Checklist Intro – 00:00

So this is the control room operating checklist. Okay. These are going to change. This is from November. We kind of put this together and finalized it for you. We're trying to keep this as simplified as possible and then we'll add a SOPs behind it. Standard operating procedures behind it so that you can function fully in your role. And so I do not expect you to be able to make super critical decisions.

Day one. I am expecting there will be a little bit of a break-in period and I am expecting in a few months you will not need much help. And so but I do want to know a couple of key things and I want to know that we've at least put the tools in front of you to be successful.

And so if these are not helpful to you after the first couple of weeks. I do want some feedback on them. We put this together, not necessarily in haste, but we put this together trying to make it in a format that we thought would be most useful to you in your capacity as a new entry level control room operator.

Call Script – 01:14

So the first page of this is the call script. One of the things that you will be doing is you will be fielding phone calls from the system operator or the control room operator phone that is going to be mostly calls forwarded from our 24/7 number. So if you're getting tons of spam calls, it's probably because of the phone numbers recycled.

But very, very likely you're going to be getting calls from the Goldwind remote operations center. So we talked about a few things and we'll continue to talk about a few things. I know we talked about this in all of your onboarding originally or your interviews originally, that gold wind projects are projects that we built and they're under the warranty period for five to 10 to 15 years, somewhere in there.

We have two projects that are One energy owned that are not under goldwind service and maintenance. So you will not be fielding phone calls from Valfilm or Greeneville at this time via the call tree. You will be fielding phone calls from the other projects. Marion, Ottawa, Ball one, ball two a whole fleet of other projects that will be under the warranty period, which I believe Claire is putting a table together for you so you understand what projects we service and what projects are serviced externally.

So you'll be fielding a ton of phone calls if you get a phone call to your personal one energy phone that is not the control operator phone, but it is related to system operator. I want you to handle it this way as well, and I want to identify why you're getting phone calls on your personal one energy line versus the control room.

It could be because Justin or Erica knows your personal number and will call you directly to work through problems so they don't have to call the CRO number. But realistically, 90 to 99% of your phone calls are going to be through that CRO phone. So when you get an external incoming call, one energy control room, your name speaking, who am I talking to?

Internal incoming call Control room. This is your name? Those are both fine. Feel free to ad lib some stuff. Try to keep it professional, but try to have a script from external or incoming internal phone calls. Now, if you are making an outgoing external call, this is Sidney from the One Energy Control room is this. Justin? I am calling because I notice there is a communications or a grid fault at this project.

Same with the outgoing internal calls State your Reason, all normal stuff. If you are making calls, make sure it goes in the call log. We have a call log that we want kept up. Make sure that any calls, incoming or outbound, are going in the call log, because if you don't, we won't know, etc., etc.. But it would be nice to know, especially if we're going through our records when notification is set out.

So one of the KPIs a lot of other remote operations centers use to score themselves on an annual basis is what was the notification, What was the downtime, what was the uptime right, the duration between notification to team or from an issue happening to us, realizing it. That's that's one of the other durations. There are a lot of things we're trying to track with this.

We're not going to do sophisticated tracking for a period of time while we get this group kicked off, but we certainly will want to know that that information.

Shift Handoff – 04:47

So you all will not be seeing each other very often after this week, which in some cases may excite you and others may devastate you. But there will be a shift handoff.

I am expecting if you show up right on time, you might upset the other operators, show up a little bit early, a few minutes early, 5 minutes early to do this handoff. I'm not expecting this handoff to take an hour. I am expecting this handoff to be a I'm trying to get a handoff paper together so that an hour before you can start filling it out saying these projects are all in good working order.

Here is, you know, any issues I have so that they have a reference and that you might help transition the new operator to their role. Ideally, as you become familiar with what's happening. Ideally, you can just kind of leave the notes. The other person can pick up and if there's no significant issues like all the turbines are operational, it's a very easy handoff.

Everything's good. I've left everything in perfect, impeccable order. There's no weather coming in. Things are great, you know. But if there happens to be issues, it's going to take a little bit longer. And so just know that I would expect for the first couple of weeks transitioning in and out, you might want to show up a few minutes early, 5 minutes early to the control room.

