UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

* * * * * * * * * * * * * * * * * * *
Investigation of: *
*
ENBRIDGE OIL SPILL *
MARSHALL, MICHIGAN * Docket No.: DCA-10-MP-007
*
*
* * * * * * * * * * * * * * * * * * *

Interview of: JIM KNUDSON

Crowne Plaza Hotel
Edmonton, Canada

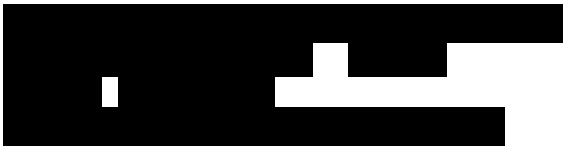
Thursday,
December 16, 2010

The above-captioned matter convened, pursuant to notice.

BEFORE: MATTHEW NICHOLSON
Investigator-in-Charge

APPEARANCES:

MATTHEW NICHOLSON, Investigator-in-Charge
National Transportation Safety Board
Office of Railroad, Pipeline, and
Hazardous Materials Investigations



RAVINDRA CHHATRE, Accident Investigator
National Transportation Safety Board
Office of Railroad, Pipeline, and
Hazardous Materials Investigations

JAY JOHNSON, Senior Compliance Specialist
E nc.

B neer

K isor of Accident Investigation

RICK BARLOW, Pipeline Modeling Specialist
Information Technology Department
E

I N D E X

I N T E R V I E W

MR. NICHOLSON: Good afternoon. Today is Thursday, December 16, 2010. My name is Matthew Nicholson and I'm an Investigator with the National Transportation Safety Board in Washington, D.C. We are currently in Edmonton, Canada at the Crown Plaza Hotel. We're meeting in regards to the pipeline spill in Marshall, Michigan that occurred on July 25th, 2010. This is Case No. DCA-10-MP-007.

Before we begin I'd like to please have you, Jim, please state your name and whether you -- whether we have permission to record this interview.

MR. KNUDSON: Jim Knudson and, yes, you do have permission to record.

MR. NICHOLSON: And also if you'd like you realize you're permitted to have one other person present during the interview.

MR. KNUDSON: Yes and I've chosen to take Rick Barlow who is an engineering specialist with Pipeline Modeling.

MR. NICHOLSON: Okay, terrific. And at this point I guess we'll start with me and we'll go around the room to my left. Each person state your name, your organization you represent, your title, spelling of your name, business e-mail or contact phone number. My name is Matthew Nicholson, M-a-t-t-h-e-w, N-i-c-h-o-l-s-o-n. I'm an Investigator with the NTSB. My e-mail is [redacted]

MR. CHHATRE: My name is Ravi Chhatre. That would be R-a-v-i-n-d-r-a. Last name C-h-h-a-t-r-e. I'm Accident Investigator at National Transportation Safety Board. My e-mail address is [redacted] and I'm here to assist IIC Matt Nicholson.

MR. PIERZINA: And I'm Brian Pierzina with -- an engineer with the PHMSA [redacted]. That's B-r-i-a-n, P-i-e-r-z-i-n-a and my e-mail is [redacted]

MR. BARLOW: Hello. Yeah, my name is Rick Barlow, that's B-a-r-l-o-w and I'm here at the invitation of Jim Knudson and my title is Pipeline Modeling Specialist and I'm with the same group that Jim's with which is the Pipeline Modeling team of the Operations Group of -- in the Information Technology Department at Enbridge. And my phone number is [redacted] and my e-mail address is [redacted].

MR. KNUDSON: Yes, I'm Jim Knudson. That's K-n-u-d-s-o-n. I'm an MBS specialist with Pipeline Modeling here in Edmonton with Enbridge and my phone number is [redacted] and e-mail is [redacted]

MR. JOHNSON: And I'm Jay Johnson, Senior Compliance Specialist in the Pipeline Safety Compliance Department for Enbridge. I can be contacted at [redacted] and it's J-a-y.J-o-h-n-s-o-n.

MS. BUTLER: I'm Karen Butler. I'm at PHMSA [redacted]

[redacted] Accident Investigation Supervisor and my e-mail address is [redacted]

INTERVIEW OF JIM KNUDSON

BY MR. NICHOLSON:

Q. Okay. All right. Jim, really what we're going to be doing today is going over your previous transcripts a little bit. I'm looking for clarifications probably in some areas that I need further information on for the report so I think you've got a copy of your transcript.

A. Yes, I do.

Q. Let point at it and then we might talk procedures, as well. Now, I want to revisit, to begin with, maybe page -- it's my page 11 and, hopefully, it's yours, too. But basically on page 11 you kind of discuss -- what you had said is you overheard the Line 6 operator say it would be a difficult startup due to column separation on the line. I think that's the morning of the 26th.

A. Yes.

Q. Okay. Can you just elaborate on that a little bit? What did you overhear and how many col seps did they talk about? How do you think the controller knew about this?

A. My recollection is that the operator walked down to the Sarnia console which is about ten feet away from where the MBS analyst desk is.

Q. Okay.

A. And I overhead him state that he would be starting up at approximately 1:00 and he expected it to be a fairly rough startup, something along those lines, given that there was column separations that existed downstream of Stockbridge.

Q. Downstream of Stockbridge --

A. Right.

Q. -- that's all he mentioned? Not anything at Marshall, then?

A. No.

Q. Okay. And so how would he have known -- how was he aware of those col seps?

A. He would have been aware of them by looking at his display and realizing that the pressures would have indicated that he was below vapor pressure at certain points on his line.

Q. Okay. And then I think you also mentioned that you pulled up Line 6 before 1:00 a.m. to see if there were the multiple column separations.

A. Yes.

Q. And that's based on what you had overheard.

A. Yes.

Q. Okay. And I'm just curious, then, what screen -- what did you look at to confirm that on your screen?

A. That would have been the flow display that Ted showed you this morning.

Q. The --

A. Would have showed you the elevation and the head and the flow on the line.

Q. Okay. Okay. Did you look at the liquid fraction screen, as well?

A. No.

Q. And what did -- did you see anything at Marshall, then, or where did you identify the col seps at that point?

A. Actually, I wasn't identifying any column seps at that point. I just simply brought it up just to reference what the operator was saying and then I didn't do any type of -- I didn't investigate anything further. I just simply looked at the display just to verify for myself that -- what he meant -- what he was talking about.

Q. But you didn't see anything.

A. No, I never went looking for anything.

Q. So you just brought up the display.

A. I brought up the display to see what he was -- to see what he was indicating. Now, I was aware that this line had -- this section of the line had been shut down since 1500.

Q. Okay.

A. So I was aware of that so I would have had no reason to look at anything further. I wasn't responding to an alarm or a request from the shift lead or from the operator to investigate anything.

Q. Right. Yeah, you weren't officially notified at --

A. No.

Q. -- that point. You were just curious. Is that all? You were curious just to see what he was --

A. Yes.

Q. On page 14 of my transcript basically discusses -- what you talk about here is and I'll quote it. It says "So I determined that we needed approximately 310 pounds of pressure at Mendon in order to be able increase pressure by zero at Marshall." I'm just curious how you arrived at those calculations. What did you use?

A. I used the standard line loss calculator. Having been an operator in the control center we used a specific tool that was shared amongst all the operators for just putting in simple values to calculate --

Q. Is this an Excel spreadsheet or is it something --

A. No, it's a simple little, little -- an SWM I think it's called, tool.

Q. Okay.

A. And it's just something that -- it's not something that has been approved by an engineering department or anything. It's just something we use as a quick, easy method to perform a calculation in either a flowing line or for a static gradient.

Q. And you say it's something we use. Only MBS analysts or --

A. No, this isn't a tool that the MBS analysts use.

Q. Oh.

A. Usually we rely on whatever the calculation is from, like, what we returned for pressures of that from the calculated values in the model. But in this case what -- the line had already been shut down and what -- all I wanted to do was determine what did I need or what did they need at Mendon in order for the column to be intact at Marshall?

Q. And I'm not sure I caught this. Is that a typical -- is that something you would typically do, then?

A. Not something that I would have typically done as an MBS analyst --

Q. Okay.

A. -- but it's something that I did out of interest for myself to know what do we actually need. What -- if I saw the pressure at Mendon rise above 320 then I would expect that Marshall's column would be back together.

Q. Okay.

A. So it was kind of -- I did it in the form of preparing myself for what my expectations were for the column to be put back together.

Q. Were you asked to do that or --

A. No. But --

Q. Okay.

A. -- I was asked to monitor the startup.

Q. Okay.

A. Right. And this is what I do and in the context of monitoring the startup I wanted to verify with myself what pressure I would expect at Mendon in order to have Marshall column fully intact.

Q. Okay. And so that calculation is basically just taking head and dynamic losses. Is that --

A. Right.

Q. -- all it really looks at?

A. Yeah. It's -- it's just something --

Q. Does it get into viscosities or densities --

A. Yes.

Q. -- what --

A. Yeah.

Q. It does. Okay.

A. We have a list of -- and it's a very generic type of calculator that's used.

Q. Okay.

A. I don't even think it really has even an official name. It's just something that you use as a reference tool where you put in what the flow is, you put in what the viscosity of the oil is, based on what you see and the density of it, and you put in the distance for the pipeline and you put in the elevation change.

Q. And you were calculating -- I'm sorry -- for LaPorte to Marshall?

A. I was calculating from Mendon to Marshall based on --

Q. Oh, from Mendon to Marshall.

A. -- based -- right -- based --

Q. Mendon discharge to Marshall suction.

A. Right.

Q. Okay.

A. Based on using -- I think I used 1,900 for the flow which was the flow coming out of Griffith and I put in the fluids that were in between Mendon and Marshall and what viscosities and densities would have been associated with those.

Q. Okay.

A. This is a tool, like I said. I used it as an operator and I was quite comfortable using it.

Q. Okay.

A. It wasn't something that was foreign to me.

Q. Right. And I think I've heard another shift lead talk about it, too. I was aware of it. The -- wouldn't they have had the option, though, if they couldn't develop 310 could they not have run back on the pump curve a little bit lower flow rates and just filled it in a little bit slower? Cut back on the pressure, you have lower flow rates, lower DP. Was that an option just to run at a reduced --

Q. I --

A. -- flow and take a little longer to fill it in?

A. Well, I haven't been an operator for over three years.

Q. Okay.

A. And I probably haven't operated that line for over five years when I was an operator so I really can't make a comment --

Q. Okay.

A. -- on what they should have done as far as operating --

Q. Okay.

A. -- is concerned.

Q. So you just ran the one scenario, 1,900 cubic feet (indiscernible) --

A. Yeah, I simply -- I put this in from when the line was shut down in between when they shut down and tried to start it up again to simply confirm to myself what I expected for pressure at Mendon in order for Marshall's column to be fully intact.

Q. Okay. And again we were talking about Mendon discharge --

A. We were talking --

Q. -- pressure.

A. -- about Mendon discharge, the gradient from Mendon discharge down to Marshall suction.

Q. And that was a -- that's a 30-mile run, roughly, right?

A. I think it's 31 miles.

Q. Okay. And the elevation change is what --

A. I'm not sure.

Q. -- do you remember?

A. I wouldn't know off the --

Q. Okay.

A. -- top of my head.
Q. Okay. And can you -- I want to back up just a little bit. When you did the -- where were we in our timeline when you did those calcs?
A. This probably would have been somewhere around 3:00 in the morning. It would have been --
Q. Oh, this is --
A. -- after the initial -- it would been after the initial startup.
Q. That's right. So we had already started and failed --
A. Right.
Q. -- when they came to you. Then at that point when they had done the startup and failed and you did that calc, Darin was also doing -- were you working with Darin or Aaron? Which shift lead were you --
A. I wasn't working specifically with them and doing this. It's we -- I think we both did it separately.
Q. Oh, okay.
A. And we both came to within ten pounds of one another.
Q. Okay.
A. And that's -- that would be kind of a common thing, like, if two people did a calculation you would compare to make sure, you know, that it was close.
Q. Yeah. Yeah. Just to check and that was Darin that was doing that.

A. That would have been Aaron.
Q. Oh, I'm sorry. Aaron.
A. That did it.
Q. So what was Darin -- what was his involvement at that time?
A. At that time I think Darin was involved with the operator.
Q. Okay. And then going a little further back then when they first started up were you watching the first startup from your console?
A. I watched from the moment that Tim Chubb phoned and advised me of an MBS alarm.
Q. Which was how far into it? Would he have been past his ten-minute?
A. I'm not sure because --
Q. Okay.
A. -- I would have been engaged after the startup had occurred so I'm not sure when he would have taken a marker for when -- okay, this is the startup starting at this time. I would assume it was somewhere between 1:00 and probably 1:15, somewhere in that timeframe.
(Pause.)
BY MR. PIERZINA:
Q. Just to clarify, Jim, that would have been a phone call that you got from the operator?

A. Yes, would have been a phone call.

MR. PIERZINA: Okay.

BY MR. NICHOLSON:

Q. Okay. So still on my page 14 --

A. Okay.

Q. -- and I'm looking at lines 22 through 27 and in there there's a comment, you say, "There were no active alarms. The static profile that the model was showing for Line 6B indicated five sections where column separation existed and the summary alarms or the summary volumes were at zero." And I'm not sure I understand what that means. What are the summary alarms and the summary volumes?

A. Okay. I haven't found where you're at on this -- you said page 14?

Q. Yeah, and I think we found out earlier my pages, because I print double, here's the conversation that you want, right here.

A. Okay.

Q. It's highlighted.

A. Okay. Yeah, so now I know what you're talking about.

Q. Okay. Can you just elaborate because I don't know what that means.

A. Well, when we receive alarms, right, they come in and we receive them as either a five-minute alarm, a twenty-minute alarm or a two-hour alarm.

Q. Right.

A. Now, those are based on volume over time.

Q. Uh-huh.

A. So once a line shuts down if we're not continuing to lose then it's going to clear the alarms. That's the time will move but the volume doesn't move. So the volume over a period of time will have been reduced to the point that it was brought below the threshold. Now, I'm not sure what exactly the thresholds were at that particular time but if the alarms cleared they would have dropped below the threshold for the five-minute, the 20-minute and the two-hour alarm.

Q. Okay.

A. Or actually, Rick, do you want to --

Q. Yeah, if you could -- because this gets into --

A. Rick could clarify this a little bit better.

Q. -- why maybe on the 25th, as well, the alarm cleared, right?

MR. BARLOW: Okay. I'm sorry. You were going ask --

MR. NICHOLSON: I'm going to -- I'll say it again.

MR. BARLOW: Sure.

MR. NICHOLSON: And I was looking for clarification on Jim's statement here where -- and you can read it but I think maybe what Jim's trying to describe is why an MBS alarm clears --

MR. BARLOW: Um-hum.

MR. NICHOLSON: -- after the line is shut down with a leak or column separation --

MR. BARLOW: Column separation, okay. Yeah, the alarms look at whatever the calculated volume imbalance is on the line and if the calculations, the internal calculations are such that it no longer sees or that imbalance has disappeared they look back in time for various periods and for different sizes of alarms. So --

MR. NICHOLSON: So five- to 20- --

MR. BARLOW: -- five- to 20- and the two-hour. And if the hydraulic calculations within the model that's looking at the volume imbalances, if those internal calculations show the calculated volume is no longer -- there's no discrepancy between the calculated imbalance it will slowly clear over time more quickly over each window as it closes. Different calculating periods within each window, the five-minute window looks -- those calculations every minute looks back five minutes. The 20-minute window looks back ten minutes and does calculations, I think, every five minutes and the two-hour looks back, also, two hours and does calculations -- I think it's every 15 minutes. I could check on that. So if whatever the diagnostic flows which are these discontinuities between --

MR. NICHOLSON: Okay.

MR. BARLOW: -- what it thinks should be there and what is measured to be there, over time, if those go to zero then these imbalances will eventually go to zero and the alarms will clear once they go beyond the threshold for each individual window.

MR. NICHOLSON: Yeah, you're really -- you're saying there's really no differential between the calculated and the actual.

MR. BARLOW: That -- yeah, at that point, yes.

BY MR. NICHOLSON:

Q. But that part still confuses me because you were at zero pressure at Marshall, right? I mean, presumably you had pressure downstream at Stockbridge, still?

A. Yes.

Q. So you would -- you know, you almost have reverse flow in the model at that point.

A. But the pressure that would have been downstream at Stockbridge would have been static because there was never any flow regime that was passed -- got past Marshall.

Q. Okay.

A. We would have had to have integrated the column at Marshall in order to have any type of a pressure increase at Stockbridge or to have any flow in that section.

Q. Okay.

A. Because the column separations that were existing from when they shut down in the morning -- early in the morning to do the Stockbridge delivery --

Q. Right.

A. -- those columns would have existed on that shutdown on the section in Stockbridge to Sarnia. Once Sarnia was opened up

again there was, I think -- I think there was four significant column separations in that section. So because we never caused flow past the point of Marshall because we never integrated the column --

Q. Okay.

A. -- none of the pressures would have risen downstream at Stockbridge or there wouldn't have been any flow that was associated with anything from the startup.

