Date: April 15, 2019

Case: Certain Strontium-Rubidium Radioisotope Infusion Systems, and Components Thereof Including Generators

THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION

Ace-Federal Reporters, Inc.
Phone: 202-347-3700
Fax: 202-737-3638
Email: info@acefederal.com
Internet: www.acefederal.com

INTERNATIONAL TRADE COMMISSION

- - - - - - - - - - - - - - - - - - - -X

IN THE MATTER OF: : Investigation Number

CERTAIN STRONTIUM-RUBIDIUM : 337-TA-1110

RADIOISOTOPE INFUSION SYSTEMS AND :

COMPONENTS THEREOF INCLUDING :

GENERATORS :

- - - - - - - - - - - - - - - - - - - -X

HEARING - VOLUME III

April 15, 2019

Courtroom C

U.S. International Trade

Commission

500 E Street, S.W.

Washington, D.C.

The Hearing commenced, pursuant to notice of the Judge, at 9:01 a.m., before the Honorable CLARK S. CHENEY, Administrative Law Judge for the United States International Trade Commission.

is Bob Hails. I'm not sure we've been introduced on Thursday, but just for the record. We are going to call Dr. Robert Stone to the stand.

Can we have two minutes to check out the AV hookup and make sure everything is up and running.

JUDGE CHENEY: Yes. Let's go off the record for two minutes.

(Recess.)

JUDGE CHENEY: Let's go back on the public record.

Dr. Stone, please stand, raise your right hand and I'll swear you in.

Whereupon,

ROBERT THOMAS STONE,

was called as a witness, and having been duly sworn, was examined and testified as follows:

MR. HAILS: Thank you, Your Honor.

DIRECT EXAMINATION

BY MR. HAILS:

Q Good afternoon, Dr. Stone. Would you introduce yourself to the Court give them your name and tell them where you work.

A My name is Robert Thomas Stone. I'm the CEO of a company called Medical Designs Solutions, Incorporated.

Q And what does your company do?

A We do medical device development, everything ranging from feasibility studies to full-fledged design and handing over to manufacturing.

Q And how long have you been at your position?

A I formed the company in November of 2011.

Q Okay. Would you please briefly summarize your education for the Court.

A My education began with a year of premed at Pepperdine University, after which I joined the United States Navy. I had three years and eight months of formal schooling in the Navy being trained as a nuclear electronics technician, spent two years teaching nuclear engineering, and then spent time on the USS Bainbridge, after which leaving the Navy I went to Virginia Tech where I obtained a bachelor of science in electrical engineering and a master of science in electrical engineering. And then I went to Stanford University and obtained a Ph.D. in electrical engineering with a specialty in medical imaging.

Q You've touched on it a bit, but would you explain your professional experience working with radioactive materials.

A Certainly. The time in the Navy was either at a prototype for the USS Bainbridge or teaching at the prototype. We handled all forms of radioactive material. Everything from contamination to sources, to the

instrumentation that would be used in measuring and have internal sources, to transferring highly radioactive nuclear fuel.

Q That was the Navy. You do you have other experience working with radioactive materials?

A Yes. When I left the Navy and went to Virginia Tech, I managed a nuclear reactive facility where we did neutron activation analysis and other types of research in teaching students as well as maintaining an analytical laboratory.

Q Can you give us some type of ballpark how many years of experience do you have with working with radioactive materials?

A I believe it was eight years at Virginia Tech and six years in the Navy. That's about 14 years.

Q 14 years. Okay. Do you have professional experience working with medical devices?

A I do.

Q Why don't you explain that experience to the Court?

A My first experience working with medical devices was as a student at Stanford when I assisted in the design of a medication infusion system and then met two physicians where in 1983 I left Virginia Tech and joined a company called Nellcor, which was a medical device company. I've

been working with medical devices ever since.

Q What kind of devices do you have experience working on?

A Everything from noninvasive diagnostic devices to implantable therapeutic devices.

Q Okay. And do you have experience preparing prototype medical devices for market?

A Yes.

Q And, again, can you give us a for-instance with representative devices.

A Sure. One for-instance would be working with a company called Natus Medical. I took a prototype of a breath analyzer that had been developed at Stanford and converted it over into something that could measure the rate at which blood was breaking down in the baby, and that became a commercial product.

Q Okay. Are you familiar with how design processes for medical devices might be different from non-medical devices that might be released commercially in the market?