I know that adds a little bit of time to your days and I do apologize for that. But until this becomes seamless, I think you'll all want that. So be respectful of other people's time, too. It's going to be really hard for one person to check out if the other person isn't there. The daytime shift will be a little bit easier.

The nighttime shifts are a little bit tougher, I can come in and cover if something's happened. You know, someone in your family is having an issue. I am happy to come in and cover that. I live 10 minutes away from here. I think there's a lot of flexibility, especially if we know we don't have coverage for a period of time.

Hey, you're going to do a check out on the system operator chat instead because Dusten, you know, hit a deer on his way into work today and he's going to be an hour late. He's waiting on the sheriff, Right. If you oversleep. Stuff like that. So, yes, it will get noted in some way and it will be sent to the system operator team.

But know that we're not going to shame you for having an issue once you know, especially if you show up regularly, normally. And so be respectful of that. So the outgoing operator before you leave, ideally you've checked all the wind turbines, all of the projects have been checked, all the substations and power systems. We only have a couple of things that I would want you to check, and they're not exactly specified right now.

So for the time being, don't worry about that. We will roll out new training when that substation is up and remote and talking. But the engineering team is currently working on our megawatt hub one, which is just down the way. I assume that you will get a tour of that if you have not already. Ensure all abnormal operations have a verbal handoff.

And so again, if you happen to be running short on time, call do some creative things. You know, make a call on your way home, something along those lines. But do make sure that the incoming operator knows that Harpster has a grid fault and that teams are going to need to be dispatched. Or that you talked to Justin in the middle of the night and he doesn't want to worry about it until 9 a.m. the next day when his team is available.

Whatever the case may be, make sure anything abnormal is handed off, weather related, things like that, so ensure all events during shifts have been logged. So if you shut down for a reason, if a turbine wasn't operating, if there was a communication issue, make sure it makes its way into the log. Ensure all open service events have a verbal handoff.

I think that is more related to anything that has not been serviced that a team might be dispatched to. Unfortunately for the daytime shift, I think most of that documentation will land on the daytime shift because we service very, very, very little in the middle of the night. I can count on two hands the amount of midnight calls I have made and gotten out of bed for, because usually they're not that important.

Usually it's a plant outage or we've had something scheduled for a very long time that is going late and occasionally that happens. Ensure all open or pending weather events are handed off. So if a turbine is iced and you are leaving it down for the next couple of hours until we get some sunlight, hopefully it can shed, you'll need to pass that off.

Hey, this turbine is down. We're going to try a controlled start at X, Y, Z time. I coordinated with the system operator team. This is our plan, right? Or if there is a tornado potentially rolling through and we're right in the storm line and we're trying to shut down in advance of that, make sure the system operator knows that, make sure that it's one of the first things that they open up and look at.

crap, that's real. That is a real storm front coming through. Ensure all standing orders are handed off again, any open items. I think this list basically comes down to if anything is flagged. Hand it off right room and desk are cleaned. I really appreciate when somebody flushes the toilet when they're done before I come in and use it.

Right. Like everybody appreciates that. I think desks are no different. Right. So, I mean, standard courtesy applies if you've eaten a disgusting meal, maybe take it outside the office that somebody is going to share. You know, if you're bringing in something absolutely horrific to eat in that room or if you have dirt clutter, it does get cleaned. And we will send somebody into vacuum that room.

Occasionally Art and the facilities team does a really, really nice job of keeping this this building clean, considering how much mud and disgusting stuff we drag in. But on that same front, if there is something you need on that front, hey, by the way, the light bulb is out in this room and nobody comes in here to check on us.

Like it would be nice to know so that we can get that fixed for you. That is a very easy fix. The stuff like that. Things to make your lives more comfortable. I think that you would be surprised at the amount of things that we all personally deal with for comfort for the staff here. It shocks me from time to time, so we will do the same for you.

