:23, 801:15, 818:6, 820:20, 826:14, 837:21, 843:14, 857:21, 859:7, 868:6, 868:14</p> <p><b>reduced</b> [6] - 801:19, 814:16, 814:17, 844:10, 853:19, 876:4</p> <p><b>reduces</b> [1] - 817:23</p> <p><b>reducing</b> [6] - 709:2, 709:3, 768:21, 818:24, 827:3, 844:2</p> <p><b>reduction</b> [53] - 705:18, 705:19, 705:22, 709:4, 795:8, 795:14, 799:6, 799:9, 799:10, 799:14, 799:15, 799:16, 800:3, 800:6, 800:7, 800:15, 800:17, 800:19, 801:2, 801:5, 801:9, 801:20, 801:23, 802:8, 802:17, 803:6, 803:17, 817:8, 817:10, 817:11, 818:13, 819:5, 819:8, 819:16, 819:24, 827:12, 843:9, 843:17, 844:4, 844:23, 855:22, 859:5, 859:11, 859:13, 864:16, 867:21, 868:2, 868:3, 868:8, 868:11, 868:17</p> <p><b>reductions</b> [4] - 768:8, 768:18, 818:12, 827:4</p> <p><b>redundancy</b> [4] - 684:14, 688:2, 817:3, 824:4</p>	<p><b>redundant</b> [2] - 685:3, 780:17</p> <p><b>reenergize</b> [3] - 809:3, 810:1, 810:3</p> <p><b>reenergized</b> [1] - 809:23</p> <p><b>reenergizing</b> [1] - 808:24</p> <p><b>reevaluate</b> [2] - 724:4, 724:6</p> <p><b>refer</b> [2] - 681:21, 706:14</p> <p><b>reference</b> [6] - 725:10, 821:5, 821:6, 822:10, 846:20, 848:10</p> <p><b>referenced</b> [2] - 847:20, 849:17</p> <p><b>referred</b> [9] - 674:15, 688:3, 707:21, 730:5, 790:20, 818:4, 824:1, 851:12, 859:6</p> <p><b>referring</b> [9] - 728:6, 728:7, 729:14, 729:17, 738:20, 751:14, 857:7, 857:9, 879:14</p> <p><b>reflect</b> [5] - 706:9, 709:13, 792:19, 840:21, 841:2</p> <p><b>reflected</b> [1] - 705:15</p> <p><b>reflects</b> [2] - 688:9, 705:10</p> <p><b>refrigerator</b> [1] - 697:13</p> <p><b>regard</b> [14] - 708:14, 708:21, 717:1, 728:17, 729:18, 772:8, 789:10, 789:13, 790:1, 791:16, 805:14, 814:9, 830:2, 834:8</p> <p><b>regarding</b> [3] - 672:13, 719:1, 791:15</p> <p><b>Regarding</b> [1] - 821:18</p> <p><b>regional</b> [2] - 842:4, 849:19</p> <p><b>regions</b> [1] - 730:3</p> <p><b>regulate</b> [2] - 856:22, 856:24</p> <p><b>regulated</b> [1] - 856:7</p> <p><b>regulates</b> [1] - 801:13</p> <p><b>regulatory</b> [2] - 879:23, 880:9</p> <p><b>reimbursed</b> [3] - 887:14, 887:22</p> <p><b>reimbursement</b> [1] -</p>	<p>818:8</p> <p><b>reinforce</b> [3] - 687:18, 687:23, 820:7</p> <p><b>reinforced</b> [1] - 864:24</p> <p><b>reinforcement</b> [3] - 688:5, 814:3, 890:10</p> <p><b>reinforcements</b> [1] - 857:18</p> <p><b>reinforcing</b> [1] - 692:7</p> <p><b>Related</b> [1] - 847:15</p> <p><b>related</b> [15] - 732:5, 751:2, 816:9, 827:14, 828:14, 846:21, 846:22, 859:24, 860:5, 861:4, 863:4, 863:15, 864:18, 871:11, 872:24</p> <p><b>relates</b> [1] - 826:5</p> <p><b>relation</b> [1] - 856:1</p> <p><b>relative</b> [2] - 769:19, 838:22</p> <p><b>relatively</b> [5] - 725:24, 767:13, 768:15, 819:14, 879:10</p> <p><b>relay</b> [10] - 700:22, 772:15, 785:22, 792:18, 797:2, 797:3, 797:4, 798:16, 804:4</p> <p><b>relays</b> [7] - 698:22, 700:10, 784:4, 785:21, 786:4, 787:11, 803:23</p> <p><b>release</b> [2] - 733:4, 886:24</p> <p><b>reliability</b> [15] - 685:9, 689:12, 689:13, 691:10, 712:10, 814:10, 814:13, 820:5, 820:11, 831:9, 831:11, 876:7, 890:13, 890:16</p> <p><b>Reliability</b> [2] - 879:22, 880:8</p> <p><b>reliability/public</b> [2] - 872:12, 873:3</p> <p><b>reliable</b> [5] - 675:20, 684:8, 715:9, 735:13, 736:12</p> <p><b>relies</b> [1] - 759:23</p> <p><b>relocate</b> [1] - 871:14</p> <p><b>rely</b> [2] - 712:12, 829:19</p> <p><b>relying</b> [2] - 754:2, 832:12</p> <p><b>remain</b> [5] - 771:22, 777:15, 777:18, 856:8, 856:22</p>	<p><b>remainder</b> [2] - 735:8, 762:24</p> <p><b>remained</b> [1] - 771:23</p> <p><b>remaining</b> [10] - 708:10, 708:12, 723:22, 728:18, 732:16, 772:7, 781:4, 793:20, 824:18, 868:15</p> <p><b>remains</b> [1] - 857:2</p> <p><b>remember</b> [17] - 699:20, 701:16, 708:23, 740:12, 751:21, 751:22, 755:21, 756:2, 766:13, 800:21, 812:11, 835:20, 838:14, 838:18, 851:11, 853:6</p> <p><b>Remember</b> [2] - 819:7, 856:11</p> <p><b>remote</b> [5] - 745:15, 745:16, 748:1, 756:16, 835:16</p> <p><b>removable</b> [1] - 794:21</p> <p><b>remove</b> [1] - 794:20</p> <p><b>removed</b> [2] - 798:24, 799:1</p> <p><b>renewable</b> [1] - 674:19</p> <p><b>reoccurrence</b> [1] - 701:7</p> <p><b>repair</b> [11] - 698:8, 699:22, 703:13, 713:7, 717:7, 729:15, 739:20, 782:22, 796:18, 809:6, 825:5</p> <p><b>repaired</b> [3] - 729:20, 809:5, 824:20</p> <p><b>repairs</b> [2] - 703:16, 832:23</p> <p><b>rephrase</b> [3] - 751:6, 802:24, 892:18</p> <p><b>replace</b> [6] - 716:23, 752:22, 778:16, 778:19, 778:21, 871:7</p> <p><b>replaced</b> [10] - 741:8, 741:10, 741:13, 742:4, 778:24, 824:20, 881:15, 881:20, 882:24, 883:5</p> <p><b>replacement</b> [8] - 730:6, 741:7, 780:7, 781:19, 825:5, 872:16, 891:3</p> <p><b>Replacements</b> [1] -</p>
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<p>727:22  <b>replacements</b> [2] - 728:1, 728:2  <b>replacing</b> [4] - 717:11, 778:20, 873:3, 873:5  <b>report</b> [59] - 671:15, 671:18, 673:9, 679:19, 681:9, 691:2, 713:3, 713:5, 720:12, 720:13, 720:14, 722:11, 726:14, 726:17, 731:14, 738:12, 741:23, 751:10, 760:1, 769:3, 771:9, 779:22, 781:20, 785:20, 789:16, 790:2, 790:12, 794:5, 795:17, 798:8, 800:4, 800:11, 803:18, 814:22, 815:13, 815:19, 816:4, 821:19, 822:16, 827:17, 832:1, 833:22, 839:8, 843:2, 847:20, 848:6, 859:23, 860:15, 860:21, 860:22, 862:2, 870:9, 870:15, 871:5, 873:15, 878:10, 884:18, 887:1  <b>Report</b> [1] - 679:11  <b>reported</b> [5] - 731:20, 746:19, 772:1, 798:8, 887:5  <b>reporter</b> [2] - 677:6, 679:13  <b>reporting</b> [8] - 741:17, 741:19, 748:16, 750:7, 750:16, 755:6, 769:1, 770:15  <b>reports</b> [13] - 714:12, 719:21, 721:18, 757:2, 757:4, 770:13, 773:8, 829:21, 835:1, 859:22, 862:18, 862:21  <b>represent</b> [3] - 683:19, 767:7, 767:12  <b>representation</b> [1] - 815:19  <b>representative</b> [1] - 713:2  <b>Representatives</b> [1] - 820:22  <b>representatives</b> [4] -</p>	<p>757:16, 757:20, 757:21, 846:7  <b>represented</b> [3] - 681:17, 770:10, 815:12  <b>representing</b> [2] - 677:4, 686:1  <b>represents</b> [1] - 720:8  <b>request</b> [8] - 722:7, 813:3, 818:6, 846:2, 877:22, 878:6, 878:14, 878:19  <b>requesting</b> [2] - 706:6, 843:9  <b>requests</b> [3] - 842:21, 844:4, 844:24  <b>require</b> [1] - 868:19  <b>required</b> [5] - 802:14, 813:18, 836:17, 875:14, 881:24  <b>requirement</b> [1] - 858:5  <b>requirements</b> [1] - 805:14  <b>requires</b> [4] - 671:23, 674:5, 753:7, 786:2  <b>resident</b> [1] - 826:3  <b>residential</b> [6] - 734:19, 765:18, 826:17, 826:24, 827:8, 840:9  <b>Residential</b> [1] - 734:20  <b>residual</b> [1] - 797:18  <b>resources</b> [1] - 788:17  <b>respect</b> [4] - 768:21, 805:1, 845:24, 855:9  <b>respects</b> [1] - 890:23  <b>respond</b> [3] - 672:2, 798:18, 869:19  <b>response</b> [13] - 691:12, 750:17, 755:11, 755:17, 757:19, 836:8, 844:19, 854:20, 868:10, 873:7, 874:7, 874:11, 876:22  <b>Response</b> [1] - 667:5  <b>responses</b> [2] - 726:23, 833:15  <b>responsible</b> [1] - 869:7  <b>rest</b> [8] - 682:18, 682:19, 686:20, 689:18, 689:19, 695:4, 816:2, 834:11  <b>restart</b> [7] - 809:8, 809:9, 809:13, 809:14, 809:15,</p>	<p>809:19, 810:8  <b>restarted</b> [3] - 809:12, 810:13, 810:14  <b>restoration</b> [28] - 681:8, 705:13, 708:1, 708:21, 709:6, 710:3, 715:23, 717:1, 717:2, 721:6, 721:13, 725:1, 729:1, 729:7, 729:12, 729:18, 739:16, 