Q. So the only place you could calculate is between two col seps, one downstream at Marshall and one farther down at Stockbridge.

A. How do you mean --

Q. Where you still had solid --

A. Do you mean the calculation for volume imbalance?

Q. Yes. Yes.

A. Yes. It -- the volume imbalance would have been calculated from the meters.

Q. Right.

A. From Griffith to Marshall.

Q. Okay.

A. And there was very little residual flow on the Marshall meter whereas there was 1,900 cubes per hour on the Griffith flow meter.

Q. Yeah, okay coming into the (indiscernible) --

A. Right. So --

Q. Oh, where's the flow meter -- oh, the flow meter from Marshall, then, is coming into Marshall --

A. Yes.

Q. -- from the inlet side.

A. I believe it's on the suction side of the station.

Q. But that was at -- you had a column break there, too, as well, didn't you?

A. Yes.

Q. Okay.

A. This is why we never saw any flow to the -- get past the point of Marshall is we're, you know, looking at the flow meter we were putting 1,900 cubic meters in but no oil was arriving at Marshall due to the column separation is what -- would be all we thought. So what we were waiting for is the column to come together and for that flow to be viewed on the Marshall flow meter once the column became integrated.

Q. But you would have seen an actual flow though, right?

A. Yes, we would have seen an actual flow --

Q. Okay.

A. -- making it to Marshall.

Q. Okay. So that was appearing. So wouldn't that be your differential then? Actual is something calculated and --

A. We had residual flow on the Marshall flow meter. What I mean is, like, it's -- you can confirm that there is actual flow through the station is just it's a very small volume of flow --

Q. Okay.

A. -- that, you know, could be associated with sloshing once the valve is open at Stockbridge if there's anything open from there or even any pressure that existed on either side of Marshall, like, I'm talking maybe ten pounds, 15 pounds, something that was generating a little bit of a flow volume there. But there was nothing. No, we didn't view any type of an increase on the flow meter at Marshall --

Q. Okay.

A. -- that was associated with starting the pumps at Griffith and starting a pump upstream at Mendon.

Q. Okay. On the actual flow -- the --

A. Right.

Q. -- actual flow.

BY MR. PIERZINA:

Q. But is that a -- that meter at Marshall that has to be -- it probably has to be in a certain pressure range before it's actually functional. Am I right or no?

A. It would have to be above vapor pressure or else you'd be -- and it's a sonic flow meter so it would be looking at, you know, below vapor pressure and it wouldn't read accurate.

Q. Right. So if -- and this might help. If we've got a hole down the line so you can't build pressure it could be flowing by but it's not --

BY MR. NICHOLSON:

Q. But is that true on a ultrasonic flow meter, (indiscernible). You don't need a lot of pressure and you need liquid phase right but you don't need --

A. Well, with a gas/oil mixture and you're shooting a sonic signal through the gas/oil mixture you're not going to get, you know, a very accurate flow. I mean, it's calibrated to be in a liquid medium.

Q. So it was a two-phase oil upstream at Marshall.

A. Well, the pressures that were observed at Marshall would have indicated that we were well below vapor pressure which would have indicated a two-phase flow --

Q. Okay. Okay.

A. -- if there was any flow through that area.

Q. So you couldn't have trusted the actual --

A. No and that's kind of like the point I'm trying to make is that the Marshall flow meter was basically unreliable until we could have confirmed that the column upstream of Marshall would have been integrated.

Q. I see. Okay. Now, when you're referring to the static profile, what exactly are you talking -- are you talking about the elevation profile in that --

A. No, I'm referring --

Q. -- same conversation?

A. -- to the pressure that would have existed on a line without any external energy added to it.

Q. Okay. Just static pressure from the static states on the line.

A. Right. Static pressure.

Q. So you were -- did you -- had you talked to Darin before the phone call to Blaine?

A. I talked to him in relation to what MBS alarms existed and he asked me what I thought I was looking at and I expressed to him that it looks to me like you don't have enough pressure getting past Mendon to put your column back together.

Q. Had you ever seen that before, though, that you wouldn't have enough pressure?

A. I've seen it on larger lines, like, as far as my experience from an operator. But I wasn't using that in relation to what I was looking at. I simply just looked at what the calculation was that I did and realized that I needed 320 pounds in order for Marshall's pressure to be above 35 pounds which is within the Enbridge system is considered as being sufficiently above vapor pressure and for the column to be intact.

Now, when I went back and I looked at all of the information that I had in MBS I recognized that there was 280 pounds at Mendon and that was the highest pressure that we had achieved. I didn't look at the performance of the pump or anything such as that. I just simply looked at the discharge pressure at Mendon, did the calculation and figured out that we needed 320 in order to put this column back together and expressed

that and passed that information on to Darin.

Q. So you didn't even know if that pump -- if that station was capable of 320.

A. Well, I don't have any limits within MBS. I don't know what the maximum discharge pressures are or anything like that. All I know is whatever is being produced out of the station.

Q. And I guess I'm curious because -- are you a hydraulics -- do you have a hydraulics background or are you an expert on --

A. The hydraulics background that I have is from 20 years of pipeline operating and --

Q. Okay.

A. -- it comes from experience and it doesn't come from any official training or, you know, like I'm not an engineer and I'm --

Q. Okay.

A. -- not a graduate of technical college.

Q. Okay. Yeah, I'm just curious because I guess I'm trying to figure out -- we've talked to other people and it just seems like with the col sep, you know, you're thinking more elevation changes or I mean, leak is an explanation of col sep, right?

A. Yes.

Q. And so your first thought wasn't to go back and look at -- for triggers like pressure drops or review pressure histories.

A. Well, it's actually not my job to go back and look for triggers.
Q. Okay.
A. It's my job to analyze the software --
Q. Okay.
A. -- which is itself a trigger to the control center.
Q. Yeah, so it could be a trigger itself, right. So who should be -- whose role is it to look at the pressure drops and --
A. It's the operator's job to look back and examine the pressures --
Q. Okay.
A. -- as they exist in the pipeline. It's my job as an MBS analyst to use that same information to confirm whether the software is working correctly or not.
Q. And col sep is -- what's -- col sep is the same as saying the software's working or not?
A. Column sep in material balance is referred to as a point when the model has now become unreliable --
Q. Okay.
A. -- in that --
Q. At that -- only at that point where the col sep is, though?
A. No.
Q. No?
A. Anywhere we're within the boundaries of the flow

meters --

MR. BARLOW: Yeah, within the material balance area that's one of the --

MR. NICHOLSON: Oh, that's in the segment --

MR. KNUDSON: Right.

MR. BARLOW: In the segment, yeah, --

MR. NICHOLSON: -- column --

MR. BARLOW: -- material balance --

MR. NICHOLSON: -- exists.

MR. BARLOW: -- that --

MR. NICHOLSON: Okay.

MR. BARLOW: -- that the hydraulic software that we use it explicitly indicates that it's unreliable under column sep conditions, that the hydraulics are no longer there to make it reliable.

BY MR. NICHOLSON:

Q. So if you had it on the suction side of Marshall then everything from Mendon to Marshall was unreliable, that whole section.

A. If the column -- when everything is fairly -- would have been reliable up to the point when the first column separation existed from the injection point or the source location on the pipeline.

Q. Right. But the farthest upstream that it occurred was Marshall, I thought inlet of Marshall, right?

A. I'm not even sure --
Q. Or did (indiscernible) --
A. -- if it even existed at the inlet of Marshall.
Q. Oh, okay.
A. I think my calculations showed it at, I think, 317 or something like that or 340. I'm not really sure exactly. It was a couple miles --
Q. Is that a mile post?
A. -- it was a couple miles upstream of Marshall.
Q. Okay. So you didn't go that direction at all. When you saw these col seps your first thought was to look at pressures needed to put it back together.
A. Right --
Q. Okay.
A. -- because my -- because the model was unreliable at that point and it will not become reliable until those columns are integrated.
Q. So then that's an interpretation of a temporary alarm, I think, by the procedure, right?
A. We don't have --
Q. Or a false alarm, is that what they call it?
A. No.
MR. BARLOW: Yeah, in this --
BY MR. NICHOLSON:
A. No. It's -- we refer to our alarms as being either a

five-minute alarm, 20-minute alarm or a two-hour alarm. The control center has a procedure that differentiates between what they consider a temporary alarm --

Q. Okay.

A. -- and we don't use that procedure. That's not our procedure. That's theirs.

Q. Our meaning the MBS group.

A. The MBS analyst --

Q. Okay.

A. -- and anyone else within our group.

Q. Well, okay so that's really on the control center side --

A. Right.

Q. That's for the operators.

A. That's for the operators.

Q. That's their language and their --

A. That's their language and that's for them to use.

Q. -- interpretation. Well, that clarifies that because I was asking this question a lot. I'm not sure I was getting a straight answer. Your calling back and saying it's col sep but you don't call back and say it's valid or --

MR. BARLOW: We don't (indiscernible) --

MR. NICHOLSON: -- invalid --

MR. BARLOW: -- (indiscernible). We don't say it any --

MR. NICHOLSON: That's their --

MR. BARLOW: Their call --

MR. NICHOLSON: -- determination.

MR. BARLOW: -- yeah, and that's their language --

MR. NICHOLSON: Okay.

MR. BARLOW: Our -- yeah, as Jim said -- job is to look at -- try to -- when you get an alarm you try to assess the cause of the alarm and to see if the system is working. The cause and the terms of there's any explanation for the alarm if the model is working correctly and that actually could be anything from instrumentation to other issues. If we don't -- if we can't see any explanation for the alarm and we try to -- and build instrumentation or whatever may happen then we'll say the system is behaving as it should and so it's -- there's an imbalance there the system is behaving as it should and then that's the information that's passed to the control center.

MR. NICHOLSON: Okay.

MR. BARLOW: And if there's a column separation condition we can identify that, yes, there's a column separation which makes the model degraded and not reliable at that point.

MR. NICHOLSON: Okay.

MR. BARLOW: Um-hum.

BY MR. NICHOLSON:

Q. And I'm going to go ahead and jump to this -- I've got this procedure here. It's like a flow chart it looks like --

MR. BARLOW: Yes.

BY MR. NICHOLSON:

A. Right.

Q. You're familiar with this.

A. Yes.

Q. Because I think Shane used it, as well.

MR. BARLOW: Um-hum.

BY MR. NICHOLSON:

A. Right.

Q. And what I -- I just want to see if I can follow the path. So you got called on a five-minute, right?

A. Yes, I get called -- the first alarm that came in would have been the five-minute alarm.

Q. So from that you navigate to the imbalance historical display.

A. Right.

Q. Which is -- I'm trying to picture that. We just looked at the (indiscernible) --

A. That would have been the second one and you click and you select the section for the five-minute --

Q. Oh, okay.

A. -- alarm and it'll take you to the next page which will show you where each of the individual sections are along with where the imbalance can be identified where the --

Q. That's the tabular display.

A. Yes.

Q. Okay.
A. It's --
Q. It's not a graphical display.
A. No, it's not a graphical --
Q. Okay.
A. -- display.
Q. I remember that.
A. The imbalance itself, when you go to that page it's just a text display.
Q. Right.
A. And -- but there is -- you have the option of selecting the underscore I, it's called, or the imbalance and it'll show you a trend of each of the sections.
Q. Is that a volume --
A. That's an imbalance display --
Q. -- trend or is that a volumetric flow rate trend? Is that the meters cube per hour.
A. It's simply a volume metric --
MR. BARLOW: It' -- yeah. It's an imbalance in cubic meters.
BY MR. NICHOLSON:
A. -- imbalance. Right.
Q. Okay. All right. We saw that one. Okay. And then it says at the very bottom of this it sends you over to determine start time location pattern of diagnostic flows, right?

A. And that comes from that underscore I.
Q. Okay.
A. You identify the time --
Q. Yep.
A. -- that it occurred and you define the pattern of which it's occurring. You can have multiple sections in there, as well --
Q. Okay.
A. -- so you're looking for a pattern where they're all indicating that they're degrading to the point and dropping below the threshold.
Q. Oh, okay. Right. Yes. Dropping below your (indiscernible) --
A. So yeah, the zero line you have the threshold line --
Q. Um-hum.
A. -- and you have the trend line which was his for each one of the sections within the boundary --
Q. Right.
A. -- area and you'll see it stepping down if all sections are indicating within a five-minute -- indicating the volume imbalance that's associated with a five-minute alarm.
Q. Okay. But then after that it looks like the first step on this page, then, after you determine the start time and patterns it says, and you know these procedures better than I, but it says, "Proceed to all flow trends," and then also, "Proceed to

all pressure trends." Right?

A. Right.

Q. Okay. And to me when you proceed to all pressure trends wouldn't you have pulled a -- wouldn't you have seen, like, the large pressure drop at Marshall?

A. I wouldn't of.

Q. No?

A. I wasn't on at 1500.

Q. But you were on Monday, right and doesn't the -- does the trend not go back 24 hours?

A. No. The trend is set to key to two hours.

Q. Oh, okay. So you were just looking at a two-hour window.

A. Right. Our standard configuration for trending is two hours because it's associated with a two-hour alarm window.

Q. Okay. But you could force it to go back if you had a reason to.

A. Yes.

Q. Okay. Okay. So you were just looking at, basically, a flat line at that point.

A. I was basically looking at it in relation to responding to the five-minute alarm that the operator called me on.

Q. Right.

A. I wasn't responding to any alarms previous to that point.

Q. Okay. So -- but Shane also -- you're supposed to fill out a material -- what is that -- material --

A. Yes.

Q. -- balance event or --

A. Submit an MBS event.

Q. Okay.

A. Right.

Q. But you don't go back to review prior --

A. I believe I said in my statement I went back under the context of the fact that I trained Shane --

Q. Yeah.

A. -- and --

Q. Now I do --

A. -- and the rest.

Q. -- remember that conversation. Yes, I'm sorry.

A. I went back in order to ensure that clarity of information was provided in the MBS event. I would not go back and review it unless Shane brought it to my attention that there was some type of a problem he had analyzing it or --

Q. Okay.

A. -- if one of our line custodians or other -- one of our senior people had asked me to look back I would look back. But I was satisfied with what Shane had recorded as being reflective of what happened when he responded to the alarm.

Q. Yeah, I saw his write up and I want to -- as long as

we're talking about that, then, because you said you trained Shane, right?

A. Yes.

Q. Okay. That's why you have the vested interest in it.

A. Right.

Q. But now Shane, when he got his five-minute the day before he would have gone through this same flow chart, right?

A. He would have been through the flow chart, yes.

Q. Yeah. Okay. So when he gets to this section here after he's looked at the diagnostic flow pattern he's told to proceed to all flow trends and all pressure trends, as well. Right?

A. Right.

Q. Okay. So wouldn't he have seen -- he would have seen it on his two-hour window.

A. I believe by the time the call was made from the operator to him and by the time he got to and brought up Line 6 the alarms had already cleared.

Q. Oh. So he might not have made it to this step.

A. He might have got a partial way through there depending on what he was doing.

Q. Oh.

A. I'm not sure if he was engaged in any other task like maybe responding to an alarm on another line or whatever. I'm not sure what he did and I've never discussed with Shane what he was doing at this particular time.

Q. Okay. So that clears -- but now the discussion we had just a while ago about, you know, the zero flows and the, you know, over a certain time it's going to clear --

A. Right.

Q. -- itself just simply because there's no imbalance. I mean, that sounds like it's pretty well understood by your group. Isn't that always going to be the case on a col sep that it will clear itself?

A. Not necessarily associated with a column sep. I mean, there are many reasons why an alarm will clear. It simply can be doing like a loss of data for a few seconds out of a few scans. It changes quickly and it takes time for the model to catch up to that.

MR. BARLOW: And also during the column -- I mean, the hydraulics are no longer correct so we don't believe the hydraulics when we see -- in the column separation condition we can't necessarily follow and that's why it's degraded at that point.

MR. NICHOLSON: So if it's degraded and you can't believe it and it clears then, really, you can't believe that it cleared, can you? I mean --

MR. BARLOW: Well, it does clear because it's a cleared event but it doesn't mean --

MR. NICHOLSON: Yeah.

MR. BARLOW: -- it doesn't mean that --

MR. KNUDSON: It doesn't mean the condition has gone away --

MR. BARLOW: That's right.

MR. KNUDSON: -- that got generated.

MR. NICHOLSON: So that seems to be pretty well understood by --

MR. BARLOW: Yes.

BY MR. NICHOLSON:

Q. -- you guys. Would Shane have had that same level --

A. Yes.

Q. -- of understanding?

A. Yes. Because Shane was trained in that under the current process or procedure that we use is that if you respond to an alarm and you observe a column separation you confirm with the operator the existence of the column separation. If the operator confirms this then you accept this as being the probable reason for why.