You are a very valuable member of our team. We've been wanting this for a very long time. Phone in place, tablet in place, make sure stuff's charged. Make sure that you're not handing off a problem to somebody else. And pretty much that's it. So the incoming operator, you need to record the the handoff I signed in at. And even if you're late, it doesn't matter.

It's extreme flexibility here to a fault. We try to make things easy. We are not trying to make your life more difficult. Okay. But if you could do us the common courtesy of showing up on time, maybe even a few minutes early to complete the handoff, make sure if you have any issues, if you have login issues, anything like that, just notify us.

So verify that you have the phone, that the phone is charged, that it's making outbound calls, verify the tablet is functional. I don't know what Yubikey is. I assume you do. It's for what? This dual authentication thing. Make sure you know how to use that because I don't verify the room is clean.

Make sure that on the system operator chat you're sending out a note every day. Your new operator is blank until blank. Okay. That is a very, very, very helpful thing for us to know so that when there is a call because you are going to be changing in the middle of our shifts, you don't run Wednesday to Wednesday.

You're on all different days of the week. And so it would be very helpful for us to be able to keep a mental note of who is who for any ongoing shutdown. Active service items. Put a Note In the chat there's been an operator change and request a status update. I would say that that is more to the teams that we have in terms of did a crew get to the communications issue?

This is still up and running or make a call to the operator team on staff. Maybe that's an easier way to do this, is to make sure that, you know, we had these open items and if you couldn't get the information on how it was being handled from the handoff operator call the system operator and just make sure you have a good functional understanding and then you can post that status update.

We have weather coming in the on call meteorologist is helping me navigate when to shut things down. We have a we have a comms issue at Greenville. We verified that the turbine is still spinning. We will dispatch a crew at 10 am when a crew frees up. Whatever that status update is. We don't run so many turbines right now that this is going to be a very, very difficult thing.

And so verbal handoff, project turbine, but abnormal condition if there's a grid condition, anyone who's involved in terms of people, personnel, whether it's a gold wind issue one energy issue, a customer issue and any weather related shutdowns, those are the things we're looking for. Oops, I really should’ve change screen on that. Do your storytelling if you can just copy and paste that on over. Thank you.

Wall Layout – 14:08

Okay, the wall layout. So the wall layout, if you flip to the wall layout, there is a wind map, weather forecast, storm watch task world, Gmail drop box. That's going to be wall one. So when you walk into the room, the the wall that you see is going to be wind weather. I mean, you want to talk about this here.

So basically that first wall is just the working area. It has Task world, gmail, dropbox and anything else you might use frequently. And to the left are the wind projects, SCADA projects, things we looked at yesterday, and the right will be things like the PJM you can monitor the location marginal prices. The office cameras are on that wall. And any substation stuff will be on that third wall. So if you start loading things differently in here, it's not going to be standard.

If you all are kind of on the same page, you want a different layout, Very, very open to that. But it will confuse Jeremy and the team to no end. If you start changing and somebody else starts using this as a protocol. So just let us know if things are not working properly and we can make some adjustments and kind of roll this out again and start doing some revisions.

I would expect this is a document in progress.

Weather Shutdowns – 15:42

So weather shutdowns, you are going to be getting some very serious weather training very, very soon. I think this afternoon, even with Jessica Grosso, who is…her background is in atmospheric science and engineering. She is an incredible resource for radar monitoring. She runs our, she runs our ppt group project development technology, those sorts of things.

But she happens to have coincidentally an amazing background in meteorology. And so she does a lot of in-house training for our teams. You cannot get a better training. You can go to your local weather person and not get a better training than what you are about to get on it. She's incredible. And so I cannot say enough about how much knowledge some of the on call met team has in terms of storm fronts.

You will not need the level of knowledge that she has. Okay, so most of it is look at the radar. If it looks like it's not going to be a good time for the facilities, we're going to start bringing things down, changing the way we're operating them, using some of our protocols that are in place. So most of this, I will defer to her on you will get some very in-depth training, but these are the protocols that we're going to be following for wind and storm shutdowns, ice shutdown, storm lightning conditions and other consultation requirements that we're going to require.