740:15, 741:2, 756:18, 770:1, 770:7, 770:23, 771:6, 772:2, 875:24, 887:7  <b>restorations</b> [1] - 704:2  <b>restore</b> [20] - 693:7, 693:10, 699:14, 699:19, 699:24, 702:7, 703:6, 703:9, 704:18, 704:19, 706:17, 709:10, 716:4, 716:20, 721:7, 722:10, 723:21, 788:16, 799:19, 809:7  <b>restored</b> [14] - 699:23, 703:17, 704:7, 706:23, 709:8, 717:4, 717:5, 729:10, 730:19, 730:21, 731:3, 731:10, 775:8  <b>restoring</b> [10] - 693:12, 708:2, 710:1, 721:9, 729:3, 730:16, 772:21, 775:1, 775:2, 876:2  <b>result</b> [15] - 688:7, 707:11, 712:24, 729:21, 741:2, 771:18, 782:1, 797:5, 816:13, 816:17, 844:5, 850:19, 855:17, 855:19, 859:9  <b>resulted</b> [4] - 691:4, 715:5, 715:6, 862:20  <b>resulting</b> [2] - 816:11, 855:18  <b>results</b> [7] - 733:19, 735:1, 735:13, 736:13, 736:15, 802:3, 803:8  <b>retract</b> [1] - 671:22  <b>retrofit</b> [3] - 817:17, 817:18, 817:20</p>	<p><b>return</b> [2] - 716:2, 772:12  <b>returned</b> [3] - 742:6, 742:7, 830:21  <b>reverse</b> [1] - 739:3  <b>review</b> [2] - 675:8, 765:10  <b>reviewed</b> [1] - 796:23  <b>reviewing</b> [1] - 816:15  <b>revisit</b> [1] - 778:10  <b>revolved</b> [1] - 721:22  <b>revolves</b> [1] - 726:8  <b>RG&amp;E</b> [2] - 669:4, 678:18  <b>Ric</b> [1] - 855:5  <b>Ricardo</b> [1] - 677:14  <b>Richard</b> [5] - 678:4, 680:14, 869:13, 869:14, 872:4  <b>Richter</b> [2] - 668:7, 677:11  <b>ridership</b> [1] - 710:19  <b>rights</b> [2] - 673:14, 853:22  <b>Rikers</b> [7] - 690:10, 734:14, 804:13, 807:5, 843:11, 844:15  <b>rise</b> [2] - 856:17, 871:22  <b>rising</b> [3] - 707:23, 830:20, 879:19  <b>risk</b> [4] - 743:22, 744:22, 814:14, 868:4  <b>risky</b> [1] - 868:5  <b>river</b> [1] - 690:5  <b>River</b> [1] - 701:16  <b>RMS</b> [7] - 746:5, 746:20, 748:16, 750:9, 786:9, 851:23, 853:1  <b>RMSX</b> [1] - 750:10  <b>roads</b> [1] - 871:13  <b>roast</b> [1] - 833:10  <b>Robert</b> [2] - 668:22, 677:21  <b>robust</b> [1] - 685:8  <b>roll</b> [3] - 697:15, 697:16  <b>room</b> [4] - 698:3, 769:2, 823:2, 849:4  <b>rose</b> [1] - 871:17  <b>rough</b> [1] - 828:19  <b>roughly</b> [9] - 729:2, 752:13, 828:21, 870:10, 871:17, 871:19, 888:14, 889:2  <b>round</b> [2] - 687:2,</p>	<p>788:13  <b>Round</b> [1] - 888:16  <b>rounds</b> [5] - 787:7, 787:18, 787:23, 788:2, 788:7  <b>route</b> [3] - 694:15, 696:17, 808:10  <b>routine</b> [1] - 743:24  <b>routinely</b> [1] - 780:2  <b>row</b> [1] - 792:2  <b>rug</b> [1] - 749:8  <b>rules</b> [2] - 879:24, 880:1  <b>ruling</b> [3] - 670:14, 671:23, 676:12  <b>run</b> [11] - 693:3, 694:20, 716:5, 722:7, 782:18, 784:11, 786:24, 808:3, 816:1, 833:8, 847:4  <b>running</b> [8] - 696:16, 723:20, 764:8, 764:11, 778:9, 823:6, 833:3, 893:23  <b>runs</b> [1] - 737:22  <b>runways</b> [1] - 805:16</p>
<b>S</b>				
<p><b>safe</b> [2] - 703:15, 884:8  <b>safety</b> [5] - 872:12, 873:3, 879:22, 880:8, 890:13  <b>Safety</b> [1] - 776:13  <b>safety/reliability</b> [1] - 872:20  <b>sake</b> [2] - 718:5, 848:13  <b>Sam</b> [1] - 677:14  <b>sanity</b> [1] - 756:10  <b>saturation</b> [3] - 796:11, 797:20, 797:21  <b>Saturday</b> [1] - 842:10  <b>save</b> [1] - 772:24  <b>saved</b> [1] - 830:10  <b>savvy</b> [1] - 860:21  <b>saw</b> [12] - 675:17, 708:5, 709:8, 709:10, 757:4, 758:19, 758:20, 764:9, 784:3, 784:4, 784:23, 816:18  <b>scale</b> [2] - 689:11, 707:13  <b>scenario</b> [3] - 732:15, 827:23, 851:1  <b>schedule</b> [1] - 782:22</p>				

<p><b>scheduled</b> [1] - 830:21</p> <p><b>science</b> [2] - 701:3, 765:12</p> <p><b>scope</b> [1] - 728:17</p> <p><b>screen</b> [1] - 769:6</p> <p><b>season</b> [1] - 838:21</p> <p><b>Second</b> [2] - 679:18, 822:22</p> <p><b>second</b> [27] - 684:12, 684:18, 688:3, 688:20, 695:11, 695:12, 698:19, 702:24, 703:3, 708:6, 709:6, 709:21, 716:7, 727:10, 773:9, 773:11, 774:17, 780:17, 789:6, 795:15, 810:9, 816:13, 834:5, 856:22, 879:6, 895:5</p> <p><b>secondaries</b> [1] - 882:18</p> <p><b>secondary</b> [83] - 683:6, 683:17, 683:19, 685:3, 685:12, 685:23, 692:16, 692:19, 693:1, 693:19, 693:23, 694:5, 694:6, 694:12, 694:13, 694:19, 699:10, 702:1, 702:23, 707:17, 707:18, 708:14, 708:16, 711:23, 717:7, 717:8, 719:19, 720:7, 721:14, 722:17, 722:22, 725:1, 725:16, 725:19, 725:22, 726:4, 732:7, 735:18, 739:8, 740:4, 742:11, 750:14, 757:11, 759:3, 771:15, 771:17, 779:2, 779:5, 779:6, 781:23, 786:15, 786:23, 787:6, 787:16, 804:4, 829:21, 830:18, 840:2, 840:4, 840:5, 841:8, 859:17, 859:24, 860:1, 860:5, 860:16, 860:18, 861:5, 862:20, 863:5, 863:6, 864:14,</p>	<p>864:19, 871:7, 872:14, 872:15, 873:5, 881:16, 890:15, 891:11</p> <p><b>Secondary</b> [1] - 694:14</p> <p><b>seconds</b> [1] - 714:6</p> <p><b>section</b> [10] - 680:10, 687:23, 778:19, 778:21, 786:9, 799:8, 814:21, 862:8, 881:20, 883:5</p> <p><b>sections</b> [2] - 716:23, 882:23</p> <p><b>see</b> [48] - 675:9, 685:3, 686:1, 688:11, 688:12, 688:17, 689:20, 690:4, 694:11, 697:9, 702:22, 704:14, 705:5, 705:10, 706:9, 706:15, 711:10, 758:24, 772:14, 775:22, 776:17, 780:3, 782:8, 785:2, 790:9, 793:3, 797:9, 809:8, 810:20, 811:5, 815:19, 817:14, 823:18, 823:23, 828:8, 834:23, 836:2, 855:1, 860:8, 860:12, 861:3, 861:14, 868:11, 879:18, 880:5, 885:21, 892:24, 896:4</p> <p><b>seeing</b> [7] - 687:14, 687:15, 719:17, 798:4, 812:7, 812:9, 891:7</p> <p><b>Seeing</b> [2] - 676:14, 678:23</p> <p><b>seek</b> [5] - 889:11, 893:17, 894:1, 894:4, 894:24</p> <p><b>seeking</b> [2] - 672:23, 894:7</p> <p><b>seem</b> [3] - 676:19, 772:6, 835:22</p> <p><b>seemingly</b> [1] - 821:16</p> <p><b>segregate</b> [1] - 884:24</p> <p><b>selects</b> [1] - 801:9</p> <p><b>self</b> [3] - 692:7, 713:3, 714:4</p> <p><b>send</b> [4] - 746:3, 752:18, 753:21, 848:19</p> <p><b>sending</b> [1] - 835:7</p> <p><b>sends</b> [4] - 747:10,</p>	<p>747:11, 801:10, 846:7</p> <p><b>senior</b> [3] - 680:5, 680:19, 869:23</p> <p><b>sense</b> [11] - 698:23, 730:23, 744:20, 744:21, 768:7, 783:5, 832:4, 832:16, 880:3, 882:1, 883:12</p> <p><b>sensitive</b> [3] - 767:5, 783:3, 871:9</p> <p><b>sensitivity</b> [1] - 837:3</p> <p><b>sensor</b> [1] - 747:11</p> <p><b>sensors</b> [1] - 747:17</p> <p><b>sent</b> [6] - 714:22, 753:16, 801:23, 803:2, 835:10, 844:16</p> <p><b>sentence</b> [2] - 846:22, 883:20</p> <p><b>separated</b> [2] - 693:19, 767:24</p> <p><b>separately</b> [2] - 878:16, 878:17</p> <p><b>separates</b> [1] - 759:4</p> <p><b>separation</b> [1] - 766:2</p> <p><b>September</b> [9] - 667:8, 679:20, 687:10, 688:5, 848:5, 887:11, 887:22, 887:24, 888:1</p> <p><b>sequence</b> [3] - 681:2, 691:3, 691:14</p> <p><b>series</b> [4] - 674:22, 722:3, 808:11, 841:16</p> <p><b>serious</b> [7] - 699:12, 699:13, 704:17, 734:4, 789:12, 819:20, 847:6</p> <p><b>serve</b> [3] - 716:21, 777:9, 794:6</p> <p><b>served</b> [1] - 690:2</p> <p><b>service</b> [95] - 681:11, 683:1, 689:22, 692:13, 692:14, 692:15, 692:16, 692:18, 693:1, 693:4, 693:7, 694:21, 694:23, 695:6, 698:11, 700:12, 701:19, 701:22, 701:23, 702:1, 702:17, 703:9, 703:18, 704:8, 708:12, 710:12, 711:19, 712:2, 712:8, 712:9, 712:12, 712:14,</p>	<p>713:2, 713:3, 714:4, 715:12, 715:17, 715:20, 720:10, 720:20, 723:18, 727:2, 729:3, 730:16, 730:19, 730:21, 742:2, 742:3, 742:6, 742:8, 744:19, 753:23, 754:3, 758:20, 765:21, 769:17, 772:12, 772:14, 779:23, 780:2, 780:4, 781:5, 781:18, 782:17, 782:19, 782:21, 793:9, 793:11, 800:1, 801:11, 815:14, 819:5, 829:20, 830:21, 