Q. Okay.

A. And at that point you pass on to the shift leader or the supervisor in the room that the reason for the alarm is a column separation and the model is now unreliable.

Q. Okay.

A. And by fact of stating that there's a column separation it's understood amongst the shift leads that we are referring to the model being unreliable.

Q. And back on the 25th, I think it's changed, but back on the 25th the operator could actually get to the same MBS screens.

A. Yes.

Q. Okay.

A. Yes, he could have reviewed the same information that Shane would have reviewed. At the point -- at the time -- back at that point all of the screens were observable. The only one who has input into them is the analyst. In other words, the shift --

Q. Okay.

A. -- lead wouldn't be able to turn off the pressure transmitter or turn off a flow meter --

Q. Sure. Right.

A. -- but the analyst would have been able to.

Q. Can a -- does the shift lead even -- is he able to make heads or tails out of those displays? Are they trained?

A. Rick was one of the ones that did it. Like, this is back while I was still an operator. Rick did some of the training for the shift leads.

MR. BARLOW: When they were originally designed they were designed for actually for analysis by the shift lead and for -- to make them analytical displays. However, from the very beginning we provided support for the analysis from this. We used to do this off site but with the MBS analyst position we decided to have an on-site person that would, then, provide that analysis. So the shift leads, historically, had the option of doing it but

never took the responsibility for doing it. They -- it was not their job to analyze them. So they could look at them but they -- it wasn't part of their --

MR. NICHOLSON: Okay.

MR. BARLOW: -- procedures.

MR. NICHOLSON: Okay. And especially since you created the position of the analyst.

MR. BARLOW: Yes, the idea of the analyst was to have a on-site position to provide primary response for the MBS on-site rather than offsite.

BY MR. NICHOLSON:

Q. Would Blaine have had a good understanding of what that meant, col sep and unreliable models? When you got on the phone then with Darin and Blaine does Blaine have a background that would have allowed him to understand the --

A. I --

Q. -- the language.

A. -- believe the reason why Darin asked me to participate in the phone conversation was because Blaine would not have had that much experience with the MBS displays.

Q. Okay.

A. I'm not sure what Darin's statement was but that's -- to my belief that's probably why he asked me because this wasn't something that I've ever been asked to do before.

Q. Oh, really? Okay.

A. Not be involved in a phone conversation with their supervisor.

Q. Okay.

MR. BARLOW: But historically, yeah -- yes, the shift lead and the operators would normally not --

MR. KNUDSON: Right.

MR. BARLOW: -- be going through the displays.

MR. KNUDSON: Right.

BY MR. NICHOLSON:

Q. All right. One of the conversations you had while you were on the phone, and I think Darin even -- I mean, Darin sort of questions I think as you guys talked about the pumps and pressure. Darin makes a statement, I put so many cubes in, I think it was 1,600 cubes, and normally we think it takes 600 to pack the line. Where is it all going? And you came back, you know, you had sort of an analysis that included line pack on the system and I'm just trying to get a good handle. I understand line pack in a sense like a gas system, a compressible. But an incompressible liquid I -- how much packing can one do on a (indiscernible) --

A. I really can't answer anything that has to do with that conversation. I've never had an opportunity to review the transcript so I don't really remember what I said.

Q. Okay. I've got them here. Would it help if you -- and I don't even think we really need to go over them I was just -- I'm just asking you from --

A. Yeah, I've been asked --
Q. -- experience --
A. -- I've been asked -- I was asked to assume the internal review and I said then that I'd never had a chance to review the transcript.
Q. Oh, okay.
A. Now, what I remember is, you know, is in a generality and informing Blaine what he needed to know about MBS.
Q. Uh-huh.
A. And that was within the context. Now, I wasn't, from start to finish, engaged in that full conversation. I was asked to join it after Darin had spoken to Blaine. So whether I was there beforehand or I remember leaving after -- leaving before Darin was finished talking with Blaine.
Q. Oh, okay. So at some point in this conversation you actually get out of it.
A. Yes. I --
Q. Okay.
A. -- I simply -- I answered the questions that Blaine had asked of me and I provided the information on MBS to Blaine.
Q. Okay. So you actually participated in an internal interview already regarding this?
A. Yes, I think all of the people that were interviewed by the NTSB initially were.
Q. Okay. Well, then I'll just -- I can't find the exact

section right now but just in general the line pack, it's not something you typically calculate or deal with.

A. I don't think I would have been talking about line pack. I think I would have been talking probably in terms of what the MBS would have indicated. In other words, what the pressure would have been upstream of Marshall and where I would have considered where we -- where the pressure would have been getting to the point of zero or where the column separation actually existed. I don't think I would have been talking about line pack because I'm not involved with analyzing any of the flow.

Q. Okay. Maybe we'll come back to that. I think I found this conversation.

A. Okay.

Q. But in general, you don't typically get into line pack calculation or --

A. No, I wouldn't get into a calculations but I would have probably made reference of it only in terms of what was going on, operationally, with the line as I would have observed it through MBS.

Q. Okay. I'll ask this again. I think I sort of asked this but I might have done so in a roundabout way but I'm just going to ask it direct. Why didn't a leak scenario make sense to you when you were looking at those?

A. It wasn't that it didn't make sense.

Q. Okay.

A. It's just that from the -- from an MBS the model was unreliable to the point that I could derive that from it.

Q. Okay. So the model was unreliable and you can't get --

A. Yes. Well --

Q. -- the information you need out of it.

Q. -- from knowing that -- knowing from looking at Shane's MBS event which I said I reviewed to make sure that content was in there, knowing that the column separation had existed on the shutdown at 1500, I accepted that that column separation that existed on startup probably would have been dealt with by the day shift and that it probably wasn't passed on to me that this was an area of concern. So when we started up, as far as returning whether I considered this as being a potential leak or it being a column separation, I dealt with it simply as it was passed on which was it was a column separation. That's what was indicated by our MBS.

Q. You weren't involved earlier on when Darin -- Darin was doing some calcs to figure out drain up and how much --

A. I was -- generally the analyst did not get involved in any type of calculation that has to do with volume because we do not have that information available to us.

Q. Okay.

A. That would have been information that would have been derived from CMT which we don't use.

Q. Okay. Right.

A. Not in the context of --

Q. Right. Only its interface with the MBS software.

A. Right.

Q. Another discussion or statement in your transcripts that I wanted explore here on pages 23 and 24. Let's see, 12 through 15. I'll just read it like I've got it here. "Please clarify the discussion on page 23 and 24…" and I might have to hand you my copy, "…where there was sufficient time for the column separation to absorb the losses and that's how the model compensates and clears alarms because it makes that determination that this is where the flow went." I'm trying to understand and find and I think you're trying to explain that to why it -- that's right here, actually, on page 24. And I think it just reflects back on the discussion we were having -- you can't find it on here it's this highlighted discussion here and you talk about reabsorbing the flows.

A. Right. And this is in reference to what I was saying. We didn't observe any flow on the Marshall flow meter --

Q. Okay.

A. -- which meant that all of the energy that would have been provided from Griffith in the form of 1,900 cubic meters per hour would have been going in to integrate the column, in other words, to pack the line to the point it would have rose above vapor pressure.

Q. Right.

A. So that's kind of what I was pointing at is that you -- the column would need to be put fully together before we had registered flow on the Marshall flow meter.

Q. That's what you're trying to say there?

A. Yes.

Q. Okay. And the re -- what do you mean by the reabsorbs or the -- oh, you're saying (indiscernible) --

A. I think I was just --

Q. -- losses --

A. Right I was trying to kind of generally refer to what would be happening during an integration.

Q. Okay. In that same discussion you mention that, "Alternate methods must be used and will have to be used for leak detection until the columns are integrated."

A. Right.

Q. Did you relay that information to the shift lead?

A. I would have relayed to the shift lead that the column separation hadn't been put back together and it is commonly known by all shift leads that when a column separation exists that the model is unreliable.

Q. So then they need to rely on pressure --

A. Right. It isn't something that I would need to refresh a shift lead on each and every time a column separation occurs. It's something that should be known by them that by reference of column separation that until the column is intact that the MBS

would be unreliable.

Q. Is there -- is anyone in your group running simulators? Can anyone have run a simulator to confirm your analysis or --

A. Not at 3:00 in the morning.

Q. No. There's no on-call guy?

A. No. We don't have --

Q. Okay.

A. -- actually it would have been me that would have been running it -- probably me or one of the engineers because I --

Q. Do you have access to those simulators?

A. I do now in my current position.

Q. Okay.

A. I would have had access to a trainer, as well, but I would have had no reason to do that. I would have had to been instructed by the control center or requested. The control center would have had to request that information of -- for me to do that.

Q. But a simulator would have allowed you to say if I were a shift lead and I really didn't trust my hand calcs I could actually kind of just run through a every other station startup and confirm for myself I could build the pressures I thought I should build?

A. Well, it would be more prudent to count on my calculation based on the fact that the shift lead confirmed, within ten pounds, that my calculation was correct.

Q. But he was using the same methods, right, the line loss --

A. I'm not sure what he was using.

Q. Oh. Okay.

A. It's -- he might have been using something different. But in order to be able to run this particular scenario I would have had to had the line filled. I would have had to build that into the trainer. I would have had to configure the trainer to do this.

Q. Okay.

A. I would have had to -- I mean, this isn't something could do in 15 minutes. This is something that might require anywhere from four to six hours --

Q. Ah, okay.

A. -- to prepare.

Q. You can't just run over and hit a button.

A. No.

Q. And I just want to confirm I think you covered this pretty well in your transcripts but I'll -- I just want to hear it --

A. Right.

Q. -- again that the changes that you had made, you talked about the HF block to --

A. HF --

Q. -- the bypass work --

A. It's a HF device.
Q. Yeah.
A. It's the header force or header flow --
Q. Okay.
A. -- device.
Q. It had -- it made no difference, essentially, in the model once you --
A. Well, at the time when I did it I wanted to remove anything that would have caused a delay in the integration of the column at Marshall and I felt observing 180 pounds of suction pressure and 50 pounds of discharge pressure that were incorrect, that were being calculated due to the fact that the transmitters were behind the station valves and not on the mainline I felt that it was prudent at that time to do something about correcting this.
Q. Okay. And after you fixed that what do you do with that? Do you submit a Facman or how does that get fixed permanently?
A. The fix for it permanently?
Q. Yeah, so that you can -- next time they bypass the station --
A. It actually I believe it was recorded even before then. We --
Q. Okay.
A. -- have what's -- we track a lot of our activities on our models in JIRA, what's called a JIRA issue.

Q. A what? I'm sorry.

A. We -- it's a management system that we use to track changes --

MR. BARLOW: It's called JIRA. It's an internal issue tracking --

MR. NICHOLSON: JSRA --

MR. BARLOW: -- system. JIRA --

MR. NICHOLSON: Okay.

MR. BARLOW: -- that we use to track issues.

BY MR. NICHOLSON:

A. So the issues that would have been associated with Niles would have been probably recorded because this is something that we're -- we have -- we've -- in the last year to two years we have this ongoing activity where if we notice problems that are associated with data and where the data is being brought in. If we find that they're SCADA points --

Q. Okay.

A. -- in pressures or flows we bring this to the attention of SCADA then we review the model to see whether that particular information is available to the control system. If it is available to the control system then we will request that to be added to the RQ data for the MBS.

Q. Okay.

A. So we've had this ongoing activity that myself and some of the other analysts are doing where we went in and we would

review the data that's on each of the lines and determine what data is missing or what data we could be included in with it. Then we forward this to the line custodian who's responsible for the line. The line custodian would then --

Q. Who is the line custodian? I've heard that term --

MR. BARLOW: Do you want me to explain?

MR. KNUDSON: Yes.

MR. NICHOLSON: Is that an operator?

MR. BARLOW: No. No. It's a member of our team in the Pipeline Modeling group.

MR. NICHOLSON: Oh.

MR. BARLOW: It's an engineering person who has either built or responsible for maintaining the model and any changes that happen.

MR. NICHOLSON: The model in the MBS group.

MR. BARLOW: The MBS model.

MR. NICHOLSON: Okay.

MR. BARLOW: Yes, and that's a line custodian and we have line custodians assigned to each of our MBSs.

MR. NICHOLSON: So who's the Line 6 custodian?

MR. BARLOW: That was Ted.

MR. KNUDSON: Yeah, Ted.

MR. NICHOLSON: It is Ted.

MR. KNUDSON: Yes.

MR. BARLOW: Yes.

BY MR. NICHOLSON:

Q. Okay. We talked to Ted.

MR. CHHATRE: And just when --

MR. NICHOLSON: Go ahead.

MR. CHHATRE: -- when you speak maybe identify yourself as Rick otherwise it might get confused by the person who's doing the --

MR. BARLOW: Oh, okay.

MR. NICHOLSON: Yeah. We're having this transcribed.

MR. CHHATRE: Just for future reference.

MR. BARLOW: Yeah, so Rick is speaking now.

MR. CHHATRE: (Indiscernible) and not Jim but.

MR. BARLOW: Yes. I'm sorry.

MR. CHHATRE: It's difficult to do that, you understand, I'm just saying.

MR. BARLOW: Yes, Um-hum.

BY MR. NICHOLSON:

Q. It's -- this probably doesn't happen but I'll ask. Do you ever get MBS alarms that were due to inaccuracies in the model like wrong pipe diameter?

A. Not due to physical problems.

Q. Okay. So it's pretty accurate in that sense.

A. Yes.

Q. Okay. I think at this point I'll pass it on to Karen and we'll make rounds.

BY MS. BUTLER:

Q. Just on that last point when you said not due to physical problems, how can you decide that you don't have a physical issue associated with the model rep?

A. It's not my job to decide, Karen. That would be the line custodian and Ted would have probably cleared that up with you today.

Q. Okay. So it's not that you might not know that you have a physical problems it's just that that isn't something that you've had discussed with you.

A. Right. If there were to be any type of physical problems that would have been communicated from the line custodian to any of the analysts to be aware of any type of situations like that.

Q. Okay. I got ya. Okay. And if there had to be a change based on that then the line custodian would do the change. Is that correct?

A. You mean changes as in the physical characteristics?

Q. Yeah.

A. Yes, it -- that would always be done by a line custodian.

Q. Okay. Okay. When you have noticed things like you just mentioned JIRA, right, what does that stand for again?

MR. BARLOW: Yeah, Rick speaking. It's called -- it's JIRA. It's a software tool and I must admit I'm not exactly sure

what the acronym means.

MS. BUTLER: Okay.

MR. BARLOW: It's -- it is a common -- we've used it throughout Enbridge and it's a common industry issue tracking software.

MS. BUTLER: Okay.

MR. BARLOW: And I'm sorry I don't know what actually JIRA means.

MS. BUTLER: That's fine. I'm pretty sure I've heard of it before but then I got to thinking we'll maybe that's something they developed in-house.

MR. BARLOW: No. It's a product that we --

MS. BUTLER: Okay. And all you're doing with that is tracking issues. Right?

MR. BARLOW: Yes. We use that -- Rick speaking again -- we use that to track. It's just one way that we do track issues is --

MS. BUTLER: Okay. So when you use the JIRA when you make an entry into JIRA is that called something specific or is it just an entry into the software tool?

MR. BARLOW: It's -- yeah, Rick speaking. It's an entry into a software tool. It's an issue. It would be identified as an issue and then within the software tool you could identify and use it to track that issue.

MS. BUTLER: Okay.

MR. BARLOW: Yes. Uh-huh.

MS. BUTLER: And so if people such as MBS analysts thought there needed to be certain enhancements it would go in through that software tool or would it go in a different pot?

MR. BARLOW: Yeah, Rick speaking again. Normally that's, yes, that would be our normal way of tracking changes, recommended changes or observations. It may be originally identified through an e-mail and then investigated and then the line custodian may, at that time, start a JIRA issue so that could be tracked until it was resolved.

MS. BUTLER: Okay. Are some things just done by e-mail instead of making it to JIRA because they're simple enough and it makes sense?

MS. BUTLER: Yes. I would say that some -- occasionally some small things are done that --

MS. BUTLER: Okay.

MR. BARLOW: -- you don't go through the whole process.

MS. BUTLER: Okay. So I know that one of the things that kind of was confusing for me is different training levels that people have on the leak detection system itself. So we've got the line custodian that I take it has to have an extensive amount of training on the Stoner software as well as some modeling practice and then we -- is there other training that goes into that, like, do you send the line custodians to specific training and the MBS analysts to a different set of training? Can you talk

to me a little bit about your training?

MR. BARLOW: Do --

MR. KNUDSON: Yeah, I'll take this.

BY MS. BUTLER:

A. Initially when the MBS analyst 24/7 position was started up I was the first one that came over and one of the first tasks that I had starting into this position was to collaborate with all of the existing line custodians to develop a training program for the MBS analysts. Now, Rick and three other engineers that were with MBS or Pipeline Modeling at the time contributed to the formation of the training program as it exists today.