And on the second page of this, we have our typical protocols that the system operators follow for warnings and watches. But if we're going to go through this list, I would say if we are seeing a wind or storm event, tornadoes, derechos, straight line winds of any kind, you are going to want to make sure that you understand when and why we shutdown the why.

So the highest the peak storm events cause a exponential amount of damage to the structure. It's those top wind events, storm events. They do more damage to those structures than anything else. They're fatigue-governed, but they're high fatigue events. So if you start seeing 80 mile an hour winds and it comes in in a front and it comes in within like 30 seconds.

Right. And you're not prepared for it, that structure spinning, you can overspin. You can do a lot of damage to the structure, not to mention the electronics in the structure. Right. And so we're very conservative in shutting down the turbine is expected to shut down itself. But it does that in a matter of it will grab ten second interval data.

Okay. So when it identifies, okay, we're gusting we're gusting really high now, we're gusting to a shutdown level, it takes some time for that system to shutdown. YAWs. It does a whole bunch of stuff. We do not want to do that. If a front's rolling in quickly. Okay. So if we miss a front that's rolling in and it's got to you know, and it looks like it could be like tornado level winds, serious, serious, strorm front, we usually shut down 5 to 10 minutes before that front comes through.

And frankly, if we're going to be shutting down all night because there's a little pop up storms, what we might say is we're going to shut this down for a while. Let's just turn those turbines off. If we have a grid issue, I just want you to monitor the grid issues. But let's just turn these turbines off for a hot minute and we'll turn them back on in a few hours because this is going to be really this is going to be touch and go for a long time.

And that's what we tend to do if we're going to be up all night watching fronts come through and we're going to have to shut it down, shut a project down every 45 minutes, we're not going to get any sleep. It's not going to be worth it for you guys. You might feel a little bit differently, but you are going to if a wind is from shutdown criteria is met, check.

You'll be working with Jessica. But you will also be referring back to this protocol, this chart protocol. If it's met, you're going to shut down the turbines at the site. Okay. And you're going to add the time to the log. You're going to post a site screen and shutdown time to the system operator chat. You're going to be doing your normal one hour checks.

You'll come back and check it in an hour, see how things are going, and then you're going to restart when the condition is clear. So if an ice shutdown criteria is met, so icing and I think we're going to talk a little bit about icing, how to watch the power curve, things to look for. Usually what's happening is if you pull up SCADA and hopefully Lukas showed you where the power curve is located in SCADA.

But if you start to see your power curve dip, you're going to know that there's probably icing involved. So the blades are being loaded and the power curve isn't as efficient as it normally would be. So your power is dipping you know, is dipping in comparison to what the standard should be. You're going to know that you very likely have some ice on those blades.

So if icing criteria is met, the turbines generally try to shut themselves down. If they have a certain software, not all the turbines have that software. And so some of the turbines, you have to monitor the power curve because they'll just keep running forever. And the last thing any of us want is to get a call from a customer who says, You’re pitching ice into my facility, we put turbines very, very close to parking lots and places and they're safely sited.

If something were to fall, if they were to catastrophically fail, they're sited safely for things like that. They are not necessarily cited. So that no ice shed ever affects the parking lot. Right. And so we have a couple of facilities and I have made this mistake in my career. I made this mistake at Greenville. It was a large icing event and it was not icing here.

And I did not check the cameras. And I looked at the power curve and I thought, it's icing a little. It's going to be fine. Well, they had my direct line and I got my butt chewed. And so it's not comfortable, especially when they're worried about people's safety. Ice melts. You won't necessarily know what happened. It'll leave divots in the ground, it'll do things.

But it was a really, really, really strong icing event that I missed. And so icing is something that's going to require a lot of training, especially before we come into ice season. So it used to be icing only occurred about one strong icing event a year. That's changing. Things are changing. And so there's a lot of there's a lot of fluctuation with what we're expecting from you in different seasons.

This is a seasonal item. So when a turbine qualifies as an icing event, shut it down, add to the time log, basically post it to the system operator chat, Follow the ice restart procedure, which is shown at the back here. I mean, all these things are laid out pretty clearly for you. If you have any questions on the checklist, let us know.