831:4, 834:12, 835:8, 835:17, 847:13, 851:14, 861:7, 861:9, 863:4, 863:6, 863:19, 864:14, 868:15, 873:1, 874:20, 874:22, 879:7, 880:22, 887:4, 895:20</p> <p><b>SERVICE</b> [1] - 667:1</p> <p><b>Service</b> [5] - 668:2, 668:3, 672:4, 677:18, 874:4</p> <p><b>service</b> [1] - 848:10</p> <p><b>services</b> [2] - 680:12, 837:3</p> <p><b>serving</b> [1] - 777:14</p> <p><b>set</b> [13] - 695:14, 700:22, 717:21, 732:22, 733:24, 764:17, 779:11, 792:13, 816:5, 856:8, 884:24, 889:6, 895:2</p> <p><b>sets</b> [1] - 865:23</p> <p><b>setting</b> [2] - 700:10, 700:21</p> <p><b>settings</b> [3] - 701:3, 701:6, 798:16</p> <p><b>seven</b> [9] - 689:4, 710:16, 718:6, 728:14, 742:8, 820:18, 838:11, 838:13, 850:24</p> <p><b>seven-day</b> [1] - 850:24</p> <p><b>seventh</b> [4] - 704:12, 709:11, 719:11, 737:4</p> <p><b>Several</b> [1] - 791:15</p>	<p><b>several</b> [11] - 697:6, 726:12, 730:21, 746:13, 772:17, 776:23, 793:7, 815:13, 820:16, 861:13, 873:2</p> <p><b>severe</b> [1] - 734:9</p> <p><b>sewer</b> [1] - 694:16</p> <p><b>shaded</b> [1] - 710:7</p> <p><b>share</b> [1] - 847:13</p> <p><b>shared</b> [2] - 685:11, 715:7</p> <p><b>shares</b> [1] - 725:9</p> <p><b>sharply</b> [1] - 871:22</p> <p><b>shedding</b> [1] - 868:2</p> <p><b>Sherman</b> [1] - 726:15</p> <p><b>Shift</b> [1] - 795:7</p> <p><b>shift</b> [3] - 681:21, 746:1, 890:9</p> <p><b>shifted</b> [2] - 734:23, 734:24</p> <p><b>shifting</b> [1] - 880:4</p> <p><b>Shifting</b> [1] - 783:5</p> <p><b>shipped</b> [1] - 865:16</p> <p><b>short</b> [11] - 696:22, 700:9, 704:14, 713:15, 737:19, 750:18, 801:4, 821:20, 829:17, 830:22, 835:2</p> <p><b>shorter</b> [1] - 814:16</p> <p><b>show</b> [17] - 685:21, 690:2, 699:5, 700:14, 704:11, 707:1, 707:13, 709:14, 709:24, 710:7, 711:12, 714:10, 786:3, 790:16, 792:20, 831:9, 879:13</p> <p><b>showed</b> [17] - 686:12, 691:10, 693:18, 706:24, 709:14, 709:15, 714:11, 729:9, 738:22, 759:22, 770:10, 786:10, 790:8, 833:18, 851:13</p> <p><b>showing</b> [6] - 683:11, 683:14, 683:20, 693:21, 693:23, 707:6</p> <p><b>shown</b> [6] - 690:11, 690:12, 705:4, 730:9, 790:6, 867:20</p> <p><b>shows</b> [15] - 682:7, 682:20, 683:7, 688:24, 690:15, 700:20, 704:4, 712:16, 714:13,</p>
---	---	---	---	--

<p>717:1, 779:22, 789:16, 789:17, 800:12</p> <p><b>shunts</b> [1] - 716:22</p> <p><b>shut</b> [33] - 681:6, 707:3, 707:20, 708:19, 710:23, 710:24, 711:7, 715:21, 718:20, 718:21, 719:1, 719:15, 720:4, 722:8, 723:5, 723:14, 724:5, 724:7, 724:15, 725:8, 726:8, 726:18, 726:19, 728:19, 809:6, 830:10, 830:14, 841:1, 841:19, 845:2, 849:18, 849:21, 850:11</p> <p><b>shutting</b> [15] - 710:10, 711:1, 721:3, 722:6, 723:11, 724:2, 724:12, 830:13, 831:2, 831:12, 831:15, 842:20, 842:23, 843:24, 892:21</p> <p><b>sick</b> [1] - 678:3</p> <p><b>side</b> [32] - 671:21, 682:18, 685:5, 686:10, 696:6, 696:7, 696:8, 696:10, 710:8, 771:18, 792:8, 792:23, 818:17, 819:21, 820:14, 820:19, 826:7, 826:18, 829:22, 840:11, 848:22, 848:24, 856:16, 859:17, 859:19, 860:16, 860:18, 874:13, 880:5, 889:4, 891:10</p> <p><b>sign</b> [2] - 705:20, 818:5</p> <p><b>signal</b> [5] - 701:9, 747:10, 801:10, 835:7, 848:20</p> <p><b>signals</b> [5] - 710:24, 713:14, 758:11, 760:20, 835:15</p> <p><b>signed</b> [2] - 819:9</p> <p><b>significance</b> [7] - 739:13, 739:14, 740:18, 740:22, 740:24, 741:4, 892:17</p>	<p><b>significant</b> [21] - 691:19, 701:18, 711:2, 719:14, 725:17, 728:11, 732:3, 764:20, 766:3, 770:1, 799:12, 807:12, 827:5, 827:20, 840:17, 844:18, 859:13, 876:7, 877:4, 893:2, 893:6</p> <p><b>significantly</b> [13] - 686:20, 701:10, 709:1, 734:17, 768:24, 777:10, 809:22, 812:19, 816:14, 851:2, 861:21, 876:4, 877:16</p> <p><b>signing</b> [1] - 884:7</p> <p><b>signs</b> [1] - 707:13</p> <p><b>silograph</b> [1] - 700:19</p> <p><b>similar</b> [11] - 693:3, 742:19, 749:5, 756:9, 784:24, 795:20, 874:23, 883:9, 885:7, 885:9, 894:23</p> <p><b>similarly</b> [1] - 682:22</p> <p><b>simple</b> [8] - 683:20, 691:17, 691:19, 701:4, 821:16, 832:16, 836:11, 836:14</p> <p><b>simplicity</b> [2] - 685:16, 693:20</p> <p><b>simplified</b> [6] - 681:13, 682:7, 693:20, 693:23, 695:20, 790:12</p> <p><b>simplistic</b> [1] - 894:13</p> <p><b>simply</b> [2] - 752:11, 762:2</p> <p><b>simulate</b> [3] - 732:20, 735:4, 736:4</p> <p><b>simulated</b> [1] - 784:13</p> <p><b>simulation</b> [3] - 733:16, 736:10, 876:20</p> <p><b>simulations</b> [1] - 785:10</p> <p><b>simulator</b> [2] - 732:14, 736:5</p> <p><b>simulators</b> [1] - 732:19</p> <p><b>simultaneously</b> [3] - 705:16, 834:3, 834:4</p> <p><b>single</b> [2] - 794:6, 862:11</p> <p><b>sirens</b> [1] - 836:21</p>	<p><b>slit</b> [2] - 831:19, 886:19</p> <p><b>site</b> [1] - 805:16</p> <p><b>situation</b> [34] - 694:14, 695:4, 695:7, 695:8, 699:15, 701:15, 701:17, 702:6, 704:17, 708:9, 721:22, 733:12, 733:13, 733:16, 736:4, 771:22, 775:16, 787:1, 790:14, 799:11, 799:18, 800:17, 831:23, 832:5, 834:7, 836:18, 839:24, 840:10, 841:24, 842:9, 848:21, 857:1, 893:10</p> <p><b>six</b> [20] - 702:20, 728:14, 738:15, 740:18, 740:19, 740:21, 740:23, 740:24, 741:1, 771:10, 814:23, 820:18, 831:6, 839:9, 866:1, 883:16, 892:8, 892:11</p> <p><b>six-year</b> [1] - 892:8</p> <p><b>sixth</b> [7] - 704:12, 718:24, 719:11, 721:8, 721:11, 721:16, 839:7</p> <p><b>sizable</b> [1] - 819:3</p> <p><b>size</b> [3] - 696:5, 697:13, 863:16</p> <p><b>slam</b> [1] - 698:21</p> <p><b>slide</b> [19] - 680:1, 683:3, 683:8, 685:16, 685:21, 686:12, 686:24, 688:9, 691:11, 693:18, 709:14, 710:6, 711:12, 714:11, 738:23, 770:10, 879:13, 879:21, 880:4</p> <p><b>slides</b> [5] - 680:2, 688:8, 831:10, 861:16, 879:10</p> <p><b>slight</b> [1] - 766:11</p> <p><b>slightly</b> [6] - 738:8, 798:16, 812:11, 812:12, 812:14, 858:7</p> <p><b>small</b> [14] - 704:24, 725:24, 758:7, 768:15, 783:21, 826:17, 826:23,</p>	<p>827:2, 827:4, 827:8, 860:3, 862:23, 862:24</p> <p><b>smaller</b> [1] - 714:21</p> <p><b>smoking</b> [1] - 773:9</p> <p><b>snapshot</b> [5] - 708:4, 753:10, 802:7, 802:14, 862:15</p> <p><b>snapshots</b> [1] - 802:11</p> <p><b>SOCCX</b> [2] - 738:4, 790:20</p> <p><b>software</b> [6] - 733:10, 733:16, 733:22, 745:17, 749:19, 802:11</p> <p><b>sole</b> [1] - 868:7</p> <p><b>solely</b> [2] - 870:13, 870:19</p> <p><b>solid</b> [4] - 785:24, 786:12, 788:10, 818:22</p> <p><b>solution</b> [4] - 750:18, 784:10, 819:22, 820:11</p> <p><b>someone</b> [8] - 675:11, 760:15, 763:8, 766:21, 766:22, 845:15, 858:13, 858:14</p> <p><b>sometime</b> [6] - 687:10, 698:11, 732:23, 755:16, 756:11, 766:7</p> <p><b>sometimes</b> [6] - 675:14, 693:2, 733:17, 796:19, 860:20, 860:24</p> <p><b>Sometimes</b> [3] - 773:8, 796:17, 860:22</p> <p><b>somewhat</b> [8] - 674:24, 735:5, 760:7, 787:16, 796:19, 827:14, 855:20, 894:6</p> <p><b>somewhere</b> [2] - 755:6, 788:6</p> <p><b>somewheres</b> [1] - 766:14</p> <p><b>soon</b> [2] - 726:16, 799:7</p> <p><b>sooner</b> [1] - 791:7</p> <p><b>sophisticated</b> [2] - 732:21, 753:7</p> <p><b>Sorry</b> [2] - 862:17, 893:11</p> <p><b>sorry</b> [5] - 731:18, 778:12, 789:22, 828:17, 878:18</p>	<p><b>Sort</b> [1] - 841:23</p> <p><b>sort</b> [33] - 685:18, 691:10, 693:15, 693:16, 694:13, 703:21, 709:13, 709:22, 713:10, 747:6, 748:8, 749:4, 749:8, 750:8, 753:3, 753:21, 754:1, 764:14, 766:4, 783:22, 793:13, 810:9, 823:11, 825:14, 828:9, 841:11, 847:4, 851:15, 851:16, 873:11, 873:18, 882:11</p> <p><b>sorts</b> [3] - 816:24, 834:22, 880:1</p> <p><b>sound</b> [2] - 767:17, 784:7</p> <p><b>sounds</b> [2] - 794:6, 837:2</p> <p><b>Sounds</b> [1] - 803:9</p> <p><b>source</b> [4] - 739:22, 860:19, 867:2</p> <p><b>sources</b> [4] - 815:13, 858:2, 865:21, 866:5</p> <p><b>south</b> [1] - 690:5</p> <p><b>Southern</b> [4] - 751:16, 752:2, 752:4, 835:21</p> <p><b>space</b> [1] - 839:8</p> <p><b>Spanish</b> [1] - 712:20</p> <p><b>sparing</b> [1] - 756:24</p> <p><b>speaker</b> [2] - 706:6, 792:19</p> <p><b>speakers</b> [2] - 678:2, 895:12</p> <p><b>speaking</b> [5] - 670:9, 671:13, 767:11, 837:1, 884:1</p> <p><b>spec</b> [2] - 729:22, 802:15</p> <p><b>spec's</b> [1] - 802:10</p> <p><b>Special</b> [1] - 668:13</p> <p><b>special</b> [4] - 742:22, 820:18, 889:8, 889:12</p> <p><b>specialized</b> [3] - 700:17, 783:17, 784:1</p> <p><b>Specific</b> [1] - 807:6</p> <p><b>specific</b> [11] - 768:8, 769:22, 778:16, 787:20, 798:4, 809:6, 811:13, 845:24, 866:11, 872:22, 885:20</p> <p><b>Specifically</b> [1] - 865:6</p>