Q. Okay.

A. Now, that information was used to train the rest of the analysts and it's been our ongoing practice to review and revise that training material based on collaboration of all members of our team.

Q. Okay. All right. So one of the things that doesn't seem quite in sync with me is the fact that I'm not sure that the control room understands much, really, about the model. Do they have any specific training on the leak detection system itself?

A. Since the analysts have been in the room 24/7 I've encouraged the other analysts to make sure that they partake in some of the orientation with the new operators as they come on shift in the control center and we usually approach the mentors and offer to do an MBS orientation for each of the new operators

and I believe that's still an ongoing practice that's used.

Q. Okay. One of the things that kind of surfaced today that I don't think has translated to the control room, and I'm interested in your thoughts on this, is that when you have two column separations that the area in between those two column separations is, basically, not capable of being computed at all by the leak detection system and so, really, in that area it's invalid where on other areas of the pipeline it may be valid, like, from the injection point up to that first column sep. Has it been your experience that they understand that concept between column seps, the model's not valid?

MR. BARLOW: Yeah, Rick here. Hi, Karen. Yeah, maybe I can correct it a little bit. It isn't that the model -- the -- we consider the model not valid within the volume balance region which is bounded by flow meters that those column separations occur. It's not between or up to the column separation, it's within the entire region is where. So our MBS imbalance regions which are separated by flow meters, those are the ones that we use, you know, and there's -- by stations, wherever we have the stations, that's our smallest unit would be an imbalance region. Any column separations within that region would be considered making the model hydraulically incorrect and not reliable. It isn't between or up to the column separation, it's the entire region bounded where the column separation occurs bounded by the flow meter. So does that clarify it a bit, Karen?

MS. BUTLER: It's helpful. I'm not sure that it matches some things other people have told me but I don't know that that matters, really, that it matches as much as I get a better understanding of it.

MR. BARLOW: Yes.

BY MS. BUTLER:

Q. So from the standpoint of, let's just take the Marshall event one more time and I'm sorry to keep rehashing this, you're probably sick of discussing that one particular event. But it's the one that we all are most familiar with when we're looking at the column separation. So if we were looking at what happened there and we did have a column separation upstream of Marshall, correct?

A. Yes.

Q. Okay. And --

A. You mean in context of what I was looking at as the analyst --

Q. Yeah, I believe so.

A. -- that night? Yes.

Q. Yes and I think when you were looking at it we also had a column sep downstream of Marshall.

A. Yes, I believe there was five in total, column separations --

Q. Right. That's what I remember, too. Okay. So the portion of the line that actually goes from Griffith to Marshall,

now Marshall would have been the first flow meter downstream of Griffith. Correct?

A. Yes.

Q. Okay. So since there's a column separation on the suction side of the Marshall flow meter then that, in your mind, would mean, and there were obviously a lot of column separations downstream of that, then would that have meant at that time that the entire model was incorrect?

A. My understanding would have been the model would have been unreliable at the moment they opened up the block valve at Stockbridge where they made the flow line from Griffith to Sarnia. While the block valve was closed at Stockbridge, then the section between Griffith and Marshall would have been intact and would have been reliable.

MR. NICHOLSON: Even with the column separation?

MR. KNUDSON: If with the column separation it would have been unreliable but it was my belief that while the block valve was closed at Stockbridge that there was no column separation at Marshall, that this only occurred on the shutdown.

MR. JOHNSON: Because the alarm cleared.

MR. NICHOLSON: Oh, okay.

MS. BUTLER: Oh, I see what you're saying.

BY Ms. BUTLER:

Q. So historically, you're not talking about having gone back and looked to see if that column separation was there.

You're just saying that you were under the impression that that column separation that happened on the end of the first shift had cleared.

A. Right.

Q. Okay. So --

A. My belief was that the column separation occurred. The model became unreliable --

Q. Right.

A. -- at 1500 and --

Q. Right.

A. -- this alarm cleared and we still had the existing column separation at Marshall and that this column separation was verified by the day shift.

Q. Uh-huh.

A. And I would have expected it would have been investigated or looked at.

Q. Okay. So when you just --

A. But it would have been considered probably a non -- it would have been -- if it had been passed on to me that there had been a problem in that area it would have been identified as an anomaly and it wasn't identified as an anomaly when I came on shift.

Q. Okay. So when you say when they open up the Stockbridge valve you're talking -- we're getting ready to start the pipeline for the first time at 1:00 in the morning or whatever.

A. Right.

Q. Right? That that first startup then that's when you're saying you would have thought that the column separation, anything that had been there before, would have been gone or -- so Griffith to Marshall was reliable or what am I missing in opening up Stockbridge with the previous column seps?

A. Well, the closure of the block valve at Stockbridge --

Q. Uh-huh.

A. -- was closed after the line was shut down.

Q. Right.

A. And the line was isolated. Therefore, the section between Stockbridge down to Sarnia, anything that would have been in that section was associated with the closing of that block valve which would have occurred at 5:00 the previous morning when they started the Stockbridge delivery.

Q. Right.

A. Now, when they start up the line at 1:00 they open that block valve --

Q. Right.

A. -- which now makes the pipeline section, instead of being from Griffith to Stockbridge, the pipeline section now is from Griffith right through to Sarnia which incorporates the four previously discussed column separations plus the one at Marshall.

Q. Okay. So previously because you thought the column sep had been taken care of on the previous shift --

A. Not necessarily taken care of but the column separation would have been, to my understanding, would have been acknowledged as a non-anomaly.

Q. Okay. It was explainable.

A. Right.

Q. At -- is that a better way of putting it?

A. Yes.

Q. Okay. All right. So because the first one we thought was explainable then one concept here that kind of confuses me a bit is in your opinion is the model capable of still being reliable when the pipeline is shutdown and you don't have leaks?

A. The model is reliable when the pipeline is shut down providing that there are no column separations existent on the section of pipeline that we're talking about.

Q. Okay. So on this particular pipeline is it true that unless the Stockbridge valve is closed when we shut down we will always have a column separation at Leonard?

A. The current practice of operating Line 6, in my experience, has been that in order to shut down Line 6 and be able to close without having a high holding (ph.) shutdown occur at Sarnia --

Q. Uh-huh.

A. -- it means that these columns will be broken.

Q. Okay.

A. You cannot hold enough pressure at Sarnia to create an

elevation profile that will be above vapor pressure at all points back up to Stockbridge.

Q. Okay. So basically, then, it would just be a matter of looking at where the flow meters are and where your column seps are and if you don't have any column separation between Griffith and Stockbridge and you close that Stockbridge valve on shutdown then you have a good model between Griffith and Stockbridge but you have an unreliable model from Stockbridge to Sarnia.

A. Right. And that's under the assumption that all instrumentation, be it pressure transmitters and flow meters, are available and working --

Q. Got ya.

A. -- in that section.

Q. Got ya. Got ya. Okay. So thanks for that education. Okay. So now that we know that moving on to the next phase of it which is when, you know that you have a particular line that operates this way due to elevation profiles, you know, I've seen a lot of operators go in and they make changes to that line or they try to be able to hold pressure with back pressure control valves or they do some rearrangement in certain sections when it continues to be a problem. Is that anything that you guys are -- have ever contemplated or make recommendations on as analysts?

A. No. We do not make any recommendations whatsoever on how the control center should operate their pipeline.

Q. Not so much operational as it would be to improve leak

detection capability.

A. I think we make a bit a noise, at times, about the occurrence of column separations --

Q. Okay.

A. -- and if the control center can do something about it. But I think we do it more so not individually but more so probably as a group.

Q. Okay. Do you know if that's ever been more than just chatted about around the room?

A. Rick's going to answer that.

MR. BARLOW: Yeah. Rick will answer. I'm trying to think if there's any conditions. I know that we have -- there's been discussion before on other lines about the addition of pressure control valves and things to prevent a column separation. We've been, maybe, party to those recommendations and discussions. I don't -- yes, so I think it can be. It isn't a frequent occurrence and most of it in the case of operational issues were probably, as Jim suggested, just we acknowledge that there's a problem on these column separations and we've noted that.

BY MS. BUTLER:

Q. Okay. So on Line 6B, you didn't mention that one, so do you have a concept that Line 6B that's not even feasible simply because maybe the condition of the pipe you wouldn't want to put more pressure in certain areas or do you have any knowledge of that or has anybody discussed that?

A. The only discussion I would have had in regard to this would have been back when I was an operator which would have been five years ago operating Line 6 and the discussion I had was with the Sarnia operator who controls the delivery valve.

Q. Right.

A. And I remember having a conversation saying, you know, please try to hold this pressure and being told, no, we can't hold that pressure because the minute the delivery valve is opened it'll go over my maximal allowable pressure at the station --

Q. Okay.

A. -- or at the terminal.

Q. Okay. So we've got like a back pressure hold that when we let it go it over pressures the piping in the station or a manifold or something.

A. Yes.

MR. JOHNSON: Well, but that's based on five-year ago information.

MR. KNUDSON: Yeah.

MS. BUTLER: I know. I'm just saying that that may be part of the conversation. Okay.

BY MS. BUTLER:

A. And this wasn't some -- this isn't a conversation that took place in July. This is a conversation that would have taken place, like, five years ago.

Q. Got ya. But it's good for me to understand how, over

time, there's been conversation. It's just there may be a whole host of reasons why that hasn't floated to the surface, including over pressure considerations at the terminal.

A. And there are other things to consider as well, Karen, as I mean it's the line fill conditions. It's what's, you know, the limits that are on the line, you know, which I'm not --

Q. Right.

A. -- aware of what they are today.

Q. Right. Yeah. Based on that -- since you mentioned that we'll just hit that for a minute. In your experience having been an MBS analyst have the column separation conditions increased over the last five years on Line 6B?

A. I've only been an analyst for three years and I don't think that it's been any better or any worse.

Q. Okay.

A. Not that I would have noticed, you know, either way.

Q. Okay. So to your knowledge lowering the pressures in the line hasn't necessarily increased the occurrence of column separation.

A. I really couldn't answer that, Karen, because I don't operate the pipeline.

Q. Okay. All right. Okay. All right. So do you ever look at the liquid fraction display?

A. I will look at it if I feel that when I look at the flow profile --

Q. Uh-huh.

A. -- that I observe the headline at or near the elevation at that particular time and look at the flow, whether I can observe two-phase flow, then I will usually navigate to where the liquid fraction display would be.

Q. Okay. So when you gravitate towards the liquid fraction display do you check out the pressure line on the bottom or is that just something that's there and it --

A. Generally, I would have been aware of the pressure before I would've looked at the liquid fraction display.

Q. Okay. You would have been?

A. Yes.

Q. Okay. Okay. So on training we kind of discussed that. I think that you put together a training package so --

A. Not me but our -- Pipeline Modeling, as a group, did.

Q. Okay. You were the first one, though right, that kind of had to help consolidate that.

A. Right. I was the first analyst that was -- I was the first one that was hired in the analyst position and one of the tasks that was assigned to me as the first analyst was to prepare a training program.

Q. Okay. So since that timeframe we've kind of talked about the fact that when new operators come on that there's an MBS little presentation or portion that you guys help with. Have you had any more training or gone to Stoner or any additional classes

in the area of hydraulics or the model specifics?

A. Nothing specific for hydraulics but I have attended a training session where we had Advantica Noble come up and provide a presentation for us and do a two-day training session. And our actual training is more ongoing where, you know, it's up to each individual analyst to recognize something that they don't understand and to approach our senior people to get clarification on further training.

Q. Okay. So Advantica Noble is actually the entity that sells Stoner. Right?

A. Right.

Q. Okay. So you actually had Stoner-specific two-day workshop.

A. Yes. We had a two-day workshop it would have been back last spring, I guess.

MR. BARLOW: Yeah. I think it was last spring. Yeah, Rick here. We've brought -- it's GL Denton Noble is the --

MR. KNUDSON: Right.

MR. BARLOW: -- current company.

MS. BUTLER: Okay.

MR. BARLOW: It used to be called Advantica.

MS. BUTLER: Right. That's how I know it so far.

MR. BARLOW: And it used to be called something -- it used to be called DREM. Yeah. Yeah.

MS. BUTLER: Okay. So based on that two-day workshop do

you guys periodically update your software versions for the leak detection system?

MR. BARLOW: Yeah. Rick speaking. We do update to the most current version that's reliable on the unit systems that we have.

MS. BUTLER: Okay.

MR. BARLOW: We run unit software and so we update it up to that point.

MS. BUTLER: Okay. And so when you do an update is there a standard package of training or associated elements that you go out and teach the MBS analysts?

MR. BARLOW: I'm sorry when you -- your question, Karen, is if we do a software update --

MS. BUTLER: Right.

MR. BARLOW: -- do we then update the analysts?

MS. BUTLER: Right.

MR. BARLOW: Well, first of all we haven't had a software update since the MBS analysts have been on --

MS. BUTLER: Okay.

MR. BARLOW: -- on-site here.

MS. BUTLER: All right.

MR. BARLOW: And so we haven't had the need to do that and most of the software updates are actually -- don't affect the look and feel or the actions of the software wouldn't be expected to change that anyway.

MS. BUTLER: Is there any talk of changing the package?
MR. BARLOW: I'm sorry, Karen. Any?
MS. BUTLER: Any talk of changing the package like getting off of UNIX but --
MR. BARLOW: Oh, yeah. Yes. Yes. There is. In fact, we have a project now we have a project to -- we will be moving to a Windows platform.
MS. BUTLER: And --
MR. BARLOW: And then getting the appropriate software the GL Denton's version for that.
MS. BUTLER: Okay.
MR. BARLOW: Yes.
MS. BUTLER: So when is that planned? I think we had mentioned -- Ted had mentioned --
MR. BARLOW: Yeah. I'm not sure. I'm trying to remember if it's -- there's -- I don't know -- I don't know what the timetable on that. I think it's up in the air about that. There is a capital project to do that but I don't know the -- I can't answer what the timetable is.
MS. BUTLER: So when we would do that will you have --
MR. JOHNSON: Can we -- let's not -- maybe we should talk more on why Jim is here than what we're possibly going to do in the future with Rick.
BY MS. BUTLER:
Q. Okay. I was kind of bringing it bring. Just give me a

minute. Okay. When we were talking about moving ahead my next statement was would we be able to, then, have Jim involved in training on this new system? Is that the plan? And will that impact 6B?

A. That's out of the context of what my position would be.

Q. Okay.

A. Even as an analyst, that would have been something -- that's something that would be decided by our supervisor.

Q. Okay. So from that standpoint you don't know, at this point.

A. No.

Q. Okay. All right. That's fair. Okay. On column separation issues are you aware, now, of the new plan in the control room what the operator will do when we have a column sep?

A. No because I haven't been on shift since August 1st and I haven't been in the position of an MBS analyst since August 1st.

Q. Okay. So is there any other changes that you're aware of that have happened besides the fact that you're on -- not on as an MBS analyst?

A. No. There's no other changes and my role with Pipeline Modeling has changed as of August 1st so I'm no longer involved with MBS analysts.

Q. Okay. All right. Are you the only one that's had that role changed in the modeling group?

A. My role was changed based on a promotion that occurred

at the first of July.

Q. Okay. And so your role is the only one that changed?

A. I'm not quite sure what you mean, Karen.

Q. Okay. That's fine. All right. So based on the fact that you're currently out of Pipeline Modeling, then, right?

A. No. I am currently still in Pipeline Modeling I'm just in a different position.

Q. Okay. So the role has changed in Pipeline Modeling.

A. Yes.

Q. Okay. So since your role has changed in Pipeline Modeling do you see changes that have been enacted since Marshall to help improve either the model or the administration around the model?

A. I have to answer this in context of what Enbridge --

Q. Okay.

A. -- has specified for people that were involved in Line 6. So I'm going to pass this to Jay and let Jay answer this.

MR. JOHNSON: I think it's probably just as well to say that you can't comment on that one.

BY MS. BUTLER:

A. Okay. I choose not to comment on this, Karen, please.

Q. That's fine. And so now we find out that there has been something that Enbridge specified to a few people that they weren't supposed to comment on.

MR. JOHNSON: I don't think that's the case. I just

think that's not --

MR. KNUDSON: No, I just --

MR. JOHNSON: -- a question that Jim feels prepared to answer.

MR. NICHOLSON: Repeat the question, Karen.

BY MS. BUTLER:

Q. It was just about in his new role regarding Pipeline Modeling could you still, in the Pipeline Modeling group -- has he seen changes regarding either the model associated with 6B or other things associated with the administration of the leak detection system?

A. And my answer to that was that I didn't choose to comment because Enbridge has told anyone who has been involved with Line 6, whether being on shift in the daytime or the evening, that they are not to be involved with Line 6 until your investigation is completed.