So the other thing this is, again, probably more related to the daytime crew or the weekend crews. If a crew is on site when you're climbing, you can't keep your phone out of your little climbing pouch. You can't be looking at it constantly. When I'm in Tower, I very, very, very rarely look at my phone. And so what I will do is if I get a call, I will answer it.

And so from time to time, the crews on onsite, the operational teams who are servicing turbines or a construction crew may say, I need you to watch lightning alerts, storm alerts for me because we're going to we're going to go up a turbine and it looks like a front might be running, rolling through, but we're going to try.

And so they might have you watch for storm fronts during the day and you might have a point person to notify if there are fronts rolling through or on-call met does that for us. Now, I think you would be a great first line of defense for that in the future. And it is very, very helpful to specifically the daytime crew when we're working on turbine related outages if weather consult criteria is met.

So there are a whole bunch of things that you can roll through. I in your little booklet of people, we will have the on-call met team identified. We have three on call members of the team, Jessica Grasso, Bobbi Covington and Kurt Lutz, and all of them can help you identify what the risk criteria is for the projects. They're all very adept at that.

They've been working on it for. I think even Bobbi's been on the team for over a year now. So all of those things are very helpful. Just keep them in mind. Jessica will also be going through this weather shutdown protocol for you. Severe storms, tornadoes, lightning, high winds, What to do when gusting is a problem, when gusting is not a problem, What a warning versus a watch means.

She'll go through all of this in pretty good detail and you'll have a couple of hours with her to go through this process. So any questions you have related to weather ask then think about it and ask then. she's going to throw a ton of information out to you. But if you can ask the questions there, I think it'd be very helpful.

If you have questions after the fact, let me know and we will get all of your questions and concerns addressed. The ICE restart procedure is listed down below. If you happen to have a turbine that's iced

and you just want to get it back up and running so you don't have to monitor it any more. I understand that feeling.

We will try to help you get them restarted. When you do this for the first time, it's usually daylight hours. You want daylight hours so you can watch the ice. You also whirlpool, for example. Whirlpool w one, it's blades. If it's in the if it's in its prominent wind direction, it's going to be if it were to be throwing ice, it would be throwing ice toward the road.

Right. So Whirlpool shift changes are at 630. I don't expect you to have all this knowledge. We've been working with these projects for a long time. We have an understanding of when when it's a good time or when it's not a good time. Please, please, please consult with the system operators for a period of time. If you're going to start doing some of these protocols.

As we get more comfortable with things, we might just start saying, Hey, you know the procedure, just do what we did last time, right? But run everything through the sys ops group for a little while. It's just the way the cookies going to crumble.

Turbine Fault Packages – 26:31

Turbine fault packages. Now, the training I was about to give was going to be related to the turbine fault packages and the grid fault packages.

This is what these two really, really care about. They want to know what you're going to be assembling for them and what your actions will be. And so we have projects that are under OE service, Greenville, Val from Cooper and Haviland, and we have projects that are not under Goldwind service. The remaining projects. And so for the projects that are under OE's service, we need to identify the fault.

We need to fully troubleshoot that within our own team. So if when there is a suspected turbine fault, the turbine or turbines will turn red in color in SCADA and will show a faulted condition. So Lukas should have shown you SCADA a little bit. The turbines are all a certain color green means go, white means device brake, purple means alarm.

Hydraulic oil might be low or the lube might be low, or something's not acting normally. There are all different things. Red means fault. Okay, so if the turbine is red or is showing device break, that generally means there's an issue. So those are the two primary colors I am expecting you to see. So the expectation is when you identify an abnormal criteria, you are going to be in assembling this package.

Okay. So first thing you're going to note is you're going to log a fault time in the time log and you're going to say at 8:03 harpster is showing a fault, or I guess I should use one of the ones that is under one energy service. So you would say Greenville is showing a red fault and it's related to IGBT grid side seven, Right.