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<p><b>specifically</b> [8] - 767:19, 786:22, 808:5, 826:8, 843:19, 846:2, 881:11, 890:4</p> <p><b>specification</b> [5] - 707:16, 801:21, 802:4, 803:1, 850:5</p> <p><b>specifics</b> [1] - 872:1</p> <p><b>specifies</b> [1] - 727:5</p> <p><b>speculate</b> [1] - 774:15</p> <p><b>speed</b> [3] - 717:15, 773:22, 844:10</p> <p><b>spelled</b> [1] - 850:2</p> <p><b>spend</b> [1] - 893:8</p> <p><b>spending</b> [2] - 674:7, 894:20</p> <p><b>spent</b> [11] - 870:10, 870:13, 870:19, 870:21, 871:2, 876:22, 885:16, 886:20, 891:16, 892:5, 893:7</p> <p><b>spike</b> [1] - 816:12</p> <p><b>spliced</b> [1] - 686:4</p> <p><b>split</b> [1] - 777:12</p> <p><b>sponsored</b> [1] - 846:11</p> <p><b>spot</b> [6] - 718:10, 718:11, 767:16, 768:2, 781:12, 808:19</p> <p><b>Sprain</b> [1] - 867:10</p> <p><b>spread</b> [3] - 754:12, 861:11, 861:13</p> <p><b>spring</b> [1] - 727:23</p> <p><b>Sprint</b> [3] - 760:21, 761:13, 763:4</p> <p><b>square</b> [1] - 792:4</p> <p><b>stability</b> [1] - 706:18</p> <p><b>stabilize</b> [3] - 710:14, 716:2, 834:12</p> <p><b>stabilized</b> [2] - 710:4, 770:4</p> <p><b>Stabilizing</b> [1] - 723:2</p> <p><b>stabilizing</b> [4] - 710:1, 722:23, 722:24, 723:3</p> <p><b>stable</b> [1] - 770:24</p> <p><b>staff</b> [18] - 671:15, 671:16, 672:4, 673:9, 674:2, 674:7, 677:2, 677:19, 717:19, 721:21, 724:18, 744:18, 782:23, 835:4, 874:4, 880:18, 895:16</p> <p><b>Staff's</b> [1] - 667:6</p> <p><b>staff's</b> [2] - 671:18,</p>	<p>672:24</p> <p><b>Staff</b>.....</p> <p><b>718</b> [1] - 897:3</p> <p><b>Staff</b>.....</p> <p><b>881</b> [1] - 897:15</p> <p><b>stage</b> [3] - 816:5, 819:8, 875:16</p> <p><b>stake</b> [1] - 854:15</p> <p><b>stand</b> [4] - 672:7, 672:10, 678:9, 679:4</p> <p><b>standard</b> [3] - 674:20, 735:15, 811:10</p> <p><b>standpoint</b> [1] - 884:21</p> <p><b>stands</b> [2] - 850:18</p> <p><b>start</b> [13] - 680:20, 717:22, 755:4, 755:8, 762:6, 779:20, 809:3, 810:9, 861:13, 862:23, 873:20, 873:24, 874:1</p> <p><b>Started</b> [1] - 794:20</p> <p><b>started</b> [9] - 700:13, 752:15, 754:10, 821:18, 821:20, 844:16, 854:24, 872:24, 874:15</p> <p><b>Starting</b> [1] - 766:6</p> <p><b>starting</b> [7] - 691:21, 706:5, 752:6, 810:11, 829:14, 853:24, 871:21</p> <p><b>stat</b> [1] - 715:10</p> <p><b>STATE</b> [1] - 667:1</p> <p><b>state</b> [9] - 670:13, 682:18, 722:9, 723:4, 779:21, 785:24, 786:12, 833:2, 869:20</p> <p><b>State</b> [8] - 668:3, 668:3, 668:18, 669:2, 677:16, 689:18, 705:17, 820:14</p> <p><b>statement</b> [8] - 676:4, 676:7, 730:15, 741:16, 795:17, 795:20, 803:1, 888:23</p> <p><b>statements</b> [1] - 675:16</p> <p><b>Staten</b> [2] - 688:23, 763:7</p> <p><b>states</b> [1] - 870:9</p> <p><b>static</b> [1] - 704:4</p> <p><b>station</b> [30] - 681:15, 683:13, 687:6, 695:13, 695:19, 695:21, 696:17,</p>	<p>705:24, 712:5, 726:11, 738:4, 783:19, 791:11, 800:23, 801:10, 806:12, 808:14, 808:18, 813:23, 814:5, 856:20, 857:4, 857:14, 857:15, 857:21, 857:22, 859:3, 865:11, 865:22, 865:23</p> <p><b>stationary</b> [1] - 792:8</p> <p><b>stations</b> [6] - 687:14, 793:7, 807:24, 808:6, 808:8, 808:11</p> <p><b>statistical</b> [1] - 776:16</p> <p><b>statistics</b> [2] - 782:10, 786:3</p> <p><b>stats</b> [8] - 690:14, 830:20, 834:24, 846:13, 846:14, 866:11</p> <p><b>status</b> [2] - 725:2, 841:4</p> <p><b>statute</b> [1] - 674:5</p> <p><b>stay</b> [1] - 700:12</p> <p><b>stayed</b> [2] - 710:12, 876:24</p> <p><b>staying</b> [1] - 771:18</p> <p><b>stays</b> [1] - 773:1</p> <p><b>steadily</b> [1] - 860:14</p> <p><b>STEIN</b> [85] - 667:15, 670:1, 672:1, 673:17, 674:10, 674:14, 676:23, 678:7, 678:17, 678:22, 679:2, 679:6, 679:15, 680:17, 717:14, 717:18, 728:21, 730:13, 731:9, 731:13, 752:8, 759:16, 760:5, 760:13, 761:9, 761:13, 761:16, 761:23, 762:17, 763:4, 763:10, 765:7, 766:21, 778:8, 778:14, 779:9, 784:20, 789:5, 792:19, 795:5, 795:9, 795:12, 798:21, 799:3, 813:2, 815:21, 819:12, 820:12, 820:22, 822:24, 828:16, 829:2, 829:7, 836:6, 837:23, 838:1,</p>	<p>849:11, 854:19, 855:1, 855:4, 856:18, 866:15, 866:19, 866:24, 868:22, 869:3, 869:11, 869:17, 870:5, 877:21, 878:1, 878:21, 879:1, 879:3, 879:5, 880:13, 880:19, 883:19, 886:4, 886:9, 887:23, 888:4, 888:21, 895:3, 895:7</p> <p><b>Stein</b> [1] - 676:24</p> <p><b>stenographer</b> [1] - 866:20</p> <p><b>step</b> [6] - 682:12, 686:9, 716:2, 830:6, 859:16, 867:5</p> <p><b>stepped</b> [1] - 682:2</p> <p><b>steps</b> [5] - 682:21, 821:12, 832:20, 834:19, 857:20</p> <p><b>stiffening</b> [1] - 793:14</p> <p><b>still</b> [26] - 685:5, 692:21, 695:5, 699:21, 725:23, 728:19, 735:12, 735:13, 743:21, 750:8, 774:18, 780:18, 782:24, 785:4, 785:14, 818:10, 820:6, 823:6, 824:19, 825:16, 833:3, 848:3, 851:14, 884:22, 885:2</p> <p><b>Still</b> [2] - 683:8, 770:16</p> <p><b>stop</b> [4] - 758:19, 758:24, 759:2, 784:4</p> <p><b>stores</b> [2] - 758:20, 759:1</p> <p><b>storm</b> [7] - 762:15, 874:1, 874:3, 874:13, 874:24, 876:20, 877:16</p> <p><b>storms</b> [4] - 684:23, 712:22, 712:23, 874:11</p> <p><b>story</b> [1] - 826:16</p> <p><b>straight</b> [2] - 677:8, 893:19</p> <p><b>straightforward</b> [1] - 879:10</p> <p><b>stream</b> [1] - 857:3</p> <p><b>streamlined</b> [1] - 714:4</p> <p><b>street</b> [11] - 683:21,</p>	<p>684:1, 694:2, 710:24, 715:2, 753:1, 753:2, 753:8, 753:10, 861:3, 882:7</p> <p><b>Street</b> [4] - 667:10, 668:21, 669:2, 872:13</p> <p><b>streets</b> [1] - 685:11</p> <p><b>strengthen</b> [1] - 691:11</p> <p><b>stress</b> [5] - 824:21, 824:24, 825:1, 846:21, 868:15</p> <p><b>stressed</b> [1] - 816:23</p> <p><b>stresses</b> [1] - 742:11</p> <p><b>strictly</b> [1] - 754:23</p> <p><b>strike</b> [1] - 784:24</p> <p><b>step</b> [6] - 682:12, 686:9, 716:2, 830:6, 859:16, 867:5</p> <p><b>stronger</b> [1] - 671:8</p> <p><b>strongly</b> [1] - 821:4</p> <p><b>struck</b> [1] - 740:21</p> <p><b>structure</b> [4] - 686:3, 793:15, 864:9, 888:19</p> <p><b>structures</b> [5] - 684:21, 708:15, 709:19, 717:10, 730:10</p> <p><b>struggling</b> [2] - 703:24, 704:18</p> <p><b>studies</b> [8] - 751:3, 782:17, 782:18, 784:12, 785:6, 785:13, 803:20, 847:24</p> <p><b>study</b> [13] - 744:19, 745:3, 751:23, 775:10, 775:17, 776:22, 797:23, 798:2, 803:18, 813:7, 835:4, 847:18</p> <p><b>studying</b> [3] - 785:4, 797:23, 848:3</p> <p><b>stuff</b> [3] - 751:5, 770:8, 849:13</p> <p><b>style</b> [1] - 873:4</p> <p><b>subcategories</b> [1] - 817:13</p> <p><b>subcycle</b> [1] - 773:23</p> <p><b>subject</b> [8] - 675:9, 675:14, 675:22, 678:9, 679:4, 766:17, 799:5, 895:20</p> <p><b>Subject</b> [2] - 679:5, 766:16</p> <p><b>subjected</b> [1] - 676:7</p> <p><b>subjects</b> [1] - 810:16</p> <p><b>submit</b> [2] - 671:18, 874:4</p> <p><b>submitted</b> [1] - 681:10</p>