Q. Okay.

A. So because if that I am not privy to any information that would have involved any changes in the material balance that would have been associated -- or any of the changes in the MBS analyst procedures or practices.

Q. Okay. So what's your new role?

A. My new role it's called an MBS Specialist. What I work on is, primarily, simulations and trainers.

Q. Okay.

MR. NICHOLSON: And when did that occur? When did you get the new position?

MR. KNUDSON: I was -- I knew of the promotion back in July and the --

MR. NICHOLSON: July?

MR. KNUDSON: -- promotion was to take place August 1st.

MR. NICHOLSON: You knew of it July -- before July 25th.

MR. KNUDSON: Yes.

MR. NICHOLSON: Okay.

MR. JOHNSON: So now he may be working on simulator -- simulations and things like that but they're not associated with 6B.

MS. BUTLER: Okay.

BY MS. BUTLER:

Q. So in your new training capacity as an MBS specialist is the leak detection system part of the existing simulation?

A. The leak detection system only shares familiarity with it to the point that it uses the same software engine and this software engine is used both for simulation for trainers and for MBS leak detection.

Q. Okay. So to your knowledge as it exists today on the trainers that the operators go through and the leak detection alarm these simulators.

A. There are no leak detection alarms on the trainer system.

Q. Thank you.
A. Okay.
MR. NICHOLSON: And Karen, why don't we -- I'm going to move on maybe to Brian or Ravi.
MS. BUTLER: Oh, that's great.
MR. NICHOLSON: Just to maybe break it up a little bit.
MS. BUTLER: That's great.
MR. NICHOLSON: Are you okay with that we'll just come back around to you?
MS. BUTLER: Absolutely. Because I was actually done almost.
MR. NICHOLSON: Oh, okay well then --
MS. BUTLER: So that's cool. That's fine.
MR. NICHOLSON: -- you can develop more questions. Brian? Do you want to go ahead and ask some?
BY MR. PIERZINA:
Q. Yeah, Jim. And I just have a couple and I think they'll be fairly quick.
A. Okay.
Q. How do you transfer information on a shift change?
A. We use a white board and we use JIRA and we use the recording on the MBS events and now, I believe, that -- from one of our weekly meetings that someone has developed a actual sheet that they use.
Q. Okay.

A. So I believe that's what it is. But at the time when I was an analyst in the room we generally just jotted something down on a notepad. Anything that would have been turned off in the model, in any of the models would have been recorded on the white board that we have. Any particular issues that needed to be brought forward to the line custodian would have been recorded in JIRA and MBS events would have been filled out, as well, in Lotus notes.

Q. Okay.

MR. JOHNSON: Actually, this is Jay. Ted had said that this morning that it used to be on a white board and since then they went to a actual documentation on shift change.

MR. PIERZINA: Okay.

MR. CHHATRE: Or that an e-mail, he mentioned, I believe.

MR. JOHNSON: No.

MR. CHHATRE: No.

MR. NICHOLSON: No. That was a -- did the white board before and now it's an actual documentation form that they use.

BY MR. PIERZINA:

Q. Okay. So I'm trying to -- so you were aware that MBS alarm that had cleared when you came on shift?

A. Right. Well, Shane passed on to me, you know, in the normal course of relieving somebody, said how was your day, you know? Did you have many calls? Well, I had one at 1500 on Line

6. It was a column sep. They were shutting down going into Stockbridge. The operator said, you know, verified it was drained into Stockbridge and yeah -- and had a couple other calls.

Q. Okay. And I -- please don't think you have to come up with a specific number but I'd really like to get a sense for how many MBS alarms you can get, you know, on a shift or in a week or and I know it varies but I mean, if you had to throw a number out I'd just like to get a sense for it.

A. Well, there's 30 models that we deal with.

Q. So thirty models. Right.

A. So you could get -- theoretically, you could get 30 MBS alarms but that's not the only thing the analyst deals with.

MR. BARLOW: This is Rick speaking. So you'd like some idea of the numbers. Okay. We do track things and it can range, on a monthly basis, from maybe 100 calls to the MBS analyst from a control center. We don't -- the MBS analyst doesn't see the alarms you just get the calls --

MR. PIERZINA: Okay. Sure.

MR. BARLOW: -- on conditions and those calls could be for a number of things, MBS alarms, maintenance issues, other issues. A hundred to 250 on a one-month period.

MR. PIERZINA: And --

MR. NICHOLSON: Was that a week? I'm sorry?

MR. BARLOW: I'm sorry.

MR. NICHOLSON: How many --

MR. KNUDSON: A month.
MR. BARLOW: Per month.
MR. NICHOLSON: For the month. Okay.
MR. BARLOW: Per month. They could range, over all of the lines, from a hundred per month to maybe 250 per month calls.
MR. PIERZINA: And that's --
MR. BARLOW: -- calls. Calls.
MR. PIERZINA: -- and that's per analyst or is that like --
MR. BARLOW: That's -- no, that's for the --
MR. KNUDSON: No, total.
MR. BARLOW: -- for the position.
MR. PIERZINA: For the group. Okay.
MR. BARLOW: Yes, for the group. Yeah.
MR. PIERZINA: All right. All right. Thanks --
MR. BARLOW: Um-hum.
MR. PIERZINA: -- that's helpful.
MR. BARLOW: Um-hum.
MR. PIERZINA: So how many of those would be actually valid or -- now, you don't actually determine whether or not there's a leak, theoretically. Correct?
MR. BARLOW: That's -- that's correct. Rick speaking. We don't do --
MR. KNUDSON: No.
MR. BARLOW: -- leak declarations (ph.). No.

BY MR. PIERZINA:

Q. Okay. But you'd be aware if a leak was determined as a result of an MBS alarm.

A. We would be aware that the -- what an MBS analyst's job is to determine whether the software is working correctly. If we have an MBS alarm that's occurring and the alarm does not clear and the analyst has reviewed the information then he passes on to the control center that the MBS is functioning normally then it becomes the job of the control center to take whatever steps are necessary to pass that.

Q. Sure. Sure. Implementing --

A. Right.

Q. -- of their procedures. I understand. So are you aware of any actual leaks since you've been an MBS analyst that were identified through the MBS alarm?

A. I don't --

MR. BARLOW: Are you aware?

MR. KNUDSON: No, I'm not aware.

MR. BARLOW: Are you asking Jim or --

By MR. PIERZINA:

Q. I was asking Jim, yeah, I'd just like so --

A. No I'm not aware of --

Q. -- in the two-plus years. So you go, I guess, so the point is you look at a lot of alarms and the vast majority end up being no leak identified. Is that correct?

A. Not necessarily. I think --

Q. Okay.

A. -- we go through a number. We handle a number of calls where it is determined that it's -- may be a modeling error and require follow up to one of our senior people or it may be simply that the model was functioning normally and the alarm clears. But to date, as far as being an analyst, I have never been involved where we had an active alarm and we determined that the model was functioning normally, the alarm stayed and it was declared as being a leak by the control center.

Q. Okay. So it sounds like you have a lot of -- you identify a lot of opportunities to improve the model, sometimes.

MR. BARLOW: Yeah, most of the alarms are not modeling problems. There could be communications issues.

MR. PIERZINA: Oh, sure.

MR. BARLOW: There could be instrumentation issues --

MR. KNUDSON: Right.

MR. BARLOW: That's where the majority of the --

MR. KNUDSON: Right.

MR. BARLOW: -- issues come from. So -- yeah. Um-hum.

BY MR. PIERZINA:

Q. I guess I just had the understanding from some of the transcripts that you're always looking to fine tune the model --

A. Yes.

Q. -- and you -- probably that -- this is how you come up with a lot of that stuff so --

MR. BARLOW: Yeah and if we find issues that indicate a modeling issue then we'll go and try and correct that issue.

MR. PIERZINA: Okay. And there was -- I read in a transcript a cause analysis database for MBS alarms. Now, that's not the JIRA --

MR. BARLOW: That's not the -- yeah, Rick speaking. That's not the JIRA issue. It's called MBS reports database. Right?

MR. KNUDSON: Right.

MR. BARLOW: MBS reports database.

MR. PIERZINA: MBS reports database.

MR. BARLOW: Yes.

BY MR. PIERZINA:

Q. And so that -- is that -- so does an MBS analyst enter each call that they get and that's --

A. Yeah.

Q. -- is that what populates the MBS reports database?

A. Yes. Our process is is that as the analyst handles the calls and he records when the alarm occurred, he records when -- the section that the alarm occurred in, the type of alarm it was and he'll also record any operating conditions that might have existed that he gathered from the operator or from the control center. And he will record this information into an MBS event.

If the alarm clears, the time of the alarm clearing will be put on there. Now, our line custodians who are our senior people will review these on a regular basis and make sure that the correct action was taken. As part of our endeavor to improve our analysts and roles in their position, the line custodians take an active part in identifying if something maybe wasn't done correctly or if something was misdiagnosed then they will make sure that they take the steps necessary to ensure the analyst is aware of it.

MR. BARLOW: Rick speaking. Just want to clarify that. MBS reports is for all calls to the analyst, whether it be for alarms or for maintenance issues or for anomaly issues that the control center would like clarification on anything to do. So it isn't just alarms. It's whatever they get calls on --

MR. PIERZINA: Okay.

MR. BARLOW: -- is recorded.

BY MR. PIERZINA:

Q. Great. And I apologize for not knowing the answer to this then do you OQ'd as an MBS analyst?

A. There is no -- currently no regulations that say that anyone needs to be OQ'd because you're not actually operating anything but we do have a process within our training where someone is passed their readiness assessment where we do the testing, both in the form of a question and response to a test environment that we use to replay past alarms, with the idea that the analyst will be tested to make sure he can respond correctly.

This readiness assessment is used to verify that the analyst is now ready to take on his job by himself. The benchmark for whether an analyst is ready in that position is that he can handle 70 percent of the calls on his own. In other words, that when he receives a call he is able to quickly do the analysis and determine what the problem is.

MR. PIERZINA: Great.

MR. JOHNSON: This is Jay. The -- basically the OQ industry group has determined that the analyst is the -- the MBS analyst is -- provides information to an OQ position but itself is not an OQ position.

MR. PIERZINA: Thanks. I --

MR. KNUDSON: Yeah, we're information providers. We're not decision makers. We make decisions on our own software but we don't make decisions on any type of operational issues.

MR. PIERZINA: All right. Thanks. That's all I have.

MR. NICHOLSON: Ravi?

MR. CHHATRE: Yep.

BY MR. CHHATRE:

Q. Let me go back to the statistics, I guess. You said you had roughly three to seven calls that you guys get in two shifts. The number you gave me, 80 to 100 --

MR. BARLOW: Oh, the number, okay this is Rick speaking --

MR. CHHATRE: -- 100 to 250 --

MR. BARLOW: -- (indiscernible) --
MR. CHHATRE: -- for the month on two shifts.
MR. BARLOW: Yes.
MR. CHHATRE: So three to seven calls per 24-hour shift.
MR. BARLOW: Yes.
MR. CHHATRE: So like one to -- or two to four calls per person --
MR. BARLOW: Yes.
MR. CHHATRE: -- per shift. And of those you mentioned they're all kinds of calls, not necessarily column separation or mass balance.
MR. BARLOW: Yeah, any call that comes to the --
MR. CHHATRE: So how many of these two to four calls per person per shift are mass balance?
MR. BARLOW: We do keep statistics and could see -- our imbalance alarms in which they get called on. I don't know the statistics offhand but -- yeah.
MR. JOHNSON: Why don't we make that an IR request --
MR. BARLOW: Yes.
MR. CHHATRE: Do you want to?
MR. JOHNSON: Okay.
MR. BARLOW: Yeah, we could do that.
MR. JOHNSON: I mean if that's what you want to do. That's something that -- then we could focus.
MR. CHHATRE: (Indiscernible) useful for me or not so if

it's useful to you --

MR. NICHOLSON: (Indiscernible) write that down.

MR. JOHNSON: -- (indiscernible) on the record.

BY MR. CHHATRE:

Q. Since you don't have statistics let me ask you this. When you were an analyst --

A. Yes.

Q. -- do you recall how many particularly you got, not the average, but can you give me a high and low like some day I got zero, other days I got four or something like that, like a bracket --

A. It's really --

Q. -- or that this was mass balance?

A. -- it's really hard to compare one day to the next because --

Q. Oh, no I'm not asking for one day to -- I'm just saying the lowest number you got on any given period like one month you can look at and the highest I got. I'm just looking for the bracket, not average.

A. Okay.

Q. For mass balance.

A. In the month of July probably maybe one or two calls in a shift.

Q. Now, how you guys treat an analyst the column separation of mass balance type consideration, calls, whatever you want to

call it? Is that pretty serious, moderate or (indiscernible)?

A. It's serious in that her model is unreliable and we strive to ensure that our model is reliable at all times.

Q. So with that frame do you dig little more deeply into looking at why there was a column separation or how would that impact your model or what causes that?

A. I'm not sure what you mean by dig.

Q. This column separation in itself is a product of a model. There is no different pressure sensor that's giving --

A. Right.

Q. -- you that. It's your model that's telling you that it is a different pressure.

A. Right.

Q. And so there's the column separation. So when you get a call for that do you go back and actually check and see if the model is giving you the correct information because column separation is a serious matter?

A. Yes. I said that earlier that through the process that we use where you go into the flow and to the pressure as you navigate through that you would be checking the posted pressures upstream and downstream.

Q. So you do that.

A. Yes.

Q. So nobody has to ask you that. You do that on your own because you want to check the model. Is that correct or that is

not correct?

A. Well, we use it, like I said, if we use -- the pressures and flow that we would be looking at would be relating to the function of the MBS. It's not relating to the function of leak detection for the control center.

Q. Right. But you do look at that --

A. I just want to clarify that.

Q. Okay. But (indiscernible) --

A. Yes.

Q. -- the reason is you do look at it.

A. Yes.

Q. You do look at it (indiscernible) --

A. This is something that -- this is something that I did at the time when I received the five-minute, 20-minute and two-hour alarm on the 1:00 startup one of the things that I did, and this is how I recognized that we had a problem at Niles, was the fact that I went through the pressure.

Q. And how did it impact -- I mean, once you know that Niles was bypassed --

A. Right.

Q. -- did you go back and look at your monitor and did you find a problem with it?

A. Actually, the reason why I went to talk to the operator was because the pressures didn't look right.

Q. Okay.

A. And that would have came from my looking at it through the pressure -- following the process and looking at the pressure trends.

Q. Now, we'll step back a little bit because you said that there was a column separation in Griffith and Marshall based on that 5:15 or 5:20 and two-hour alarms. I think that's what you said.

A. There was a column separation that existed between --

Q. Between that --

A. -- Griffith and Marshall.

Q. Correct. And my question is why you are doing so broad bracket when, typically, you're -- if I understand your model correctly it is only between the two valves or two (indiscernible) or two sensors is where your model will tell there is a column separation or am I wrong?

A. Well, we're set up on Line 6B is there's two sections. There's two sections that we look at, Griffith to Marshall and then from Marshall to Sarnia. So within the section with the valve closed at Stockbridge is contained a section between Marshall to Stockbridge but also the section from Marshall back to Griffith. So the section of the alarm that was triggered was due to the pressures being below vapor pressure on the suction side of Marshall on the startup.

Q. So then the column separation really is not between Griffith to Marshall but between Marshall onwards because that is

where your --

A. Yes. The column separation would have been -- it would have started between -- at a point between Mendon and Marshall and would've extended down to Stockbridge.

Q. Correct. That is -- in your earlier testimony and even just now you mentioned Griffith to Marshall, I'm trying to find out why you went all the way up to Griffith rather than these two locations. Is there something in --

A. Because Griffith was the source of the flow into the line. This was the injection point into the line where the flow --

MR. JOHNSON: That's more the pipeline terminology. That's the section of pipe it's in.

MR. KNUDSON: Right.

BY MR. CHHATRE:

Q. Okay. (Indiscernible) taken on the specialist information is being provided in the column separation. The operator is given the broad bracket when we actually know where the column separation is in narrow range why are you being called?

A. I think --

Q. (Indiscernible) --

A. I think it's like as -- for MBS and as an analyst we deal with regions and we deal with alarms that are associated with regions --

Q. Okay.

Al -- and I think what you're referring to, and correct me if I'm wrong, I think what you're referring to is a station-by-station check on things.

Q. I thought I was told this morning that the column separation will be identified as between the two sensors.

A. Okay. Yeah, let me --

Q. That's what I was (indiscernible) --

A. -- let me clarify that, then. The alarm would have been associated with Griffith to Marshall which is the boundary region for the meter, right. Column separation would have been related to between Mendon and Marshall.

Q. Okay.

A. If we're talking strictly from Griffith --

Q. Okay.

A. -- to Marshall suction.

Q. And so the operator knew --

A. Right. There's --

Q. -- the (indiscernible) location --

A. -- think of it as layers where --

Q. Okay.

A. -- when we deal with MBS alarms, right, it's in the form of layers, the first layer being the section that we're --

Q. Okay.

A. -- looking at, the next section being, you know, honing down to where station-to-station and then next looking at the

instrumentation within that station. So this is -- our process is a guidance through to that point where you can identify a particular instrument or identify at what point there is a possible error occurring or there is a loss.