Whatever it might be. And so you are then going to prepare the fault package, which is going to be a screenshot of SCADA. And again, the fault package is really just using the system operator chat you're going to go through and you're going to take a screenshot of the SCADA showing the turbine is faulted. Grab the fault code from SCADA.

So you're going to say it is fault code 437, which is this right? And then you're going to take a current voltage screenshot from the affected turbine or the other turbines if not available. And again, we can go

through the details of what we're doing with that and any other events on that project turbine in the last seven days, which I think is overkill because there could be a lot of them.

But if you see anything that is the same code and it's been reset six or seven times, you'll know that there's probably a root cause causing this. So there's going to be a lot of handoff between you and others. If for example, IGBT X faulted and we reset it and kept running it and it faulted again, you're probably going to know that resetting, it's not going to solve the issue.

Just like if you were to do it on your car, clear the faults, if the fault pops back up, you might have a real problem. Right? So you're going to email the fault package to system operator at one Energy LLC dot com and then contact the system operator again. You can email the fault package. I would also use the chat if that if you think that's a better response time, contact the system operator and receive advice on how to proceed.

You're gunna log whatever you guys decide to do as a team and then when the turbine is back in service, complete the event log and the time log, right? So very likely for most of the turbine faults, if it can't be remotely reset, it will be a service team that goes out to it. And so that's the part of the handoff process.

We had this turbine, It's having this issue talked to the team. They're not going to be able to service it until X day. We need to order these parts. I want you to know we're dispatching a team during your shift, right? Please follow up with them. So if you're working with the system operator, team Erica and Justin may say, All right, I think it's worth trying to do a remote reset on this.

Okay. In my humble opinion, let's try resetting this and see if it clears. They need to make that decision because some of those parts are $20,000 parts. So if they screw it up, they can say, my bad, right? You don't need to say that. So and occasionally, especially if turbines are showing device break, it generally means there's a communication issue.

Treat them all if it's in device break or if it's in fault, treat them relatively the same because you'll start to identify when one is communication, when one is a fault. It will start to come to you naturally. So for projects that are under a Goldwind Service, it changes a little bit because if you identify a fault, Goldwind should also be identifying these faults.

Godwin's Remote Operations Center should be doing the same thing that you're doing. But this is they're usually they can be extremely slow if they've got an operator on staff. Sometimes it takes them 4 hours to identify a fault, and so they're not quick to our team and we need to start creating a little bit of a refined system so that when we get a fault, we're addressing it in real time.

So when there's a suspected turbine fault again, should turn red and color log the fault time. If Goldwind has not sent an email or a phone call, please ask for a status update on that project. I would send an email and I would call Just try to get a status update so you can post that if Goldwind agrees that should be handled by their service team, send an email notifying both system operators and Goldwyn that the fault has been identified and their team will respond.

If Goldwyn says it is an open issue, contact the system operator and prepare Fault package. Right. Start, Start the preparation. Oftentimes they say that it is our fault, which is frankly most of the time bullshit. But sometimes legitimate. Sometimes it's a communications issue. But a lot of times they just don't want to send a team to do it and they don't want to take the downtime.

So grid faults are very similar process. So the difference between a grid fault and a turbine fault is that all three turbines, if it's a grid fault, usually show as device break, they will pop up as white and they will show in device. Is it? Yes. Sorry, orange. I've been saying the wrong color this entire time. Brittany edit. so this is going to be a hand off to the system operator team is essentially what you are preparing so or they might ask you to close the breaker they might give you direction to act.

Right. So for all projects, when there is a suspected grid fault, a project will show all turbines in that project in device break, whether that is yellow or white. Thank you, Rico. So you will compile a hand-off package with the following materials, one of which is you're obviously going to log the fault time. Everything you do will have a log associated to it.

I'm sorry. I think it's just the way that it's currently going to be handled. Nobody likes logging time. You're going to prepare the fault package, which is going to be a screenshot of SCADA showing the turbines in device break. Screenshot of the SEL 351 relays. Looks like there's missing stuff here. Do you know that? Okay, so you're going to take a screenshot of the SEL 351 Relays Control panel.