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<p><b>subscribers</b> [1] - 827:10</p> <p><b>subsequent</b> [6] - 673:13, 706:9, 706:10, 729:21, 730:4, 808:15</p> <p><b>Subsequently</b> [2] - 795:21, 795:22</p> <p><b>subsequently</b> [1] - 757:24</p> <p><b>substantial</b> [3] - 691:20, 727:13, 890:18</p> <p><b>substantially</b> [1] - 889:21</p> <p><b>substation</b> [40] - 682:1, 690:16, 703:4, 726:12, 726:15, 726:20, 726:21, 726:22, 739:7, 747:13, 773:21, 774:2, 790:22, 801:16, 805:9, 805:11, 806:13, 806:14, 807:2, 813:6, 813:9, 813:11, 813:18, 813:20, 814:1, 814:3, 814:15, 854:2, 856:8, 856:11, 857:11, 857:18, 863:8, 863:18, 863:19, 864:18, 865:10, 865:12, 873:1</p> <p><b>substations</b> [12] - 681:19, 681:22, 745:5, 774:1, 805:2, 859:20, 865:13, 867:11, 872:5, 872:7, 872:8, 890:12</p> <p><b>substitute</b> [1] - 753:4</p> <p><b>subway</b> [3] - 710:16, 710:17, 808:13</p> <p><b>successful</b> [5] - 709:24, 772:19, 772:20, 772:21, 774:22</p> <p><b>succession</b> [1] - 694:8</p> <p><b>sudden</b> [1] - 700:7</p> <p><b>suddenly</b> [2] - 762:5, 847:6</p> <p><b>suffered</b> [1] - 836:19</p> <p><b>sufficiency</b> [1] - 875:20</p> <p><b>sufficient</b> [7] - 759:17, 760:9, 771:11, 771:13, 786:16, 787:6, 787:17</p>	<p><b>suggest</b> [2] - 803:11, 880:19</p> <p><b>suggestion</b> [3] - 801:21, 801:22, 830:8</p> <p><b>Suite</b> [2] - 668:18, 669:2</p> <p><b>suited</b> [2] - 763:14, 877:11</p> <p><b>summary</b> [2] - 821:19, 832:1</p> <p><b>summer</b> [34] - 681:1, 684:12, 684:15, 686:16, 686:20, 686:22, 687:1, 687:2, 687:3, 687:9, 687:12, 687:13, 687:19, 688:1, 690:17, 703:18, 705:4, 777:2, 782:9, 793:17, 805:13, 810:18, 813:8, 813:22, 816:7, 825:23, 829:13, 838:21, 857:16, 858:9, 860:9, 860:11, 873:1, 876:7</p> <p><b>Summer</b> [1] - 686:17</p> <p><b>sun</b> [1] - 757:9</p> <p><b>SUNDAS</b> [3] - 749:3, 749:13, 750:1</p> <p><b>Sunday</b> [3] - 717:3, 811:1, 816:21</p> <p><b>Sunnyside</b> [3] - 821:2, 826:4, 826:9</p> <p><b>super</b> [1] - 827:17</p> <p><b>superimposed</b> [2] - 704:22, 835:1</p> <p><b>supervised</b> [1] - 698:17</p> <p><b>supervisory</b> [2] - 793:9, 793:23</p> <p><b>supplemental</b> [1] - 741:23</p> <p><b>supplied</b> [27] - 682:1, 683:8, 684:5, 686:13, 686:22, 690:13, 690:16, 690:20, 690:21, 697:18, 698:20, 698:22, 699:10, 701:20, 701:21, 701:24, 710:11, 710:18, 710:22, 711:21, 712:22, 725:20, 728:18, 731:4, 805:2, 808:12, 852:6</p> <p><b>supplier</b> [2] - 852:1, 853:14</p>	<p><b>suppliers</b> [1] - 693:15</p> <p><b>supplies</b> [14] - 682:5, 682:22, 686:7, 690:10, 690:11, 697:17, 707:9, 708:2, 726:15, 774:3, 804:17, 804:22, 808:18, 867:3</p> <p><b>Supplies</b> [1] - 698:20</p> <p><b>supply</b> [39] - 682:9, 682:10, 682:24, 683:5, 684:5, 684:8, 684:11, 685:6, 686:4, 688:14, 689:23, 690:23, 695:13, 701:1, 704:1, 704:16, 704:19, 707:9, 739:7, 783:1, 786:16, 787:16, 804:19, 805:7, 805:10, 805:22, 807:24, 808:6, 808:7, 838:23, 840:12, 847:10, 856:10, 856:11, 857:15, 861:12, 862:10</p> <p><b>supplying</b> [8] - 684:2, 697:6, 704:23, 746:18, 780:13, 781:22, 807:23, 808:8</p> <p><b>support</b> [20] - 716:8, 749:21, 793:15, 806:12, 807:7, 807:11, 807:14, 807:15, 809:8, 858:3, 859:10, 863:7, 863:8, 863:10, 865:3, 865:19, 865:24, 872:6, 872:7, 875:14</p> <p><b>supported</b> [1] - 808:15</p> <p><b>supporting</b> [2] - 846:1, 858:4</p> <p><b>suppose</b> [1] - 825:8</p> <p><b>supposed</b> [3] - 670:24, 671:1, 776:20</p> <p><b>surges</b> [2] - 775:9, 803:19</p> <p><b>survey</b> [5] - 763:15, 769:11, 829:15, 829:24, 834:17</p> <p><b>surveyed</b> [1] - 714:23</p> <p><b>surveys</b> [2] - 828:15, 829:11</p>	<p><b>survived</b> [2] - 816:24, 824:18</p> <p><b>suspected</b> [1] - 804:1</p> <p><b>suspicion</b> [1] - 755:19</p> <p><b>suspicious</b> [1] - 786:20</p> <p><b>sustained</b> [2] - 725:14, 725:22</p> <p><b>swear</b> [4] - 670:18, 671:3, 673:5, 673:23</p> <p><b>swearing</b> [5] - 672:6, 674:11, 675:22, 678:5, 679:2</p> <p><b>switch</b> [5] - 693:15, 695:11, 696:10, 739:2, 746:16</p> <p><b>switches</b> [2] - 695:15, 771:10</p> <p><b>switching</b> [5] - 734:14, 775:6, 775:8, 803:19, 863:18</p> <p><b>sworn</b> [13] - 670:10, 670:16, 671:3, 671:9, 671:16, 671:17, 671:20, 671:24, 673:23, 675:10, 675:13, 679:5, 869:9</p> <p><b>System</b> [3] - 705:17, 817:9, 818:3</p> <p><b>system</b> [176] - 680:22, 681:12, 681:17, 681:20, 682:17, 683:2, 683:5, 683:10, 683:17, 684:11, 684:14, 684:19, 685:1, 685:2, 685:3, 685:4, 685:8, 687:5, 687:6, 687:7, 687:18, 687:21, 688:8, 688:22, 688:23, 689:6, 689:12, 689:13, 689:15, 689:16, 692:19, 693:24, 695:5, 695:17, 696:13, 696:14, 707:18, 711:13, 711:14, 711:22, 712:1, 713:4, 717:9, 722:1, 722:17, 725:20, 726:4, 730:20, 732:19, 732:20, 737:6, 738:14, 741:19, 742:1, 742:20, 742:21, 743:6, 743:18, 745:18, 745:22,</p>	<p>747:5, 747:9, 747:11, 747:19, 748:1, 748:14, 749:5, 749:6, 749:17, 750:11, 750:12, 750:20, 751:5, 751:24, 752:2, 752:6, 752:7, 752:11, 752:17, 753:7, 755:7, 756:23, 757:11, 759:23, 762:24, 767:21, 767:24, 768:6, 773:20, 777:16, 777:18, 777:20, 777:24, 780:21, 781:23, 786:5, 786:23, 787:22, 788:9, 801:24, 802:23, 806:18, 816:22, 816:23, 817:4, 817:24, 820:2, 820:7, 820:9, 820:15, 825:10, 825:15, 834:23, 835:10, 835:14, 836:3, 836:5, 836:7, 836:8, 838:20, 840:1, 845:4, 845:9, 849:19, 849:22, 850:10, 850:11, 852:5, 852:11, 852:13, 852:15, 852:16, 852:19, 853:7, 855:23, 858:4, 860:11, 861:5, 861:16, 861:17, 861:19, 861:23, 862:8, 863:21, 864:14, 864:16, 864:23, 865:3, 865:5, 865:20, 867:14, 868:5, 870:11, 871:7, 872:8, 872:14, 873:21, 873:22, 873:24, 875:2, 875:3, 878:15, 881:23, 884:6, 884:7, 884:9, 884:20, 884:24, 886:21, 887:7</p> <p><b>Systems</b> [1] - 677:14</p> <p><b>systems</b> [22] - 685:10, 685:11, 685:14, 732:4, 732:5, 744:3, 756:24, 764:17, 764:19, 774:20, 787:13, 788:24, 806:3, 834:21,</p>