Q. So the operator really had an information -- the narrow information where the column separation is occurring.

A. Do you mean the operator or the analyst?

Q. No, operator. You're the analyst.

A. Right.

Q. You are giving the information to somebody.

A. Yeah. I don't know what the operator had because --

Q. No. I'm asking you even the next day during your shift --

A. Of my shift.

Q. -- is what I'm referring to and the column separation was still --

A. Yes.

Q. -- between that location so the --

A. Right, upstream of Marshall to Stockbridge.

Q. So operator had that information (indiscernible) --

A. Yes.

Q. Okay.

A. Yes.

Q. And I guess he already asked the question about the shift change but, again, I'm still going back to the column

separation being a reasonably serious issue or a serious issue.

A. Right.

Q. During the -- your shift change was there any discussion at all as to what caused the column separation? Did you -- was there any information exchanged more than just saying there was a column separation and it got cleared? Anything beyond that?

A. No because we were quite satisfied that the control center had verified that what we observed in MBS was an existing condition on the pipeline and it would -- because the column separation would have caused the model to be unreliable that information would've been passed on to the shift lead and it was that the analyst passed that to the shift lead and they would have taken it further.

Q. And how do -- you said the operators verified that it was column separation (indiscernible) how will the operator know it's verified? I mean, how did he reach the conclusion that operator had verified that there was a column separation? That's what I'm trying to understand.

A. Are you talking about when I was on shift because I really can't answer for what --

Q. I understand. I'm only talking --

A. -- what was said about --

Q. -- about your shift.

A. -- Shane.

Q. I'm only talking about your shift.

A. Okay. So to me when I received the five-minute alarm I called -- I asked him, I said, "Have you got your column back together?" Said, "No." I said, "Well, we still have a column separation there." And the five-minute, 20-minute alarm were associated with that.

Q. So typically if you get a two-hour alarm you had to go through the five- and 20-minute before you reached two-hour?

A. Right. Well, it's -- I mean, there are times you can get a 20-minute alarm. It depends on the imbalance and when it crosses over the threshold whether you receive the 20-minute first or a five-minute.

Q. Okay.

A. Generally speaking a -- as the volume increases and in this case because we weren't recording any flow out of Marshall because we hadn't overcome the column separation we would have probably moved from five-minute to 20-minute because it was an accumulated volume or accumulated volume imbalance.

Q. Now if your model is not working because of column separation is it still reliable to identify column separation after that -- what I'm --

A. Yes.

Q. -- really looking to -- okay.

A. Yes. Our practice is to inform the control center that the model is unreliable and offer to monitor the pipeline until the column is -- has been integrated and verify that the model has

not become reliable. That's generally our practice.

Q. (Indiscernible) right now if you knew that there was a column separation in the line --

A. Right.

Q. -- and your model now no longer is valid --

A. Right.

Q. -- or has limitations --

A. Right.

Q. -- then next day on your shift --

A. Right.

Q. -- the first column separation happened on somebody else's shift.

A. Yes.

Q. The five-, 20- and two-hour happened on your shift.

A. Right.

Q. And I'm not understanding your model. Is your column separation conclusion, analysis, whatever you want to call it, is reliable because you said your model is unreliable now after the first column separation so how do you arrive what is your second conclusion of five-, 20- and two-hour column separation?

A. Well, for one thing column separations existed from the point -- the column separation had existed from 5:00 in the morning and at 5:00 in the morning the Stockbridge delivery started. The column separations existed between Stockbridge and --

MR. NICHOLSON: Well, to clarify at 5:00 in the morning, which day are we --

MR. KNUDSON: Well, this would have been on the previous -- on the -- this would have been on the 25th.

MR. NICHOLSON: Okay. Not a.m. on Sunday.

MR. KNUDSON: Right. Which is was the start of the Stockbridge delivery at which time they closed the valve at Stockbridge and they were no longer flowing into Sarnia. Now, that's when those column separations would have occurred downstream of Stockbridge.

MR. NICHOLSON: There were four --

MR. KNUDSON: Right.

MR. NICHOLSON: Okay.

MR. PIERZINA: And no MBS alarm associated with those. Correct?

MR. KNUDSON: I'm not sure whether there was associated with them. I wouldn't be surprised if there was but I don't remember whether there was or not.

BY MR. CHHATRE:

Q. So from that point on the model has limitations.

A. Yes. The model is unreliable until they close the --

Q. Correct.

A. -- Stockbridge valve.

Q. And so I guess my question I'm not understanding your model is on your shift and --

A. Yes.

Q. -- again, your software is the one that going to tell you there is a column separation. There is no vapor pressure transducer, per se.

A. Well --

Q. Am I right?

A. -- the control -- we look at the model and we see it's below vapor pressure and we determine that it's column separation which we then try to verify with the control center --

Q. Understand but now that after the first column separation you model is not reliable.

A. It's --

Q. So how can you -- then your next conclusion of, five-, 20-, two-hours --

A. Right.

Q. How can you reach that conclusion when you know your model now is not reliable?

A. I'm not sure what you meant by conclusion.

Q. So you said -- I mean the first day there's a column separation on (indiscernible).

A. Yes.

Q. From that time, from time zero the model had become invalid.

A. Right.

Q. Now, next day during your shift --

A. Not invalid, unreliable.

Q. Right so (indiscernible) now you are identifying as column separation before that five-, 20- and two-hour.

A. You mean on my shift?

Q. Correct.

A. Okay. On my shift is that I know that where I have pressure, right, I can observe the changes in pressure. I can observe the transformation of energy to flow. I can see this on the model, right, and if I receive an alarm that's associated with it I can navigate through our process and determine where the likely problem exists. Now, in my case when we started back up there were diagnostic flows which trigged, which Ted walked you through explaining how they triggered the imbalances. There were diagnostic flows that were associated with Niles. That's the point where I engaged the operator to find out what was the reason behind Niles. After I talked to the operator he told me they were starting up bypassing Niles which is information I didn't have before the startup. I went back to the desk and I took the actions that I needed in order to correct the problem at Niles. Now, during the course of doing that they shut down the pipeline and returned to a static state with an existing column separation that existed before they even started up.

Q. I'm going to leave it at that. I still don't understand. If you model is not working and the next day you're using the same model to identify column separation I have a

disconnect. I don't understand that.

MR. KNUDSON: Do you want to take this, Rick?

MR. BARLOW: Yeah. I'm sorry, Rick speaking. It's not the -- the model is actually working to model column separation. It's built to model column separation correctly. So the model is working hydraulically correctly. It identifies column separation. It's unreliable for leak detection but the model itself is considered, it's built to look for column separation. It's designed for that. It's just the leak detection capabilities are not reliable because of the column separation.

MR. CHHATRE: Okay.

MR. BARLOW: Does that --

MR. CHHATRE: Yeah.

MR. BARLOW: Yeah, okay.

MR. CHHATRE: That's it.

(Pause.)

MR. CHHATRE: And that's all I have. Thank you very much.

MR. KNUDSON: Okay. Thank you.

MR. NICHOLSON: Okay. I'm going to beat this horse some more.

(Laughter.)

UNIDENTIFIED SPEAKER: Oh, my God.

MR. CHHATRE: Hey, that is good, you know. That's (indiscernible) I have.

BY MR. NICHOLSON:

Q. I am sorry. I will apologize but I want to be sure I understand this. I'm going back to your transcript, now, Jim.

A. Okay.

Q. Because I'm sort of building an understanding, maybe, as we go along. And early on in your transcript it's on page 11 --

A. Okay.

Q. -- and it's just after you said you overheard the operator, the 6B operator talking about expecting col seps on startup and you pulled up -- you said you pulled up what's called a distance -- I think it's the distance plot, they put blot in the transcript.

A. Okay.

Q. I think that's distance plot and you say to see the number of liquid fractions that were in section of Line 6B.

A. Right and --

Q. I thought earlier you said you hadn't looked at the liquid fraction screen, only the hydraulic profiles.

A. That's just a term that I use, not a screen that I used and what I was referring to was the number -- was the point at where I could see on the distance plot which is considered -- is our flow display -- it's a point where I could see the head sufficiently close to elevation --

Q. Okay.

A. -- to determine that it was in liquid fraction.

Q. So you did not go to the liquid fraction --
A. No, this is --
Q. -- screen?
A. -- just -- this refers to --
Q. All right.
A. -- me referring to the column separation as --
Q. Okay.
A. -- being a liquid fraction.
Q. So -- and then you go on to say there were probably four or five evidence of liquid fraction.
A. Right.
Q. But those were all downstream -- those were all at Stockbridge.
A. Yes. And --
Q. Okay.
A. -- one at Marshall --
Q. So --
A. -- as well.
Q. And there was one at Marshall so that's where I'm going with this. So the -- on the shutdown the mass balance alarm that occurred on shutdown --
A. Right.
Q. -- resulted in col seps but the mass balance alarm cleared itself.
A. Yes.

Q. If I had gone to a liquid fraction screen the following morning would I still see col sep or would I see a liquid fraction still on the liquid fraction display?

A. Yes because liquid fraction shows you the ratio of liquid and gas.

Q. So it won't clear.

A. It won't clear.

Q. Okay. It'll still be there.

A. Right.

Q. Okay. But you would have had to go further back in time to have seen that when you pulled things up.

A. Right.

Q. Okay. So were you aware of it or not?

A. Was I aware of --

Q. The Marshall --

A. Yes, because I reviewed Shane's write up on it and I knew that the operator verified that the column sep occurred on the shutdown and he referred to it as drained up into Stockbridge.

Q. Okay. So if you knew the ones were there at Marshall you didn't seek to find out why they were there? You didn't try to explain the col sep.

A. No because we engage at the request of the control center or at the existence of an MBS alarm and in this case I was not engaged by the control center until the time that the five-minute alarm occurred on startup.

Q. But even then -- even on those alarms you didn't try and seek the actual source of the col sep.

A. Well, at the time I was a little bit busy trying to fix the problem at Niles.

Q. At Niles. That was your focus on that first --

A. Right. My focus --

Q. -- with Niles.

A. -- on the startup was on dealing with trying to get the pressure differential correct across Niles.

Q. Okay. I've asked this of a couple people, I think, but on your shift what do you think failed? Was it the procedure or people? What failed in identifying this as a leak?

A. On my shift. I don't think anything failed. I think we did exactly what we were supposed to do. We tried --

Q. Per procedure.

A. Yeah.

Q. Okay.

A. As far as where my relationship with the shift leads and with my position I think we did exactly what we were supposed to do.

Q. Okay.

A. Now, we -- they tried to start up the line. I recognized a problem at Niles. I took the steps that were required in my position to try and minimize the diagnostic flows created by that so that we could properly observe the integration

of the column.

Q. Um-hum.

A. The line was shut down. I was requested at that time from the control center to review things. I reviewed it, recognized that we had produced 280 pounds of discharge out of Mendon. We required 320 pounds which was a shortage of 40 pounds which is what is associated with where the column separation was observed above stream of Marshall.

Q. So what, then, if the procedures are good what needs to be added to the procedures to get someone looking at trends further back?

A. I don't -- you know, as far as -- I'm not in the MBS analyst position any longer but I didn't see anything that was in our process or in our procedures that needed to be altered, that we did what -- we did exactly what we were supposed to do. We recognized that there was a column separation. We relayed that information to the control center. We identified that the model was unreliable. That is the context of our information. That is the information provided to the control center.

Q. But who needs to go back and find the source of the col sep? Who needs to identify whether it's -- the source of the col sep is a leak or elevation change or poor shutdown? Where does that need to fall?

A. Somebody well above my pay grade.

Q. So it's not the MBS analyst.

A. It's not the MBS analyst that's going --
Q. Okay.
A. -- to come with an answer for this. I mean, you know, like I'm a former operator --
Q. Who's the qualified individual to make that assessment at Enbridge? The shift lead?
A. Who's the qualified person?
Q. Sure.
A. I would say somebody within the control center --
Q. Okay.
A. -- who handles how they operate the pipelines.
Q. They should be tracking down col sep -- the source of the col sep.
A. You mean who should be -- you asked me who should be responsible --
Q. Who should take column separation and figure and explain it? Whose job is that?
A. Explain it how it's caused? How it exists?
Q. Cause. How it exists?
A. I think we, as MBS analysts as part of the orientation to the new operators, have taken and explained that to them but that's --
Q. I mean, at the time of alarm and the existence of col seps.
A. Oh, at the time of an alarm?

Q. Yeah, I mean it's got to get resolved, right?

MR. BARLOW: Your -- Rick speaking. Jim, we don't explain column separations when we do alarm analysis.

MR. KNUDSON: No, we don't.

MR. BARLOW: We identify column --

MR. KNUDSON: We identify --

MR. BARLOW: -- separations went on but we don't explain why they're there. We just identify that they are there in the model.

BY MR. NICHOLSON:

Q. And that's what I'm getting at.

A. Okay. Sorry. I thought you meant who's -- I mean, overall who explains, you know, what causes column separation the whole --

Q. No. No. No. That's like a training --

A. Right. That's what I thought you were referring to.

Q. Just as Rick said there, who is supposed to chase down that col sep.

A. We don't have the necessary --

Q. -- 5:30 calls --

A. -- tools. We don't have the --

MR. JOHNSON: I think the answer probably should go to a shift lead.

MR. KNUDSON: Yes.

MR. JOHNSON: I think, this is Jay speaking --

MR. NICHOLSON: The answer --

MR. JOHNSON: The --

MR. NICHOLSON: -- (indiscernible) --

MR. JOHNSON: -- what Jim has said is it's not in their responsibilities so it's not, also, in his responsibility to say who should be doing it. If someone comes to Jim and asks for more information I think that's what --

MR. NICHOLSON: Well, Jim could have --

MR. JOHNSON: -- I think that you're looking for.

MR. NICHOLSON: -- said procedures says the shift lead (indiscernible). Right?

MR. JOHNSON: That's not his procedures. He's got an MBS --

MR. NICHOLSON: Okay.

MR. JOHNSON: -- analyst procedure.

MR. NICHOLSON: Okay.

BY MR. NICHOLSON:

A. Yeah, we don't follow the CCO procedures. They have their own set of procedures. We follow our process and our procedures which tells us what you are supposed to do in light of a column separation and at the time the existing procedure, as I recall it, was to pass on to the shift lead that the model was unreliable and offer to monitor, you know, further until the point at where the model would become reliable again.

Q. Okay. But if it's not you, and it seems like as the day

progressed and we got into second shift on Monday, eventually Ted is -- he's also in the MBS group -- he went and actually looked for the source of col sep. He seemed to go that one step further. Right?

A. Right.

Q. So I guess since he's in your group I would -- that's why I'm asking you, is that not something an analyst would normally seek to explain?

A. Yeah, I think we mentioned this before.

Q. Okay.

A. How write ups are done by the MBS analyst --

Q. Right.

A. -- and follow ups are done by the line custodians so --

Q. Okay.

A. -- in the context of Ted being the line custodian for Line 6 this would have been him reviewing an MBS event and following up on it.

Q. Okay.

A. Which is kind of like -- it's part and parcel of how we train our analysts and how we continue the training of our analysts in having someone like Ted review this and pass this --

Q. So root cause --

A. -- pass it on.

Q. -- for a col sep would have to go up to the custodians.

A. Right. Generally, root cause analysis is usually

performed by line custodians or by any one of our senior members --

Q. Okay.

A. -- within Pipeline Modeling.

Q. Okay. I'm curious about the -- between the first and second startups on the line looked like they exceeded the ten-minute rule that I've seen in procedures and heard a lot about. Were you aware of that?

A. No. I don't --

Q. You weren't in on that part.

A. -- I don't have any part of ten-minute rule. The only ten-minute thing --

Q. Well, it's written in the MBS alarm.

A. That's written in their procedure. Not in ours.

Q. So you guys don't --

A. We don't follow their procedure.

Q. -- you don't try and get your analysis back to the operator within ten minutes?

A. We have ten minutes -- we have ten minutes to come to a conclusion.

Q. Um-hum. So you're aware that you have --

A. Right. We're aware that their procedure says that we have ten minutes to respond.

Q. Okay.

A. In the context of ten minutes the analyst will determine

within the first few minutes whether he's able to handle the call and engage support. Now, in terms of ten minutes they will receive an alarm that says the MBS alarm has been active for ten minutes --

Q. Okay.

A. -- which is their signal that ten minutes has passed.

Q. Yes, I've seen that. That's right.

A. But we don't actively monitor that.

Q. Okay. You're really not involved at all.

A. I'm not involved in that whatsoever.

Q. Okay. But you know what the procedure says.

A. Well, I mean you have ten minutes to respond.

Q. Yeah. Okay.

A. You hear the clock ticking. I mean, we try -- you try to give an answer back to the control center as quickly and proficiently as you can.