I'll show you what that looks like, but we will definitely get this updated. So that's going to basically show voltage. It's going to show voltage, it's going to show what it tripped on. It's going to be like a dashboard. And so one thing that you're going to look at is you're going to look and see whether that project still shows good voltage on all three phases on the grid side.

Okay. And what the amperage looks like at the time of events. So you will take that screenshot. I would go ahead and send that and then I would start pulling the event file from the register for the relay, the 351 relay. I will show you how to log in, how to pull info. That will be a later session, but you will take some of that information.

You will compile it in the fault package. So what we're really looking for is in the event file, how much amperage passed through the system, how big of an event was this? Was this I mean, was this five amps to ground or was this 5000 amps to ground? Right. And so we're going to be doing a little bit of an analysis and we've seen both.

So it is not to say that you will not see a major outage about I mean, every once in a while, I'm not going to put a timeline on it because I get we got some real superstitious we have some real superstitious people here. I'm on call for the next week. Calm down, everybody… I just want you to know it didn't happen to me, so I don't care. But so Justin is superstitious note that in your diary, but we're going to be looking to see a is there still voltage available or is this a grid issue?

Or if if there was an event that passed through, are we going to damage something by turning stuff back on? And you do the best you can remotely, but sometimes it requires somebody going out there. If there's a large amperage event that passes through the system. And so event analysis in some cases could take a Ph.D., which nobody in this room probably has the right credentials for.

To be perfectly honest, I've been doing this for a long time and I'm not great at it. Sometimes it just gets passed along to the next expert. And so we do have a couple of technical resources available to us. So Brian Curkendall, again, he's an electrical engineer. He's probably one of the best resources we have on staff to do it.

We can also take this external and send it to some of our other electrical resources if we want to know what type of event it was. But basically you want to open the event file and take a look and see what amperage was and we can show you how to do that when we log into a project. So, you will email that fault package to the system operator.

You're going to call that system operator. You're going to log all this stuff. And then when the project goes back into service, whenever that may be, whatever shift that may be, you're going to make sure it's noted as well. So the communication side of things, occasionally there are communications issues at the site related to media converters, firewall things, not failing over properly.

If you cannot connect to SCADA or the operations server, please try the PLC. If you cannot connect to the PLC, one of two issues has generally occurred, one of which is there's a grid fault and the battery backup failed. It's not functional either. It waited too long. We didn't catch it in time or the battery backup. We've had a few issues where the battery backup has failed very, very quickly within minutes.

And so if you can't flip things back to normal, there can also be an Internet outage and firewalls 4G doesn't fail over properly. We've tried to address all of those issues in the past and to my knowledge, we're in okay shape that way. But you will be given permission to open and close the project switch gear to do some of the opening and closing of stuff.

Again, everything's going to have to roll through the system operators for the foreseeable future as things get a little bit more comfortable. We'll talk about adding protocols for you and your team

Received Calls – 38:33

received calls. So we talked about your nice little handy dandy script. This is what you're going to do. You're going to log the call. If it's an emergency, you're going to do some additional requests.

If the ROC is calling, you're going to do some different stuff, other non-urgent calls, take some notes and pass them along. If someone is trying to sell you insurance. That's not us. So you're welcome to take the note. You're also welcome just to mark it a spam spam call at this time on the CRO phone. It doesn't really matter, but if all calls make sure you get their name.

That's the one thing we do want is name, organization and return phone call number for. If they will not give that to you. It's kind of odd, especially if it's customer related. We want to know who the point of contact is, who's seeing it through. So whichever, especially if it's a customer issue, because if they're having a major facility issue and they suspect that it is us, we've gotten calls as weird as active shooter bomb threat calls for the turbines.

They're very tall structures. You get a call like that. I need you guys to turn it around immediately and call us. And so there's some weird stuff that can happen. And we don't often get those phone calls. It's not like regularly we're getting weird threatening phone calls, but it happens. We're not outside of the norm for that. So get their name, get the organization, phone number, what they're calling for, and if it's related to a project or a turbine.