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850:22, 853:11, 864:5, 875:21, 884:11, 884:17, 884:18, 885:2 <b>systemwide</b> [2] - 778:1, 826:11 <b>Systemwide</b> [1] - 778:2	764:22, 778:10, 784:19, 821:11, 835:18, 896:3 <b>Technical</b> [1] - 667:10 <b>technically</b> [2] - 823:6, 836:5 <b>technicians</b> [2] - 733:2, 735:24 <b>Technology</b> [1] - 749:12 <b>technology</b> [6] - 749:16, 749:20, 773:6, 802:5, 836:8, 837:2 <b>telemetered</b> [1] - 719:20 <b>telemetering</b> [1] - 712:7 <b>telemetry</b> [9] - 722:20, 738:5, 745:16, 745:17, 745:23, 757:11, 770:16, 786:10, 788:9 <b>telephone</b> [1] - 694:16 <b>telephonically</b> [1] - 869:10 <b>temperature</b> [20] - 718:10, 718:11, 718:16, 744:12, 745:19, 745:20, 746:15, 792:12, 810:20, 810:24, 811:8, 811:18, 811:21, 811:22, 812:21, 816:4, 839:15, 839:16, 855:9, 856:2 <b>temperatures</b> [2] - 709:1, 816:18 <b>temporarily</b> [1] - 793:24 <b>temporary</b> [2] - 782:22, 793:19 <b>Ten</b> [2] - 704:16, 834:4 <b>ten</b> [24] - 689:14, 696:7, 704:15, 708:11, 709:17, 747:16, 765:24, 805:10, 813:22, 813:24, 832:13, 833:15, 833:21, 834:3, 837:7, 839:9, 852:13, 853:3, 857:17, 866:16, 880:17, 891:21, 892:2 <b>ten-year</b> [2] - 813:22, 857:17 <b>tenants</b> [1] - 828:4 <b>tends</b> [1] - 861:11	<b>tenor</b> [1] - 673:7 <b>tension</b> [5] - 734:7, 734:9, 736:2, 809:18 <b>tenth</b> [21] - 704:13, 706:16, 708:5, 708:6, 708:8, 709:9, 709:21, 709:23, 719:13, 721:16, 722:19, 723:10, 723:12, 724:19, 737:4, 766:1, 831:24, 838:20, 839:2, 839:7, 840:20 <b>term</b> [10] - 727:5, 727:7, 727:9, 728:14, 730:18, 750:18, 829:17, 831:23, 835:2, 850:20 <b>terminals</b> [1] - 805:20 <b>termination</b> [2] - 696:2, 696:15 <b>terminology</b> [1] - 768:3 <b>terms</b> [23] - 709:15, 714:12, 719:17, 729:14, 737:3, 779:21, 783:12, 804:16, 807:23, 808:24, 810:16, 812:3, 821:9, 826:6, 829:11, 842:19, 857:7, 873:19, 882:2, 891:9, 892:16, 893:6, 894:15 <b>terribly</b> [3] - 694:24, 833:6 <b>territory</b> [4] - 689:22, 819:6, 874:20, 874:22 <b>test</b> [4] - 676:8, 742:9, 742:13, 874:9 <b>tested</b> [3] - 718:17, 733:17, 791:17 <b>testimony</b> [7] - 671:16, 671:17, 671:20, 672:13, 672:16, 672:22, 673:21 <b>testing</b> [3] - 796:11, 825:5, 876:17 <b>tests</b> [3] - 825:9, 825:17, 825:19 <b>themselves</b> [3] - 783:10, 817:18, 837:18 <b>theoretically</b> [1] - 807:2 <b>therefore</b> [1] - 673:22	<b>thereof</b> [1] - 746:8 <b>thermostat</b> [1] - 818:24 <b>thin</b> [1] - 709:9 <b>thinking</b> [8] - 756:20, 781:6, 812:19, 814:18, 833:12, 846:5, 850:17, 854:10 <b>Third</b> [1] - 679:24 <b>third</b> [6] - 685:2, 699:17, 699:18, 707:19, 713:18, 895:19 <b>thorough</b> [1] - 790:16 <b>thoroughfare</b> [1] - 758:11 <b>thoughts</b> [2] - 772:8, 839:5 <b>thousand</b> [3] - 689:2, 691:7, 756:22 <b>thousands</b> [1] - 732:21 <b>threat</b> [1] - 727:5 <b>Three</b> [2] - 668:3, 811:24 <b>three</b> [56] - 683:23, 684:7, 685:7, 687:1, 691:2, 691:21, 691:24, 692:1, 696:7, 697:6, 697:7, 699:6, 702:5, 702:19, 706:20, 707:4, 709:7, 709:10, 714:5, 716:5, 732:5, 732:7, 743:17, 743:19, 756:22, 770:8, 770:9, 772:19, 773:14, 780:12, 785:21, 786:2, 786:13, 787:7, 787:18, 787:23, 788:2, 788:7, 790:3, 790:21, 811:10, 814:21, 820:21, 839:20, 839:23, 841:23, 854:10, 858:8, 865:23, 876:10, 876:12, 879:22, 889:6, 893:20 <b>Three-day</b> [1] - 811:24 <b>three-fold</b> [1] - 691:2 <b>three-way</b> [1] - 841:23 <b>three-year</b> [4] - 811:10, 820:21, 889:6, 893:20 <b>throughout</b> [11] - 695:18, 696:13,	696:14, 704:6, 719:12, 721:10, 733:3, 759:14, 808:1, 843:16, 860:11 <b>Thursday</b> [28] - 706:19, 706:20, 710:2, 714:15, 714:17, 714:19, 714:23, 755:10, 755:16, 756:11, 756:15, 756:17, 757:5, 757:18, 757:19, 757:24, 758:18, 759:22, 760:2, 763:16, 769:11, 771:1, 828:15, 834:17, 834:18, 836:20, 851:4 <b>ticket</b> [2] - 884:3, 884:5 <b>tilting</b> [1] - 792:22 <b>Tim</b> [3] - 678:3, 779:14, 779:17 <b>timing</b> [1] - 798:10 <b>today</b> [23] - 670:9, 670:22, 671:7, 676:5, 676:14, 679:16, 680:23, 681:14, 684:10, 692:3, 729:16, 784:23, 790:7, 804:18, 822:16, 826:18, 840:23, 875:6, 878:10, 895:4, 895:8, 896:4 <b>Today</b> [2] - 803:19, 895:16 <b>today's</b> [4] - 670:6, 672:15, 676:17, 680:20 <b>together</b> [11] - 686:4, 691:23, 694:17, 733:18, 758:8, 769:22, 770:3, 834:23, 884:11, 891:14, 892:23 <b>Tom</b> [3] - 719:10, 755:21, 756:9 <b>tomorrow</b> [4] - 880:21, 895:13, 896:1, 896:5 <b>took</b> [18] - 672:11, 714:5, 718:23, 725:9, 728:4, 732:1, 735:3, 738:8, 742:23, 747:3, 747:16, 806:21, 830:9, 846:1,
<b>T</b>				
<b>T&amp;D</b> [4] - 820:2, 871:17, 871:20, 871:22 <b>T.V</b> [1] - 823:4 <b>TA</b> [1] - 844:1 <b>table</b> [2] - 876:19, 889:23 <b>tabulating</b> [1] - 836:23 <b>talks</b> [2] - 738:13, 816:4 <b>Tap</b> [1] - 856:10 <b>tap</b> [11] - 686:12, 801:11, 801:12, 801:15, 856:7, 856:14, 856:19, 856:22, 857:1, 857:8 <b>tapping</b> [1] - 684:5 <b>taps</b> [3] - 859:16, 859:17, 859:19 <b>target</b> [2] - 827:7, 852:9 <b>targeted</b> [5] - 805:24, 817:13, 817:24, 826:11, 826:19 <b>targets</b> [4] - 797:2, 797:3, 797:4, 858:23 <b>tariffs</b> [1] - 820:18 <b>task</b> [3] - 710:3, 747:3, 834:13 <b>tasks</b> [1] - 873:9 <b>Taylor</b> [3] - 678:3, 779:14, 779:17 <b>TAYLOR</b> [9] - 779:16, 785:16, 794:3, 795:4, 804:10, 807:18, 807:22, 808:17, 808:23 <b>team</b> [4] - 680:11, 770:7, 830:3, 877:10 <b>tech</b> [1] - 788:14 <b>technical</b> [23] - 670:6, 670:24, 671:14, 671:19, 672:5, 672:6, 672:14, 672:15, 672:16, 672:17, 672:19, 672:22, 673:5, 673:23, 674:15, 674:22, 700:14,				

<p>852:12, 883:14, 884:16</p> <p><b>tool</b> [1] - 836:11</p> <p><b>tools</b> [1] - 732:22</p> <p><b>top</b> [10] - 718:10, 744:13, 745:18, 792:3, 792:9, 792:17, 832:5, 839:1, 876:19, 880:2</p> <p><b>topic</b> [3] - 795:7, 795:8, 795:10</p> <p><b>Total</b> [2] - 823:1, 891:20</p> <p><b>total</b> [17] - 709:19, 710:11, 714:14, 714:16, 716:18, 720:9, 725:19, 725:24, 777:23, 781:9, 822:24, 887:18, 888:3, 888:4, 891:19, 891:21, 895:16</p> <p><b>totally</b> [1] - 833:4</p> <p><b>touch</b> [5] - 739:20, 746:21, 799:5, 845:7, 890:3</p> <p><b>touches</b> [2] - 875:5, 875:12</p> <p><b>tougher</b> [1] - 826:24</p> <p><b>toward</b> [2] - 686:16, 826:19</p> <p><b>towards</b> [2] - 787:12, 805:24</p> <p><b>tower</b> [1] - 805:15</p> <p><b>tracking</b> [2] - 696:21, 885:22</p> <p><b>traffic</b> [2] - 710:24, 758:11</p> <p><b>train</b> [1] - 828:18</p> <p><b>trained</b> [3] - 693:9, 699:14, 875:15</p> <p><b>training</b> [2] - 874:1, 874:7</p> <p><b>trains</b> [4] - 808:9, 844:10, 844:11, 875:19</p> <p><b>transcribed</b> [1] - 672:8</p> <p><b>transfer</b> [6] - 731:7, 806:12, 806:16, 806:21, 814:3, 867:5</p> <p><b>transformed</b> [1] - 681:16</p> <p><b>transformer</b> [53] - 682:21, 686:7, 686:8, 687:24, 692:24, 696:2, 696:3, 696:6, 696:18, 696:19, 718:6, 719:18, 721:19, 724:23,</p>	<p>724:24, 727:24, 728:1, 730:6, 732:17, 738:23, 739:8, 739:11, 741:7, 741:18, 742:10, 743:4, 743:10, 743:16, 746:2, 746:5, 746:11, 746:12, 746:14, 747:12, 750:13, 764:23, 776:10, 780:9, 781:7, 781:8, 782:3, 783:6, 785:11, 797:18, 797:20, 801:11, 803:20, 830:17, 834:24, 841:7, 891:3, 891:10</p> <p><b>transformers</b> [69] - 682:11, 683:14, 683:18, 690:23, 692:16, 695:14, 700:6, 701:1, 702:2, 707:12, 708:12, 709:16, 712:6, 717:11, 718:5, 718:6, 718:9, 718:14, 726:4, 727:20, 727:21, 731:15, 741:13, 741:20, 741:24, 742:4, 742:5, 742:14, 742:15, 742:16, 743:2, 743:6, 743:7, 743:15, 743:22, 744:2, 744:4, 744:6, 744:11, 744:15, 744:19, 745:4, 745:5, 745:11, 745:15, 746:7, 750:21, 771:17, 779:23, 779:24, 780:2, 780:19, 781:5, 781:12, 782:16, 787:1, 788:15, 797:17, 801:18, 810:6, 840:6, 840:7, 852:14, 853:3, 857:10, 859:20, 871:7, 881:16, 882:23</p> <p><b>Transformers</b> [1] - 708:11</p> <p><b>TransGas</b> [1] - 677:13</p> <p><b>TransGas</b>.....