MR. NICHOLSON: Okay. All right. Karen, if you have any --

MS. BUTLER: I do.

MR. NICHOLSON: -- follow ups?

MS. BUTLER: Sorry. Are you finished?

MR. NICHOLSON: I am. I'm done for now.

BY MS. BUTLER:

Q. On the column separation I believe that there was one point at which we discussed what were plausible causes for that

and one of the statements was, well, you could have a bad transmitter. Is that correct?

A. That's kind of --

MR. PIERZINA: No, I believe that was an MBS alarm. You could have an MBS alarm because of a bad transmitter.

BY MS. BUTLER:

Q. Okay. So --

MR. BARLOW: Yes.

BY MS. BUTLER:

Q. -- so basically, when you look into an MBS alarm, right, because that's what the shift lead calls you on, right?

A. Yes.

Q. They call you based on an MBS alarm and then you've got to do some diagnosis. So the diagnosis there for if it's a column separation that's -- that can also be a similar alarm based on a bad transmitter, right?

A. Yes but we don't do diagnosis we do analysis and we --

Q. Okay. You call it what you want --

A. Well, we analyze the software which is a distinction between diagnoses because a diagnosis refers to maybe finding a root cause which is not the MBS analyst's job.

Q. Okay. I think I've got that.

A. Okay.

Q. So I think I comprehend that you are not to get to root cause. Okay. So on the ten-minute call you were actually on one

of those phone calls, right Jim?

A. With the operator?

Q. I believe with one of the supervisors and the shift lead.

A. On a ten-minute -- I'm not quite sure what you mean, Karen.

Q. They were getting ready to restart, I believe, for the second time. Were you not on that call?

A. I was on a call. I was asked by Darin to provide MBS information to Blaine and that was a call that I was on and it actually was over a speakerphone and I was -- sat at over at the shift lead's console after I was requested to partake in the conversation.

Q. Yeah so they, very clearly, in that conversation discussed the ten-minute element. That was in part of the transcript.

A. I'm sorry I can't answer that, Karen. I have never had a chance to review the transcript.

Q. Okay. So your memory just doesn't remember the ten-minute discussion.

A. Well, this was three months ago. I'm 56 --

Q. Okay. That's fine. That's fine. So I just wanted to make sure that you were exposed to the ten-minute rule at least as an operator. Correct? Previously?

A. The ten-minute rule is something that has different

connotations. So like, when you say ten-minute rule I have to really think, in my mind, what exactly do you mean by ten-minute rule? Because ten-minute rule might mean column separation. Ten-minute rule might be in how long it takes for an MBS analyst to respond to an MBS alarm. I'm -- you know, like you toss ten-minute rule around like it's something that covers many things and I'm not really sure what exactly you're asking me.

Q. Okay. That's fair.

MR. JOHNSON: And this -- and from --

MS. BUTLER: Our understanding --

MR. JOHNSON: -- Jay's standpoint let's direct the questions to Jim's position, not former a position.

MS. BUTLER: I was doing that to lead into something else. Thank you, Jay.

MR. NICHOLSON: Well, hold on.

MS. BUTLER: I will question as I need to.

MR. NICHOLSON: Is that what she's doing?

BY MS. BUTLER:

Q. So based on the ten-minute call what I was getting at is that it's our understanding that you were at least part on the conversation on the second restart. Is that correct?

A. Yes, I was part of the conversation.

Q. Okay. So the ten-minute rule, obviously, has different meanings to different people and we'll just accept that on the record because that's been very vague to us, as well. But we've

begin to discover, right, that the ten-minute rule means that you're supposed to be able to meet -- anticipate the pressures within ten minutes or shut down. Okay. That's one application.

A. Well, here again, Karen, you're asking me to make an opinion or make a decision on something I'm not -- I'm not a pipeline operator.

Q. I didn't even ask --

A. I'm an MBS analyst.

Q. -- a question there.

A. Well, you're referring to what did I think about the ten-minute rule.

Q. I was getting ready for the next part which is the second part of the ten-minute rule is, from our understanding, is that you, as an analyst, would have ten minutes to look at the situation and diagnose that if you're requested to by the shift lead and then get back to the shift lead. Correct?

A. Yes.

Q. Okay. So the second part of the ten-minute rule is what would be applicable to the analyst while it's based on the needs of the operational control center. Okay. So moving on from that, of the times that you have taken a request to respond to an alarm the shift leads call you and sometimes the operators call you. Is that correct?

A. Yes.

Q. Okay. So if you were to look over your history can you

tell me whether the number of times it comes from a shift lead is more or less than from an operator in an estimated fashion?

A. I think probably rather than answer that and guess at it, this is actually recordable information that you can probably obtain from the MBS events.

Q. Okay. That's great. All right. So from your history and understanding of having been in the analyst role for about three years, you don't have a feeling as to whether you've been called more times by a shift lead or an operator.

A. I would say, from the top of my head, I probably have been called a lot more times by the shift lead.

Q. All right. Do you think that the operators look at you as an expert in leak detection based on how they relate to you?

A. No, I think the operators look at me as an expert in MBS analysis.

Q. Okay. All right. And so the MS system analyst serves the leak detection system, in your mind, or is it one and the same?

A. No, the MBS utility that we use is a form of a leak trigger that's available to the operator and it's part of many other types of activities that are surrounded with leak detection.

Q. Okay. All right. So your -- you've mentioned previously today that one of the things you do is determine, upon being asked, that the model is either unreliable or reliable. Is that correct?

A. That's correct.

Q. Okay. So when a model is unreliable and we are in a conversation like we were with Blaine and Darin and the topic of false alarms comes up is the subject of that such that the model was unreliable and thereby produced false alarms or is false alarms something separate?

A. I believe what was passed on was that the model is unreliable and that we offered to monitor it on startup and that at the time of the conversation there were no alarms present, that the alarms had cleared.

Q. Okay. I believe in that recording there are a mention of false alarms.

A. It wouldn't have been by me.

Q. Okay. All right.

MR. NICHOLSON: Well, I've got the transcripts here. Do we want to --

MS. BUTLER: That'd be great if you have them.

MR. NICHOLSON: It's a rather long conversation but --

MR. JOHNSON: Do we want to get into that without Jim having a chance to review them first?

MS. BUTLER: Actually, you know it's, you know --

MR. NICHOLSON: Well, I've highlighted it and I can hand it to him.

MS. BUTLER: No, we don't have to unless Matt needs an answer.

MR. NICHOLSON: Well, we've got -- it's here in the transcript so --

MR. CHHATRE: (Indiscernible.)

MR. NICHOLSON: It's useful. So what was your question, Karen?

MS. BUTLER: It was whether or not the topic of false alarms was brought up in that ten-minute call?

MR. NICHOLSON: Well, I don't know why --

MR. JOHNSON: So do the calls have the names to them?

MR. NICHOLSON: Yes.

MR. JOHNSON: They do?

MR. NICHOLSON: Yes. I mean here's a line with Jim's --

MR. KNUDSON: Okay.

BY MR. NICHOLSON:

Q. -- name (indiscernible) false alarm. I think that's what's she's referring to.

A. Here's the preceding page. Okay.

Q. There are two pages besides.

A. Okay.

(Pause.)

A. Yes. Okay. I can clarify that for you.

Q. Okay.

A. Darin had the procedure out and he was reading it off to Blaine and within the procedure, which I was looking at on a PC screen which was right there, the calls valid alarm, invalid

alarm, false alarm, right? It's classified in there, if you remember, looking at their procedure --

Q. I've got it here.

A. -- the call center.

Q. Are there three choices or just two? I thought there was two.

A. Well, I'm not sure. Like --

Q. Okay.

A. -- exactly I haven't looked at it since I was an operator --

Q. Okay.

A. -- but -- or looked at it that night but that's what I would have been referring to as a false alarm. I wouldn't have been referring to a false alarm as it related to the MBS. I was referring to the false alarm as it related to their procedure and how they identified how their -- what their procedure should be. And it was in the context of, you know, of being in the conversation with Darin over what they were doing.

MR. NICHOLSON: Does that answer your question?

MS. BUTLER: I don't believe so.

BY MS. BUTLER:

Q. So the false -- can you read back Jim's statement that includes the false alarm element?

A. Okay. Read back to where Darin actually is talking about the procedure.

Q. Okay.

A. And follow it through from there and you can see that my statement relates to what Darin said previous to that. And he's reading off to Blaine what the actual procedure is.

Q. Right.

A. And he's trying to explain to Blaine what the procedure -- what's written in the procedure. Now, you have to remember Blaine's sitting at home.

Q. Right. Right. And then, okay, so at that particular point in time then you say what?

A. I refer to it as a false alarm in the context of what the actual CCO procedure was saying.

Q. Okay. And when we call it a false alarm in regards to that procedure, Matt, you have that procedure. Correct?

MR. NICHOLSON: Yes.

MS. BUTLER: Can you read to me what that is?

MR. NICHOLSON: Well, yeah, I'm going to get it now.

MR. JOHNSON: Well, would that be applicable, though, to Jim because he doesn't follow CCO procedures?

MS. BUTLER: I believe it would.

MR. NICHOLSON: Let's just go through it. I think -- let's just discuss it while we have Jim here, recognizing that Jim is not an operator. Jim is our mass balance analyst. How about we do that?

MS. BUTLER: That's fine. I'll make sure I keep

clarifying that.

MR. NICHOLSON: You'll clarify that. And really -- and I will say that transcript does pretty much read verbatim from this leak alarm.

MS. BUTLER: Right.

MR. NICHOLSON: So what was it I was going to read?

MS. BUTLER: False alarm.

MR. NICHOLSON: So it's a temporary alarm procedure, I think, is what they do.

MR. KNUDSON: Right.

MR. NICHOLSON: They go to a temporary alarm procedure. It's not technically titled false alarm.

MR. KNUDSON: But it's referred to by them as false alarm.

MR. NICHOLSON: Yeah, they might have done that but if you go to temporary alarm under their procedures they are to continue normal operations, no pipeline shutdown is required or if the pipeline was shut down, resume normal operations.

BY MS. BUTLER:

Q. Okay. And we got to the -- Jim, we got to the temporary alarm procedure either directed by the shift lead or was that the result of an analysis that you provided back?

A. The analysis I would have provided back would have been that the model was unreliable and that there was a column separation at Marshall and from that point they would've engaged

their procedure. And now in the conversation with Blaine and with Darin, Darin was reading off the procedures and I think my answering saying false alarm was just a method to clarify it to Blaine.

MR. NICHOLSON: So the procedure that Darin reads is called, MBS Leak Alarm Analysis by MBS Support. And what they did is they get down to the lower portion -- the lower half of this and it says, "If MBS support advises the alarm is valid execute valid alarm procedure."

MS. BUTLER: Okay. So --

MR. NICHOLSON: "If MBS support advises the alarm is false, execute the temporary alarm procedure," at which point Blaine asks Jim, I believe, "What is your call? Is it a valid or… --"

MR. KNUDSON: Right.

MR. NICHOLSON: -- "…false?"

BY MS. BUTLER:

A. And my call was false alarm as far as their procedure stated.

Q. Okay. So it was false alarm and then that moved us into the temporary procedure.

MR. NICHOLSON: Yes.

BY MS. BUTLER:

Q. Okay. All right. So do you recall on your shift how many --

BY MR. CHHATRE:

Q. Before you go, Karen, I want to find out why it was identified as false alarm?

A. Because it wasn't a valid alarm.

Q. Okay. But the question I guess (indiscernible) earlier that Karen asked was once your system is not supposed to be reliable and Karen asked the question because the system didn't -- because it's not reliable did the system create the alarm or the alarm should become unreliable because the system (indiscernible)? And I don't think I got a clear understanding of that answer.

MR. KNUDSON: Well, you handle this one.

MR. BARLOW: Yeah, Rick here. Yeah. I'll see if I can explain it and there is different terminology and that what makes it a little bit difficult for us. As we've mentioned before we don't use the terms valid alarm. We don't' use the terms false alarm. We just -- we explain -- and I think this is where they consider -- well, and I don't want to spec -- yeah --

MR. JOHNSON: Don't speculate.

MR. BARLOW: -- I have to be careful here. Yes, no speculation. We explain -- we can explain if there -- if we can see an explanation for an alarm then we may say that it's an explainable alarm because of these reasons here. If it's not explainable that means that the system has actually worked and it seems -- the system seems to be working correctly. We have an alarm. There's no explanation for it. Column separation could be

an explanation for why we're having the alarm. Other things could be an explanation, as well. So we'll say that the system is working correctly. We have an imbalance alarm. We can't explain why we're having that alarm, therefore, there's an imbalance, an unexplainable imbalance on the system and that's what we pass to them and I believe they would call that a valid alarm. If it's an unexplainable alarm we can't explain what the reason is, the system is working correctly, something is going on that we can't explain for any particular reasons, I think that's what translates into a valid alarm, therefore, they consider, okay, the MBS is a trigger and we're going to be doing our particular things. But if we explain it then I think it goes into their idea of a temporary alarm.

BY MR. CHHATRE:

Q. So what is your terminology for explainable alarms and non-explainable alarms? I understand the terminology is different but what is your terminology?

A. Ours is the model is working correctly or the model is not working correctly.

MR. BARLOW: Yeah, we can't see any reason why this alarm is occurring. We haven't been able to identify any issues whether it's a column separation, instrumentation, a obvious modeling problem that we can see, whether or not there's a communications outage that is called the -- like, so none of those things. We've been through all of that. We can't see any reason

for the alarm, therefore, at this point we say it's an unexplained alarm that the if we can't explain it --

MR. CHHATRE: Okay.

MR. BARLOW: -- then it's an unexplained alarm.

MR. CHHATRE: But I guess going back to Jim, again --

MR. BARLOW: Yeah, I'm sorry.

MR. CHHATRE: If the system is unreliable then the alarms you are getting -- if the system creating the alarm because the system is unreliable --

MR. BARLOW: No. No. No. It's --

MR. KNUDSON: The condition --

MR. CHHATRE: -- (indiscernible) --

MR. BARLOW: No. It's explainable. It's unreliable because of the column separation that makes it -- that we've explained it. The column separation is we -- is the explanation for the alarm and the system is unreliable.

MR. CHHATRE: Right. So the next alarm I'm getting --

MR. BARLOW: Um-hum.

MR. CHHATRE: -- is it because the system now is generating alarms because the system is unreliable now or the alarms I'm getting you're analyzing as column separation? I'm trying to find (indiscernible). Once you identify system being unreliable, how reliable the next alarms are?

MR. BARLOW: If it's --

MR. CHHATRE: To begin with (indiscernible) alarm.

MR. BARLOW: Yeah, if there's -- if the -- the unreliability basically refers to the column separation condition that --

MR. CHHATRE: Only. So your system is unreliable only for the column separation. Is that correct?

MR. BARLOW: That's basically -- that's the -- that's where it's unreliable because of column separation. The other --

MR. CHHATRE: Not because -- I'm saying I think --

MR. BARLOW: Yes.

MR. CHHATRE: -- the statement made was that once you have column separation --

MR. BARLOW: This -- the model is unreliable --

MR. CHHATRE: -- system (indiscernible) -- the model is unreliable --

MR. BARLOW: That's right.

MR. CHHATRE: Now, my next question is --

MR. BARLOW: That's right.

MR. CHHATRE: -- one step at a time, now that the system is unreliable --

MR. BARLOW: Yes.

MR. CHHATRE: -- any alarms I'm getting now are caused or can be caused because by the system which is now unreliable or I'm getting alarms that the system can't explain anymore because the system is unreliable. I understand (indiscernible) difference. It's big difference. Once I'm getting

(indiscernible) the system now is completely wacko, unreliable, whatever you call it.

MR. KNUDSON: Well, I think --

MR. CHHATRE: And has a study been done to --

MR. BARLOW: Yeah. I think --

MR. CHHATRE: -- (indiscernible) that?

MR. BARLOW: I think the only time that we use the word unreliable is if there's a column separation condition.

MR. KNUDSON: Yeah.

MR. BARLOW: We can't know the answer with a column separation condition. We can't know that the hydraulics --

MR. CHHATRE: But, yeah, I guess --

MR. BARLOW: -- no longer work.

MR. CHHATRE: -- no, I'm still wondering answer.

MR. BARLOW: Yeah.

MR. CHHATRE: I don't care why the system becomes unreliable.

MR. BARLOW: Okay.

MR. CHHATRE: Having said the system is unreliable from that point on any alarm I'm getting is it because the system generating those faulty alarms or system cannot identify the cause for the alarms? I understand why your system becomes unreliable the first time.

MR. BARLOW: Okay. Okay.