A Surely. In the United States in order to obtain approval from the FDA to put a medical device on the market, its design and development and manufacturing all are controlled by something called GMP, good manufacturing procedures. That process has evolved over the years from

basically handling only the manufacture where now it handles everything from the time the product design process begins.

Q Okay. And again in some type of ballpark range can you please tell the Court how much experience you have working on medical device design and development.

A Medical device and design development from 1983 to the present, I believe that's about 36 years.

MR. HAILS: So, Your Honor, we tender the witness as an expert in the field of medical devices and radiation protection systems.

MR. DAVIS: No objection, Your Honor.

MR. KOO: No objection, Your Honor.

JUDGE CHENEY: Without objection, Dr. Stone will be accepted as an expert in the fields offered.

BY MR. HAILS:

Q Will you please explain your role in this investigation?

A I was asked to look at the patents that are in concern here and determine whether I believe those patents were valid. I was also asked to look at the -- at the Ruby 3 product to determine if it infringed those. I was asked to look if I saw any indication, any evidence of copying in this matter.

Q Were you asked to develop opinions regarding

inventorship in this investigation?

A Yes.

Q And with respect to your invalidity opinions, were you asked to develop an opinion on obviousness issues for this investigation?

A Yes, I was.

Q And how about anticipation?

A No. Other than the Ruby 3 anticipation.

Q Let's -- did you prepare demonstrative materials to explain your opinions to the Court?

A Yes, I did.

Q Can we pull up the PowerPoint version of RDX-2.

What is this exhibit, sir?

A This is the first slide of the demonstratives that I prepared for this testimony.

Q Do you have a clicker?

A I do.

Q All right. Why don't we start and walk through, why don't you just take us through the first set of materials, please. Working?

A No.

Q We had this working. So now we are at slide two. I think we've talked on it, discussed it through other witnesses, but would you please explain to the Court what is positron emission tomography at a high level?

A Positron emission tomography at a high level is injecting a radioactive tracer into the body which emits positrons. That positron rapidly loses any excess energy it has and unites with an electron and annihilates converting the mass of the electron and the positron into energy, reducing two gamma rays which go in exactly opposite directions.

Q Okay. So we have two images. One here on the left and one here on the right. What is the animation on the left showing?

A The animation on the left is showing the radioactive tracer giving off its energy. The one on the right shows the process whereby that energy ends up ultimately being converted into an image in that the photons if emitted at the same time or exactly the same time as can be measured by the instrumentation is counted, and a line is drawn between two elements of the detector, and after a large number of those lines have been drawn, then an image can be computed using a process called back projection using the most common tracers.

Q Can we break it down a little bit. What's the blue ring shown in the image on the right?

A The blue ring is an array of detectors, typically they are crystals which emit light in a photodiode or photomultiplier, which counts those light

flashes --

Q I'm going to call it a green blob and a red blob inside of the green glob. Do you see that?

A Yes.

Q What's that?

A We have cross section of the torso, the red blob would be the constructed image of in this case cardiac tissue that's been generated as a result of those many lines being drawn.

Q We have the tracer and arrows coming out in opposite direction from the tracer. It hits the rings. And explain again how does that phenomena get turned into useful image data?

A Well, as shown here we have a line drawn across -- I'm sorry.

Q Back. Back. One more. All right.

A As shown here we have a line drawn across, and that line, when many, many of those lines are drawn, and using appropriate mathematical algorithm, in CT it's called convolution back projection, and an image of where those emissions took place in a computer.

Q Okay. And the -- I think the time frame we are going to be discussing is the mid-2000s. In the mid-2000s, what were the common PET tracers in use?

A The most common PET tracers in use in the year

2000 would have been fluorodeoxyglucose.

Q What about rubidium, was rubidium popular at the time?

A It was being used. CardioGen 82 had already been in use so Rubidium-82 was in use at that time.

Q Let's move forward, please. All right. And on slide three you have a little bullet for an infusion system. What's an infusion system?

A Just to make clear, we are not talking about the imaging system that's on the right. What we are talking about is the electromechanical fluidic system which controls the elution of the source as it goes from the saline bag through a source of radioactive material and into the patient.

Q And so what's the job of the infusion system?

A It is to safely inject the correct dose into the patient while maintaining radiation safety for the user.

Q Let's move forward please. I'm going to jump to slide six. Here you have a timeline presented. Will you please explain Bracco's development of its CardioGen system?