</p> <p>..855 [1] - 897:8</p> <p><b>transience</b> [2] - 804:2, 804:3</p>	<p><b>Transit</b> [11] - 767:9, 842:14, 843:19, 844:9, 845:1, 845:4, 845:18, 845:21, 845:24, 846:9, 846:10</p> <p><b>transition</b> [2] - 854:13, 854:17</p> <p><b>transmission</b> [11] - 681:17, 681:19, 695:17, 780:4, 817:24, 865:5, 865:11, 865:20, 872:6, 879:16</p> <p><b>transmitted</b> [1] - 840:1</p> <p><b>transmitter</b> [1] - 750:4</p> <p><b>transmitters</b> [1] - 748:21</p> <p><b>transmitting</b> [1] - 802:20</p> <p><b>transport</b> [1] - 842:14</p> <p><b>transportation</b> [4] - 711:4, 831:14, 843:4, 845:9</p> <p><b>travel</b> [3] - 694:14, 694:15, 865:18</p> <p><b>treating</b> [1] - 894:6</p> <p><b>treatment</b> [2] - 843:15, 889:12</p> <p><b>tremendous</b> [1] - 831:20</p> <p><b>Triboro</b> [1] - 690:7</p> <p><b>trickle</b> [2] - 740:6, 740:7</p> <p><b>tried</b> [2] - 698:13, 699:18</p> <p><b>trigger</b> [3] - 728:19, 740:7, 829:22</p> <p><b>triggered</b> [2] - 726:18, 859:6</p> <p><b>trip</b> [5] - 698:18, 698:20, 698:21, 790:9</p> <p><b>triple</b> [1] - 871:19</p> <p><b>tripping</b> [1] - 789:17</p> <p><b>trips</b> [1] - 711:17</p> <p><b>trouble</b> [6] - 713:5, 714:12, 726:20, 833:23, 844:3, 844:5</p> <p><b>troubles</b> [1] - 850:20</p> <p><b>truck</b> [2] - 836:10</p> <p><b>true</b> [7] - 711:9, 766:9, 779:2, 829:9, 834:9, 889:14, 894:15</p> <p><b>truism</b> [1] - 894:15</p> <p><b>truth</b> [2] - 670:18, 673:24</p> <p><b>try</b> [11] - 732:3, 733:3, 757:9, 775:18, 828:22, 829:3,</p>	<p>840:18, 840:19, 884:23, 892:18, 893:9</p> <p><b>Try</b> [1] - 846:17</p> <p><b>trying</b> [27] - 723:21, 740:16, 749:16, 750:1, 750:8, 759:8, 761:2, 768:7, 771:12, 773:16, 788:16, 788:17, 800:6, 809:2, 844:12, 845:8, 847:23, 851:19, 855:24, 856:3, 863:22, 878:4, 881:13, 882:1, 883:12, 885:21, 892:24</p> <p><b>Trying</b> [1] - 773:2</p> <p><b>tube</b> [1] - 700:11</p> <p><b>Tuesday</b> [36] - 692:6, 702:21, 704:10, 706:5, 706:9, 708:5, 708:8, 708:23, 714:14, 717:4, 718:7, 718:23, 719:11, 720:23, 721:7, 722:19, 729:11, 729:13, 731:2, 731:5, 766:2, 766:4, 766:6, 766:7, 766:10, 766:12, 806:6, 806:19, 833:20, 836:21, 839:7, 841:14, 842:16, 867:22</p> <p><b>tunnel</b> [1] - 690:6</p> <p><b>turbines</b> [1] - 866:3</p> <p><b>turn</b> [2] - 670:11, 691:13</p> <p><b>turned</b> [1] - 810:12</p> <p><b>turning</b> [3] - 749:18, 818:23, 863:11</p> <p><b>twice</b> [1] - 833:20</p> <p><b>two</b> [111] - 674:16, 678:1, 678:5, 684:11, 684:13, 684:14, 685:10, 688:8, 690:11, 694:7, 694:9, 694:22, 695:1, 695:2, 695:4, 695:7, 697:4, 702:19, 703:1, 705:12, 706:22, 707:4, 707:21, 708:20, 710:21, 712:19, 713:1, 719:3, 731:3, 737:13, 746:22, 748:21, 749:9,</p>	<p>750:4, 750:5, 756:22, 765:20, 765:21, 772:18, 773:6, 777-2, 777-5, 777-6, 777-12, 777-13, 777-20, 777-22, 780:3, 780:14, 780:18, 790:8, 790:17, 790:18, 790:19, 791:11, 793:1, 797:23, 799:19, 800:14, 805:2, 807:15, 807:17, 808:7, 808:17, 811:2, 811:12, 811:13, 812:23, 812:24, 814:15, 816:8, 818:20, 822:14, 824:2, 824:3, 824:4, 824:7, 824:13, 824:15, 826:16, 831:3, 834:4, 835:23, 836:20, 840:13, 841:14, 843:8, 846:6, 846:12, 854:10, 858:8, 861:3, 862:9, 865:23, 868:24, 872:1, 872:23, 874:14, 875:11, 877:12, 880:8, 882:22, 883:14, 883:18, 884:11, 890:1, 890:19</p> <p><b>Two</b> [2] - 772:20, 780:23</p> <p><b>two-megawatt</b> [1] - 807:15</p> <p><b>two-way</b> [1] - 843:8</p> <p><b>two-year</b> [2] - 811:12, 811:13</p> <p><b>tying</b> [1] - 855:21</p> <p><b>type</b> [14] - 684:23, 684:24, 694:14, 751:5, 751:19, 752:7, 752:21, 753:4, 759:21, 785:21, 793:4, 818:2, 853:11, 889:10</p> <p><b>types</b> [2] - 811:6, 818:20</p> <p><b>typical</b> [2] - 696:3, 782:8</p> <p><b>typically</b> [3] - 695:9, 861:15, 861:20</p>
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<p style="text-align: center;"><b>U</b></p> <p><b>ultimate</b> [3] - 725:14, 842:2, 852:7</p> <p><b>ultimately</b> [4] - 706:22, 742:2, 742:6, 835:3</p> <p><b>unacceptable</b> [1] - 833:2</p> <p><b>unaffected</b> [1] - 710:13</p> <p><b>unclear</b> [1] - 813:5</p> <p><b>uncommon</b> [2] - 860:7, 860:12</p> <p><b>under</b> [16] - 681:5, 684:1, 685:10, 732:9, 741:12, 749:8, 750:1, 750:2, 774:13, 776:11, 819:18, 820:19, 856:14, 859:3, 859:8, 873:18</p> <p><b>Under</b> [1] - 894:8</p> <p><b>underestimated</b> [3] - 756:13, 759:12, 760:3</p> <p><b>underestimating</b> [2] - 714:16, 757:1</p> <p><b>underground</b> [13] - 684:19, 684:20, 686:3, 692:20, 696:3, 696:12, 716:15, 716:16, 742:21, 835:14, 862:8, 864:8, 875:3</p> <p><b>underload</b> [1] - 808:22</p> <p><b>underlying</b> [1] - 732:8</p> <p><b>undersized</b> [2] - 863:16, 864:5</p> <p><b>understood</b> [3] - 701:13, 833:18, 892:19</p> <p><b>Understood</b> [1] - 868:7</p> <p><b>undertake</b> [1] - 751:18</p> <p><b>undertaken</b> [3] - 710:5, 874:18, 874:19</p> <p><b>undertook</b> [2] - 747:3, 749:2</p> <p><b>unfaulted</b> [1] - 775:13</p> <p><b>unfortunately</b> [1] - 844:11</p> <p><b>Unfortunately</b> [1] - 733:24</p> <p><b>unique</b> [1] - 747:6</p> <p><b>uniqueness</b> [1] - 764:7</p> <p><b>unit</b> [2] - 696:12, 754:19</p>	<p><b>units</b> [6] - 746:20, 748:7, 866:9, 866:12, 878:18, 884:10</p> <p><b>university</b> [1] - 745:7</p> <p><b>unknowing</b> [1] - 832:9</p> <p><b>unless</b> [3] - 728:11, 861:21, 889:8</p> <p><b>Unless</b> [1] - 861:18</p> <p><b>unlikely</b> [1] - 857:6</p> <p><b>unprecedented</b> [9] - 831:23, 832:17, 832:18, 832:19, 832:20, 851:8, 851:10, 851:16, 893:4</p> <p><b>unrelated</b> [4] - 691:21, 693:5, 695:12, 699:18</p> <p><b>unreliable</b> [2] - 733:7, 736:15</p> <p><b>unstable</b> [1] - 716:19</p> <p><b>unusual</b> [11] - 691:21, 692:3, 692:4, 694:3, 694:24, 697:23, 699:17, 700:15, 733:15, 839:3, 861:18</p> <p><b>up</b> [134] - 681:16, 684:2, 690:1, 690:11, 692:12, 692:16, 697:2, 697:3, 697:5, 697:11, 698:1, 698:14, 699:21, 700:11, 703:4, 703:11, 703:22, 705:5, 705:8, 705:20, 707:1, 707:8, 708:15, 709:9, 710:6, 712:17, 712:22, 714:20, 715:21, 716:7, 719:17, 725:20, 726:4, 729:22, 730:13, 730:14, 730:20, 735:2, 746:1, 749:4, 749:18, 750:7, 750:11, 750:16, 752:8, 752:15, 753:1, 754:2, 755:10, 756:18, 760:12, 760:14, 760:17, 760:18, 760:23, 761:4, 761:7, 761:17, 762:22, 764:8, 764:11, 764:17, 765:10, 766:6,</p>	<p>768:5, 778:11, 783:5, 785:18, 786:8, 786:18, 789:6, 792:7, 797:5, 804:16, 804:21, 805:15, 805:18, 805:21, 805:22, 809:21, 816:3, 818:6, 819:3, 819:9, 819:12, 827:4, 828:16, 829:4, 833:9, 834:18, 835:15, 839:17, 840:7, 847:5, 847:7, 847:9, 847:13, 848:15, 848:19, 849:6, 850:21, 850:22, 852:20, 854:14, 856:23, 857:2, 859:12, 872:1, 877:11, 877:22, 878:5, 878:19, 879:5, 880:1, 880:11, 880:21, 881:21, 884:12, 884:24, 885:9, 890:1, 890:2, 891:22, 893:10, 894:14, 894:15, 895:13, 895:15, 895:18</p> <p><b>update</b> [2] - 813:22, 874:2</p> <p><b>updated</b> [1] - 846:12</p> <p><b>upgrade</b> [3] - 860:13, 871:6, 871:14</p> <p><b>upgrading</b> [1] - 749:20</p> <p><b>ups</b> [1] - 868:12</p> <p><b>urgent</b> [1] - 772:11</p> <p><b>US</b> [4] - 678:20, 688:10, 688:11, 689:19</p> <p><b>usage</b> [1] - 828:9</p> <p><b>useful</b> [4] - 762:2, 823:18, 853:4, 873:15</p> <p><b>users</b> [3] - 768:5, 842:13, 842:14</p> <p><b>uses</b> [5] - 704:23, 751:4, 752:1, 811:11, 850:10</p> <p><b>usual</b> [2] - 730:23, 837:16</p> <p><b>utilities</b> [8] - 675:5, 688:11, 688:14, 689:18, 716:13, 747:7, 811:12</p> <p><b>utility</b> [3] - 751:16, 753:17, 824:15</p>	<p><b>Utility</b> [4] - 667:8, 669:1, 669:2, 678:13</p> <p><b>utilization</b> [1] - 682:13</p> <p><b>utilize</b> [1] - 738:8</p> <p><b>utilized</b> [1] - 672:8</p> <p><b>utilizing</b> [1] - 782:14</p> <p style="text-align: center;"><b>V</b></p> <p><b>vague</b> [1] - 713:20</p> <p><b>valleys</b> [1] - 706:11</p> <p><b>value</b> [4] - 779:7, 810:19, 812:3, 873:12</p> <p><b>valued</b> [1] - 833:7</p> <p><b>van</b> [3] - 752:24, 753:7, 753:9</p> <p><b>vans</b> [1] - 