So sometimes we get the calls about FAA lights being down or sometimes it's a noise complaint from a citizen. Those sorts of things pass along. So if it's an emergency, it needs to be serviced right this second. It's plant related or it is like catastrophic right. So plant is down and they want us to look into it right then and there where they think we caused it, something related to that.

So for perspective, if Ball sits down for 4 hours, you can combine all of our annual salaries in this room and it will probably not cover that outage. And so it is a significant amount of resources that they burn on a minute by minute basis. And so any sort of plant outage needs to be prioritized because the liability and risks associated with that is extreme.

And so anything related to customer outage, give us a call. That's 2 a.m. if it's 4 a.m., if it's the middle of the workday, I do not care. Give us a call. We'll need to respond to that a lot faster than we respond to something else. If it is emergency medical emergency, sometimes that's somebody breaking into the turbine and they fell and, you know, they are having major medical issues.

We need to be identified of emergencies very, very quickly as well. So emergency immediately contact the system operator team by phone, shutting down fires, things like that. All these taboo things that we really hope don't happen. But we do need to discuss them directly, directly. They need to be discussed so that you have some examples of what they might look like.

Yeah, if Goldwind is calling us, notifying us of an outage that they're taking care of, just note in the log. If they're notifying us of our responsibility, it needs to be handed off. And again, non-urgent things, not that big of a deal.

Hourly Checks – 42:08

So the hourly checks, we are trying to get this team to where you are doing an hourly check.

Initially these checks might take you a full hour. I would expect these checks take five or 10 minutes for basically the rest of your time. I don't expect if things are in normal condition, they're not going to take very long. It's more when you find something abnormal that it's going to take a large consumption of your time. So if you're not meeting the hourly checks initially, not the end of the world, ideally you're starting to meet the hourly checks, you know, later on in the process.

But if you're going to check weather and radar first, incoming storms, weather events, anything that's on the radar that looks like it's going to hit quickly or ferociously. So note that. PJM prices for anything above $100 per megawatt hour, PJM and LMP are the same thing. So am I wrong about that? So PJM and the marginal pricing like LMP pricing is on the PJM?

Correct. But is there like is he also referring to like Henry Hub pricing for that? Does he want us to log anything with relation to that or is he good? Okay, ask about that. We'll get you some information on that. But PJM pricing, so if you don't know what the PJM screen looks like, let me know. I'll pointed out to you, the dollars and cents are on the same screen.

Anything over $100 just note, and I'm not sure where he wants that noted. Is there a log for that? Okay, cool. Check the alerts at email for any project related alerts. Sometimes you get some weird odds and ends. The web 600 are active at some projects they'll kick out like a switch gear open or like a switch is open breaker open, things like that.

But we get some project alerts from Goldwind from the turbines directly if faults start kicking out, check those first and then check the following turbines for SCADA login, faults and device break alerts, etc. These are the projects Cooper Farms, Haviland, Whirlpool Findlay, ball one Ball two Greenville Valfilm, Marion Harpster, Ottawa, Lafarge and Martin Marietta, which is expected to be online in December.

So check security cameras for abnormal conditions. We can do that. We can show you that there's only security cameras here at the office that I think we're going to be checking initially confirm all computers in the control room are charged, are fully functional. Email accounts, chats, active, logged in, confirm, no pending post-its. I don't exactly know what the post-it system is, but I assume that you've kicked that over to them.

Yeah. Yes. Wonderful. And confirm the screen layout is correct and then log it in the hourly check. So there is an hourly check form that you will use and that form will have all of these things. All you need to go through is check. Cooper Farms is up and operational. Our Cooper Farms is showing a fault. We knew about this yesterday.

It is a continuation of that fault. We're not going to be able service until parts come in, whatever. Right. Some of them are going to be quick. Some of them are going to be long. But these are the things we currently want you to check. I would expect that the I would like to get some feedback on how long it takes you to do this after you've become familiar with the system logins, all of that good stuff.

I would be very curious as to how long it takes to check something like Cooper, for example, Cooper's Probably the hardest project to log into by far the hardest project to log in to. So if it's taking you an hour to log into Cooper, I want to know about it so that I can change how we do this.