A Certainly. In 1989, the FDA approved the CardioGen 82 which is the device shown there in the diagram. This is a device that had manual strontium breakthrough tests still on the market today. It has no

computer interface and from 1989 to 2006, they were the sole supplier of Rubidium-82 infusion systems in the U.S. and they made no significant upgrades during that time.

Q You said it didn't have a computer interface. What kind of interface did it have?

A It had some digital logic that had included controls such as sub wheels, knobs, switches push buttons and indicators.

Q Let's kick out of the PowerPoint for a moment, please, and pull up RX-216. Do you recognize this document, sir?

A Yes.

Q What is this document?

A This is a user guide for the CardioGen 82 also known as the 510.

Q Can we pull up page 22 of this document. What is this?

A Well, as I stated we have light emitting diodes, knobs, switches, buttons, all of which are the control process that is done manually through the system.

Q And you said it was a manual strontium breakthrough test is that correct?

A Correct.

Q Let's move to page 45 of this document. So what is this document?

A This is the first page of a worksheet that describes what a user would do in order to do a strontium breakthrough test.

Q And if we can move forward two pages. Three pages. You see this chart. This is on page I think 48 of RX-216.

A I do.

Q This is the chart that, a chart similar to the one that Dr. Lewin was explaining earlier in testimony, is that correct?

A That's correct.

Q So am I correct that people are measuring activity and putting these figures in by hand to calculate strontium breakthrough in the CardioGen Model 510?

A That is correct.

Q Let's move back to the PowerPoint please. All right. Can you move forward please. 2006. What happens in 2006?

A 2006, the Klein thesis was published it's also called the University of Ottawa infusion system. They invited Bracco to participate in a request for information. Bracco showed no apparent interest.

Q Okay. Just for the record this exhibit number that's shown here is JX-51, but it has kind of evolved over time. It is now RX-1 44 page 10. Let's move forward.

Then what happens?

A In 2008, Bracco filed a patent application a figure of which is shown on the right-hand side and then in 2009, they supplemented that application to disclose an on-board dose calibrator.

Q That's slide seven of your presentation. Will you continue. We are at slide eight. Please explain what was the University of Ottawa doing at this time?

A The University of Ottawa had developed something they called the RBES system that possessed some really significantly advanced features. They had a touch screen interface they had automated the strontium breakthrough test they had three types of elutions instead of a single type that included the constant activity elution we discussed earlier in this, we, it's been discussed earlier in this proceeding. They provided the saline push to the patient maintaining more accurate, achieving more accurate doses and they had a longer generator life.

Q Let's move forward please. 2016, you talked about how Bracco was invited to participate. What about Ottawa's dealings with DraxImage?

JUDGE CHENEY: Just to clarify the record, Counsel, did you mean 2006 or 2016.

MR. HAILS: 2006. I'm sorry. Did --

JUDGE CHENEY: Please continue.

BY MR. HAILS:

Q Yes, sir. Please explain what happened in 2006.

A Well, as we said Ottawa invited several companies to have a request for information. They were looking for a partner to commercialize their prototype system. Bracco showed no interest and DraxImage ultimately won that request for information.

Q Please move forward. All right. Then what?

A 2007, Ottawa licenses the RBES technology to Jubilant DraxImage.

Q Now, here you show a picture taken from Exhibit 106. Is this the only document that you reviewed that explains the development of the University of Ottawa team?

A No. It's not.

Q Do you have a binder in front of you that contains other materials that you've reviewed?

A Yes, I do.

Q Would you pull it out, please. All right. I'd like to just check that my list of exhibits is the same as the one that you have. Does your binder include RX-80, RX-86, RX-88, RX-89, RX-90, RX-91, RX-92, RX-93, RX-97, RX-100, RX-102, RX-104, RX-105, RX-106 and 107?

A Yes.

Q All right. Thank you. You can put that aside.

Let's move forward, please. Okay. Now we are

on slide 9.

What are you showing here on this slide?

A What we are showing here is the similarity, in fact, the identical system components functionally between the University of Ottawa system that was developed first disclosed in 2005 and then Bracco's asserted patents which were filed in 2009.

Q So why don't you walk us through this. How do the components of the Ottawa system from 2005 compare to the system disclosed in Bracco's asserted patents?

A Well, they both have a saline source. They both have a pump for moving the saline. They both have a pressure sensor for monitoring the pressure in the system. They both have a generator valve which can divert flow either to the generator both systems or to a bypass line in both systems. They also have an activity counter to monitor the dose of radiation as it's being delivered. They have a patient valve which can direct the dose either to the patient or the calibrator line or divert that to the waste bottle where they both have a waste bottle and why they both have a dose calibrator it's not shown here on the Bracco system.