BY MR. CHHATRE:

A. I think if you look at the way that it's constructed, like, in this particular case, from Griffith to Marshall being where the flow meters were, the section that was immediately upstream of Marshall where the column is above a vapor pressure then the pressures are reliable enough for the model to model correctly, the hydraulics. But from the point where it drops below vapor pressure, that section, until it regains above vapor pressure again, is an area where it can mask the loss of volume that's going into the pipeline. For that reason it stays unreliable until such time as all pressures are above elevation because then the model can correctly calculate out the hydraulics.

Q. But that is not the question. The question in that section now -- you forget about (indiscernible) --

A. Right.

Q. -- in that section if I get alarms off of my first column separation how do you as an analyst or me as an operator know that it is not the system that generating the alarms or, now, the alarms are generated and you as the analyst cannot tell me anything about those?

A. Because we follow the same steps of going through the process where we check the pressures upstream at pressures where they are above elevation.

Q. But I think I was I was very specific.

MR. BARLOW: Yeah. Yeah.

BY MR. CHHATRE:

Q. -- I'm looking at this one small section where you have --

A. Right.

Q. -- column separation and you told me the system is unreliable now only --

A. Right.

Q. -- for that section.

MR. BARLOW: Yeah, and I think I'm not sure, Jim, that that's really what we're --

MR. KNUDSON: I'm not sure. I kind --

MR. BARLOW: Yeah.

MR. KNUDSON: -- of lost you here.

MR. BARLOW: Okay. We have volume balance regions that we did bounded by flow meters. Whenever we have a column separation within that region at that point we say that the model is unreliable and alarms generating there we don't know what the cause would be. The column separation conditions and the model is unreliable within that whole region bounded by the flow meters, right?

MR. KNUDSON: Yes.

MR. CHHATRE: Right.

MR. BARLOW: That's the -- and I'm sorry so, yeah, so --

MR. CHHATRE: My question, then, if the system is unreliable so any future alarms I'm getting in that bounded region --

MR. BARLOW: We don't know.
MR. CHHATRE: -- the system generating (indiscernible) --
MR. KNUDSON: We don't know.
MR. BARLOW: That's right. Any alarms --
MR. KNUDSON: In that region.
MR. CHHATRE: So your program has not been tuned to -- I mean, this area has never been investigated where you are generating false alarm or you cannot interpret the alarms that are being generated. Is that a correct statement or --
MR. KNUDSON: No, it isn't.
MR. BARLOW: Well, no.
MR. KNUDSON: We don't generate -- we're not generating false alarms.
MR. BARLOW: No, but I think you're --
MR. CHHATRE: When I say we -- you -- I'm talking about the program, not you personally.
MR. BARLOW: Yeah.
MR. CHHATRE: (Indiscernible) --
MR. KNUDSON: But the alarm --
MR. CHHATRE: -- understand --
MR. KNUDSON: -- the point is --
MR. JOHNSON: They said the program --
MR. KNUDSON: -- the alarms aren't false --
MR. JOHNSON: -- is unreliable --

MR. BARLOW: Yeah.

MR. JOHNSON: -- and, therefore, is not in the leak detection capabilities.

MR. BARLOW: Yeah.

MR. JOHNSON: So it has no -- no alarms after that are valid.

MR. BARLOW: Or we can't --

MR. JOHNSON: It's inoperable.

MR. BARLOW: -- we can't -- yeah, it's inoperable. We can't evaluate alarms in a leak -- in a column separation. Yes.

MR. CHHATRE: Okay. That's --

MS. BUTLER: As a --

MR. BARLOW: I'm sorry.

MS. BUTLER: And as a result of the fact that as, I believe, it was Jay that said that as a result of the unreliability of the model no alarms after that are valid then all of them are viewed to be false by procedure and, therefore, they all fall in temporary.

MR. BARLOW: Well --

MR. NICHOLSON: That's what this says.

MR. BARLOW: -- except -- other than the -- well, okay. No. No. No. No. I -- well, okay.

MR. JOHNSON: You have told him it's operable. They have to go to their --

MR. BARLOW: Yes, their procedure.

MR. JOHNSON: -- and then it's their procedures and it's out of this area of questioning. You have told the control center right now your system is operable. I think that's what we need to hear. We're going too far.

MR. CHHATRE: No. I think we're not really.

MR. JOHNSON: No because then the procedure said if it -- they've told him it's inoperable they cannot assume any alarms they get in the future are valid alarms.

MS. BUTLER: Right.

MR. JOHNSON: That answers your question.

MR. CHHATRE: No. See what I'm trying to find out if the system now is unreliable (indiscernible) clear the alarms.

MS. BUTLER: Okay. Well, if we --

MR. JOHNSON: Well, this is -- we need to move on.

MR. CHHATRE: Yeah. Okay. Move on.

MR. JOHNSON: (Indiscernible) --

MR. CHHATRE: We can move.

MR. NICHOLSON: Let's squash this.

MR. JOHNSON: Yes.

MR. CHHATRE: Move on.

MS. BUTLER: It won't be too many more.

MR. JOHNSON: Wow.

BY MS. BUTLER:

Q. So how many MBS alarms, Jim, did you have on your shift? Do you remember?

A. I think this was probably would have been the only alarms that I had were associated with Line 6. As far as calls that I received I probably received a couple of calls from some of the other lines --

Q. Okay.

A. -- that were involved with questions from the operators.

MR. NICHOLSON: And we've got all those alarms in the logs. Right?

MR. BARLOW: Yes.

BY MS. BUTLER:

Q. Right so do you remember how many alarms were on Line 6 during your shift?

A. No. I just know that I had all three categories.

Q. Okay.

A. Not the quantity of them.

Q. When you said all -- you mean five- ten- and --

A. Five -- five- yes.

Q. Twenty?

A. Five-, 20- and two-hour.

Q. Oh, okay. All right. And to your recollection were any of those anything but what would have been, by procedure for the control room, false alarms? Were any of those valid?

A. I don't quite get where you're -- what you mean there.

Q. Okay. Of all the alarms that occurred on your shift --

A. Right.

Q. -- associated with Line 6B --
A. Yes.
Q. -- when you took that information back to the shift lead --
A. Yes.
Q. -- would any of those have resulted in a what would be deemed as a valid alarm and processed differently?
A. No.
Q. Okay. All right. All right. All right. So that answers that and one second. You mentioned that you did review pressures when you were trying to figure out going through a previous request (indiscernible) and then that was how you figured out that Niles -- something was wrong with the pressure profiles at Niles. Correct?
A. Correct.
Q. Okay. And at that time did you review pressures on the entire pipeline and then pick out Niles?
A. I went all the way back to Griffith and looked at all of the pressures at each of the stations before I proceeded to talk to the operator.
Q. Okay. So when you found the Niles problem and got that under review --
A. Right.
Q. -- and did your analysis and then did whatever was required to improve the situation did you go on any farther down

the pipeline?

A. No because at that time the pipeline was shut down.

Q. So you just stopped because you thought, at that point, your pressure profiles were appropriate.

A. No. I stopped because I had no -- I didn't have any flow in order to be able to analyze anything as it was, you know, to analyze the changes in the pipeline.

Q. Okay. So when you were working on the bypass at Niles, was that the result of there having been flow so that was between the first start up try and the second shutdown?

A. It would have been on the first startup that --

Q. Okay.

A. -- I recognized the problem at Niles.

Q. Okay. And in your previous analyst position, I'm only asking where you were before, did you ever see these communication summaries or call summaries that we talked about that come out and they look at metrics for the leak detection or the MBS system excuse me, on a monthly basis?

A. The only metrics that I'm aware of in relation to MBS analysts were those that are produced by one of our analysts on a monthly basis as a form of seeing who is -- how many calls are handled by each analyst and by us as a group.

Q. Okay. Is that the only metric that you remember as to number of calls?

A. Yes, it's the only one that I'm aware of that actually

indicates the number of calls on a month-by-month basis.

Q. Is there a breakdown by the type of things after that?

A. To some degree there is.

Q. Okay. Do you recall any of that information, like, over time were there more issues associated with column separation than anything else --

A. Not --

Q. -- or --

A. -- not without having it in front of me. My recollection wouldn't be very good.

Q. All right. So if we were going to request that particular monthly summary, what would you call that?

MR. KNUDSON: What do we call -- we call it --

MR. BARLOW: Yeah, Rick speaking. Oh, yeah, we do have a monthly metrics.

MR. KNUDSON: Right.

MR. BARLOW: So we do have a monthly metrics that are produced every month and maybe that's what you're asking for.

MS. BUTLER: Yeah, what's the name of that?

MR. BARLOW: Well, I guess we call it --

MR. KNUDSON: I think it's monthly MBS --

MR. BARLOW: Monthly MBS --

MR. KNUDSON: -- alarm summary --

MR. BARLOW: Well, it's --

MR. KNUDSON: -- or event summary.

MR. BARLOW: I think it's call out metrics.

MR. JOHNSON: Just call it all metrics and then they'll take it from there.

MR. BARLOW: Yeah, there's only one that we have. It's the only one.

MS. BUTLER: Okay. All right. So if I say monthly MBS metrics that's good enough.

MR. BARLOW: Yes.

MR. KNUDSON: Yes.

BY MS. BUTLER:

Q. All right. Okay. And as far as you know, Jim, when you were an analyst how many analysts were on staff?

A. I believe at the time we had four analysts on staff.

Q. Okay. And how many of the individuals and I've forgotten all the specific terms, there's a line something how many of those did you have?

A. Line custodian. There would have been probably five line custodians.

Q. Okay. All right. In general, I believe I know the answer to this question but I want to be able to make sure that I don't put in my words. I like to put it in your words and those need to be chosen very carefully. What do you believe is the value that an MBS analyst provides to the operators or the shift leads in the control room?

A. I believe what they provide is a quick response to

identification of the validity of the leak trigger provided by the CPM.

Q. Okay. All right. And this is, to our knowledge since you've been promoted since this event, is Shane --

A. Actually, before this event.

Q. Excuse me, promoted before this event but it didn't take effect until after this event.

A. Right.

Q. Then has -- is Shane's position still as an MBS analyst, to your knowledge?

A. Yes, I believe Shane is still an MBS analyst.

Q. Okay. All right. And what would you do to prevent, in the future, a prolonged leak going from being unrecognized, period?

A. I believe that question is out of the context of my position.

Q. Okay. So --

A. I can't answer that.

Q. Okay. To paraphrase and make sure I do this correctly because I don't want to do anything wrong.

A. Okay.

Q. All right? So your viewpoint is that there's nothing that an MBS analyst could do to prevent what happened on -- in the Marshall event from going unrecognized for an extended period of time?

MR. JOHNSON: I would like you to phrase it different, please.

MS. BUTLER: It's up to you guys how you phrase it. You know, what I'm trying to get it.

MR. NICHOLSON: Do you understand the question?

MR. JOHNSON: Well, it's like is there anything you could do? Like that -- that's a broad scope. I mean Jim brings a varied experience to it.

MS. BUTLER: Right.

MR. JOHNSON: I think you would -- I myself am not comfortable with that question.

MS. BUTLER: Okay. So then --

MR. JOHNSON: And Jim -- and I'm somewhat --

MS. BUTLER: Okay.

MR. JOHNSON: -- not steering Jim. I mean, that's up to him if he wants to answer it.

BY MS. BUTLER:

Q. Okay. I think the statement that I made originally was what would an MBS analyst do, like, I meant to say like yourself not you as the specific one -- what could they do in the future to prevent a prolonged release that is a leak from going unrecognized?

A. I guess you would have to assume that they actually did something wrong in the first place and I don't believe they did.

Q. Okay.

A. I think the MBS analysts, both in the afternoon and myself, we responded the correct way to exactly the condition that existed. The control center was contacted to verify exactly what happened and we responded correctly back to them. There is absolutely nothing an MBS analyst would have done differently, be it today, be it tomorrow, be it a month from now. We would have responded back exactly the same way.

Q. Okay. So to clarify that there was nothing that I said in my statement that indicated people, as MBS analysts, had done anything wrong. What I was looking for for asking your input on wasn't that something was done wrong and could be corrected. It was meant in such a way that could something be added? Could something be changed? Could something be moved forward in a different fashion for an MBS analyst that would add them into the hazard barrier mix such that there's one more check in the system that would prevent an unrecognized release from going an extended period of time?

A. I have absolutely no idea what you're asking me. I'm sorry. I can't even think to even answer that. I don't understand what you mean or --

BY MR. NICHOLSON:

Q. Could there have been a change --

A. What kind of an answer --

Q. -- in your role -- the role of an MBS analyst that could have prevented this (indiscernible) --

A. I believe I've already answered that. I said that there was nothing wrong with anything that the MBS analysts did.

Q. Could there be a change in procedures that might address this faster?

A. That's outside of the context of what my position is. I'm not an MBS analyst specialist. I'm an MBS specialist who deals with trainers and deals with simulations, now. I'm no longer involved in the MBS analyst portion of this.

MS. BUTLER: Okay.

BY MR. NICHOLSON:

A. So you're asking me do -- what recommendation I would make on what we would change in our procedures or our process --

Q. I think it's even more about a question now that you're a trainer and you're responsible for future --

A. I know I'm sorry I'm not a trainer. I provide support for trainers. I'm not a trainer of MBS analysts.

MR. NICHOLSON: Okay.

MS. BUTLER: Okay. Let me repeat why I asked that question because maybe that'll give you some context. Okay? The reason --

MR. CHHATRE: I'd really like an answer.

BY MS. BUTLER:

Q. -- I'm asking that question is when I asked the question what is your value to the operators and shift leads in the control room in your own words? Right?

A. Yes.

Q. I think it was something like this. Of course, I was typing and it may not have been word for word, but I think it was something like to provide a quick response to identify leak triggers provided by the CPM system.

A. The validity of --

Q. Okay.

A. -- the leak triggers.

Q. Okay. So in that regard I see that as an ongoing communication mechanism to the operators and the shift leads to help identify leak triggers.

A. No. No, not at all.

Q. Okay.

A. We -- the CPM is a leak trigger that's used by the operators.

Q. I understand that.

A. And we monitor that leak trigger to ensure that the alarms that are generated are analyzed to determine the validity.

Q. Okay. So when you determine that there's a valid alarm --

MR. BARLOW: Rick here. We don't determine if there's a valid alarm.

MS. BUTLER: I think he just used that word so --

MR. KNUDSON: I said the validity -- I said the validity --

MR. BARLOW: Yeah, it's the validity of the system not --

MR. KNUDSON: -- of the leak trigger which is the CPM.

MR. BARLOW: Yes.

BY MS. BUTLER:

Q. Okay. So I'm going to repeat the statement back to you and you insert valid where it needs to be. Okay?

A. Okay.

Q. All right. And insert the word system where it needs to be if that's what it takes. Provide quick response to identify leak trigger provided by the CPM.

A. Okay. To provide the validity of the leak trigger provided by the CPM.

Q. Okay.

MR. NICHOLSON: Hey, Karen, I think we -- you got a lot more? I think we probably want to wrap this up maybe in ten minutes or so if we could.

MS. BUTLER: I think that's great because I'm really -- I think that was my last one. I was just trying to find out --

MR. NICHOLSON: Yeah, I don't want to rush you but --

MS. BUTLER: No, that's it, actually.

MR. NICHOLSON: Okay.

MS. BUTLER: My -- I was absolutely done. That was my --

MR. NICHOLSON: And I'm sure we can get Jim back if we

have to --

MS. BUTLER: -- last question was on --

MR. NICHOLSON: -- for conference --

MS. BUTLER: -- if there was anything --

MR. NICHOLSON: -- calls.

MS. BUTLER: -- that they thought could be improved or as a future enhancement or a mechanism by which the MBS analyst could help in identifying a prolonged leak that had not been responded to. That was it.

MR. NICHOLSON: Okay.

MR. JOHNSON: And we're done.

MR. NICHOLSON: And Brian, do you have anything else?

MR. PIERZINA: Just a couple -- no I'm --

(Laughter.)

MR. PIERZINA: I have no -- it's been a long, long day.

MR. NICHOLSON: Okay.

MR. CHHATRE: Okay. Just for the record, you didn't ask me. I have no questions.

MR. NICHOLSON: I was about to, actually, but you don't have any questions. Do you have anything?

UNIDENTIFIED SPEAKER: No.

MR. NICHOLSON: Okay. With that I think we'll conclude this interview. I appreciate it, Jim. Thank you.

MR. CHHATRE: Thank you very much.

MR. NICHOLSON: I know there was a lot of repeating --

UNIDENTIFIED SPEAKER: Oh, man.

MR. NICHOLSON: -- repetition.

(Whereupon, the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF: ENBRIDGE OIL SPILL
MARSHALL, MICHIGAN
Interview of: Jim Knudson

DOCKET NUMBER: DCA-10-MP-007

PLACE: Edmonton, Canada

DATE: December 16, 2010

was held according to the record, and that this is the original, complete, true and accurate transcript which has been compared to the recording accomplished at the hearing.

Beverly A. Lano
Transcriber