706:6</p> <p><b>VAR</b> [9] - 858:3, 858:24, 859:10, 863:7, 864:18, 865:19, 865:21, 865:24</p> <p><b>variable</b> [6] - 810:20, 810:24, 811:9, 811:18, 812:7, 812:21</p> <p><b>various</b> [5] - 793:7, 808:4, 843:9, 884:13, 884:18</p> <p><b>VARS</b> [6] - 865:4, 865:7, 865:15, 865:16, 865:18, 866:6</p> <p><b>vast</b> [4] - 712:11, 832:9, 832:10, 865:19</p> <p><b>vastly</b> [2] - 714:16, 760:3</p> <p><b>vaults</b> [1] - 720:10</p> <p><b>vehicle</b> [1] - 820:13</p> <p><b>vehicles</b> [1] - 717:10</p> <p><b>vein</b> [1] - 878:13</p> <p><b>vendors</b> [5] - 748:21, 750:5, 750:6, 818:21, 853:23</p> <p><b>vented</b> [1] - 890:15</p> <p><b>venture</b> [4] - 710:19, 877:1, 877:2, 877:14</p> <p><b>verified</b> [1] - 761:13</p> <p><b>verify</b> [1] - 746:17</p> <p><b>Verizon</b> [2] - 674:20, 749:11</p> <p><b>version</b> [9] - 693:20, 695:20, 752:24, 763:15, 764:3, 790:12, 818:19, 875:6, 879:6</p> <p><b>versions</b> [3] - 749:21, 751:12, 818:9</p>	<p><b>versus</b> [3] - 723:17, 834:17, 882:7</p> <p><b>vibration</b> [1] - 792:12</p> <p><b>vice</b> [13] - 677:23, 680:6, 680:8, 680:19, 719:10, 755:21, 842:4, 845:15, 849:19, 869:23, 870:1, 870:3</p> <p><b>video</b> [2] - 755:13, 769:6</p> <p><b>view</b> [7] - 676:6, 685:18, 816:13, 855:24, 862:15, 868:4, 894:14</p> <p><b>violation</b> [1] - 673:4</p> <p><b>visited</b> [1] - 675:16</p> <p><b>visualize</b> [1] - 834:22</p> <p><b>vitals</b> [1] - 743:15</p> <p><b>void</b> [1] - 764:20</p> <p><b>volt</b> [7] - 683:6, 683:11, 685:4, 685:22, 685:24, 768:19, 808:8</p> <p><b>voltage</b> [124] - 681:16, 682:2, 682:12, 682:13, 682:21, 686:9, 696:10, 705:22, 705:24, 771:17, 771:21, 773:22, 774:7, 775:13, 786:10, 786:15, 786:22, 787:10, 787:14, 787:21, 788:6, 788:19, 795:8, 795:14, 796:16, 797:7, 797:8, 797:9, 799:6, 799:9, 799:14, 799:15, 800:3, 800:6, 800:12, 800:13, 800:14, 800:16, 800:18, 801:2, 801:5, 801:9, 801:13, 801:16, 801:19, 801:20, 801:22, 802:8, 802:17, 803:5, 803:17, 806:9, 821:20, 822:13, 822:23, 833:7, 836:16, 848:14, 848:21, 848:23, 855:18, 855:21, 855:23, 856:7, 856:8, 856:9, 856:15, 856:16, 856:23, 857:2, 857:22, 857:23,</p>
--	--	--	---	---

859:2, 859:4, 859:5, 859:11, 859:13, 859:14, 859:22, 859:24, 860:3, 860:8, 860:12, 860:14, 860:15, 860:16, 860:17, 860:18, 860:22, 860:23, 861:3, 861:10, 861:12, 861:14, 862:2, 862:4, 862:11, 862:13, 862:18, 862:21, 863:1, 863:7, 863:9, 863:15, 863:21, 864:1, 864:3, 864:12, 864:14, 864:15, 864:17, 864:19, 865:3, 865:17, 867:22, 868:2, 868:6, 868:8, 868:11, 868:16 <b>Voltage</b> [1] - 799:6 <b>volts</b> [16] - 682:4, 682:13, 682:22, 686:9, 686:10, 703:10, 703:14, 785:23, 786:1, 786:2, 786:10, 787:4, 787:5, 787:14, 788:4, 835:2 <b>volume</b> [1] - 769:23 <b>volumes</b> [4] - 881:15, 882:2, 883:3, 886:19 <b>voluntarily</b> [1] - 705:21 <b>voluntary</b> [3] - 818:8, 818:11, 818:17 <b>volunteer</b> [1] - 818:6 <b>vulnerable</b> [2] - 824:21, 824:24	725:17, 725:23, 726:10, 726:16, 726:17, 749:1, 749:2, 838:15, 852:10, 875:23 <b>water</b> [3] - 694:16, 734:15, 807:11 <b>watts</b> [3] - 686:22, 690:18, 690:19 <b>wave</b> [11] - 700:16, 700:20, 784:13, 784:23, 784:24, 785:3, 797:9, 816:5, 816:10 <b>waves</b> [2] - 819:19, 875:17 <b>ways</b> [9] - 674:17, 731:4, 745:12, 745:13, 750:11, 780:3, 780:23, 799:19 <b>weakest</b> [1] - 737:10 <b>weapons</b> [2] - 877:9, 877:10 <b>weather</b> [7] - 684:23, 810:16, 810:19, 811:6, 812:5, 812:6, 812:20 <b>Wednesday</b> [24] - 702:21, 706:10, 706:16, 708:6, 709:21, 709:23, 713:15, 714:15, 714:17, 718:23, 735:10, 735:11, 757:17, 766:7, 766:11, 769:20, 770:5, 770:12, 770:24, 833:21, 836:20, 836:21, 841:14, 846:1 <b>week</b> [13] - 702:20, 706:15, 710:14, 729:6, 740:14, 741:1, 741:18, 761:6, 816:18, 825:14, 866:10, 866:13, 875:18 <b>weekend</b> [2] - 733:3, 816:21 <b>weeks</b> [4] - 731:6, 774:4, 883:14, 883:18 <b>weight</b> [3] - 676:4, 676:9, 850:14 <b>weighted</b> [1] - 811:24 <b>west</b> [3] - 690:6, 805:9, 806:13 <b>Westchester</b> [18] - 686:23, 688:23,	689:23, 716:6, 730:4, 752:15, 754:6, 754:11, 754:12, 754:13, 754:20, 754:21, 762:15, 763:1, 763:3, 763:9, 878:17 <b>Western</b> [4] - 669:7, 678:15, 821:2, 826:3 <b>wet</b> [4] - 811:3, 811:18, 811:20, 811:23 <b>whatsoever</b> [2] - 673:22, 822:13 <b>wheels</b> [1] - 697:15 <b>whereas</b> [2] - 828:9, 872:16 <b>White</b> [2] - 668:23, 677:22 <b>white</b> [1] - 690:2 <b>whole</b> [11] - 722:2, 758:13, 758:22, 773:21, 785:4, 786:5, 796:9, 840:10, 862:14, 878:16, 884:7 <b>wide</b> [1] - 878:2 <b>widespread</b> [2] - 759:9, 759:17 <b>William</b> [1] - 668:21 <b>winded</b> [1] - 750:3 <b>windows</b> [1] - 833:9 <b>wire</b> [1] - 864:9 <b>wired</b> [1] - 794:6 <b>wiring</b> [4] - 794:4, 794:7, 794:24 <b>wish</b> [2] - 672:9, 805:22 <b>withstand</b> [1] - 695:1 <b>witness</b> [2] - 672:11, 672:22 <b>witnesses</b> [4] - 670:16, 672:16, 674:11, 678:1 <b>WOLF</b> [17] - 731:20, 732:4, 732:5, 732:8, 732:9, 732:11, 733:2, 733:9, 733:14, 735:5, 735:9, 735:10, 735:18, 737:2 <b>wonder</b> [1] - 854:20 <b>wondered</b> [1] - 832:2 <b>wondering</b> [2] - 772:8, 826:6 <b>wood</b> [1] - 778:6 <b>wooden</b> [1] - 778:17 <b>Woodside</b> [1] - 758:19 <b>word</b> [4] - 756:5, 803:3, 846:22, 851:6	<b>WORDEN</b> [16] - 718:1, 731:16, 731:19, 754:4, 763:12, 765:9, 767:1, 767:14, 767:20, 768:7, 768:22, 778:12, 779:8, 880:17, 881:1, 895:1 <b>Worden</b> [2] - 677:19, 717:22 <b>wording</b> [1] - 813:4 <b>words</b> [6] - 739:6, 747:10, 774:20, 822:18, 840:2, 841:5 <b>workout</b> [2] - 716:7, 756:16 <b>works</b> [1] - 888:20 <b>worse</b> [3] - 723:19, 775:15, 851:2 <b>worst</b> [2] - 695:2, 851:1 <b>worth</b> [1] - 880:16 <b>worthwhile</b> [1] - 675:6 <b>Wow</b> [1] - 823:8 <b>written</b> [5] - 711:8, 802:5, 802:10, 847:20, 854:21	748:9, 750:19, 751:1, 764:10, 773:14, 813:24, 838:12, 851:11, 851:14, 852:13, 854:10, 877:15, 881:9, 882:22, 884:21, 890:1, 890:19, 892:11, 894:11 <b>yellow</b> [3] - 690:8, 879:23, 880:10 <b>yesterday</b> [2] - 670:14, 730:22 <b>yielding</b> [1] - 866:18 <b>YORK</b> [1] - 667:1 <b>York</b> [46] - 667:5, 667:7, 667:11, 668:3, 668:4, 668:5, 668:9, 668:12, 668:15, 668:18, 668:19, 668:21, 668:24, 669:3, 669:6, 677:11, 677:16, 677:21, 677:23, 678:14, 679:21, 686:18, 686:23, 689:9, 689:18, 689:22, 705:17, 711:4, 734:4, 767:8, 811:11, 817:9, 820:14, 824:5, 824:13, 829:2, 866:14, 867:19, 867:20, 874:18, 895:16 <b>Yorkers</b> [1] - 691:7 <b>yourself</b> [2] - 677:5, 869:4
<b>W</b>			<b>X</b>	
			<b>X/R</b> [1] - 701:10	
			<b>Y</b>	
<b>walt</b> [1] - 813:2 <b>wake</b> [2] - 872:12, 874:16 <b>Walters</b> [2] - 668:17, 677:17 <b>WALTERS</b> [5] - 677:16, 849:12, 849:15, 854:23, 855:3 <b>wants</b> [3] - 676:16, 755:9, 871:24 <b>Warner</b> [2] - 668:7, 677:12 <b>warnings</b> [1] - 744:5 <b>Washington</b> [12] - 716:14, 725:16,			<b>year</b> [41] - 686:20, 687:2, 688:7, 688:17, 688:19, 749:23, 764:15, 775:23, 800:10, 811:10, 811:12, 811:13, 812:4, 812:8, 812:12, 812:20, 813:21, 813:22, 820:21, 857:17, 874:2, 874:3, 874:10, 874:12, 874:14, 876:16, 879:19, 881:11, 886:4, 886:5, 886:6, 886:22, 888:8, 888:9, 889:6, 889:19, 889:22, 892:8, 893:8, 893:20 <b>year's</b> [2] - 812:4, 885:22 <b>years</b> [29] - 689:5, 715:12, 715:14, 715:15, 733:21, 735:22, 740:11, 744:1, 744:7, 748:3,	<b>zero</b> [1] - 822:12 <b>zones</b> [2] - 716:5, 716:10
				<b>Z</b>