Q Okay.

A Sorry.

Q No. That's fine. Let's move forward please.

Slide 10. On slide 10 you have the subtitle generating rubidium eluate through the strontium rubidium generator. Can you explain?

A Both systems operate essential any in the same fashion. Saline is pumped through the generator valve out the output port of the generator through the radiation counter through the patient valve to the patient. Same path both systems.

Q I was going to ask just for the record, does the same process occur in the Bracco system?

A Functionally the same system.

Q Let's move forward please. Okay. We are at slide 11 and you have part of your title automating strontium breakthrough testing. Will you please explain how does this phenomenon occur in the two systems?

A Well, it's almost identical with regard to the fluid path in both systems with the difference -- only difference being at this far end instead of going to the patient it goes to an eluant reservoir not shown here that's in the dose calibrator where, in the case of the University of Ottawa, that dose comes -- where the calibration takes place.

Q In the University of Ottawa system eluant comes out of the generator through that pink path through the dose calibrator?

A That is correct.

Q And does that process also occur in the system disclosed in the Bracco patent?

A Yes.

Q The eluant comes out of the hot pink path into the dose calibrator; is that correct?

A That's correct.

Q Move forward please. Slide 12. You have a reference to a bypass path in your title. Please explain how this phenomenon occurs in the two systems.

A In both systems we have the opportunity to switch the flow from going through the generator to go through the bypass line. Instead. Going on to the patient. The bypass line can be flushed, so that the patient line can be flushed and any residual radioactivity can be removed.

Q Earlier in testimony we've been hearing about saline pushes. Are you familiar with that?

A Yes.

Q Is this concept related to that saline push concept?

A It is. That's how the saline push would occur.

Q All right. And does the operational, the operation of the bypass path, is that the same in both systems?

A Yes, it is.

Q Let's move forward please. We are on slide 13. Part of you're title says "diverting rubidium eluate to a waste bottle." Would you please explain how does this phenomenon occur in the two systems?

A Yes. On a daily basis whenever the generator or lines are changed, they need to be flushed. The generator needs to be flushed to remove Strontium breakthrough, so we once again pump saline through the generator valve through the generator and actually through on -- to the waste bottle. So any of that material that we don't want to eluate to a patient goes to a waste bottle.

Q So that was you describing the Ottawa design. Does that process occur in the Bracco disclosure?

A Same process occurs in the Bracco.

Q Let's move to slide 14, please. Okay.

JUDGE CHENEY: Probably a good place to take our afternoon break. Take 15 minutes. We are off the record.

(Recess.)

JUDGE CHENEY: We are back on the record in the 1110 investigation.

We are in the midst of the direct examination of Dr. Stone, Respondents' witness, here to talk about the validity of the considered patent.

Please proceed, Mr. Hails.

BY MR. HAILS:

Q I think when we broke we were referring to slide 14. Here we have a timeline referring to Jubilant. Will you please walk us through this material?

A Certainly. In 2007 Jubilant had taken a license and began working with the version 1 system that had been developed in 2004, and by 2010 they had developed a version 2 system. Then beginning in 2010 they began development of the so-called V3, which is the -- a product that's been under consideration today.

Q Let's move forward, please. All right. That's V2; is that correct?

A That is V2.

Q Move forward, please. All right. And then again walk us through the material on the V3?

A All right. On the material in the V3 in 2010 Jubilant had completed version 2 and began development on V3 by 2013 they submitted a user manual to the FDA. And then in 2015 they completed the design of the version 3. Then in 2016 the FDA approved the Ruby system that's here today.

Q Earlier you had testified that the system developed by the University of Ottawa provided several advantages over Bracco's predecessor CardioGen product. Did you remember that?

A Yes, I do.

Q Does the -- does the JDI's Ruby system employ the same advantages?

A Yes, it does.

Q Let me rattle them off just to be sure. Does the Ruby system have a touchsheen interface?

A It does.

Q Does JDI's Ruby system perform an automated strontium --

A Yes, it does.

JUDGE CHENEY: The court reporter is doing a great job, but -- let's -- both you and the witness can just breathe a little. Relax. This is fun.

MR. HAILS: Well, I'm glad.

BY MR. HAILS:

Q Does JDI's Ruby system perform constant activity elutions?

A It does.

Q Does JDI's Ruby system perform a saline push to patients?

A Yes, it does.

Q And does JDI's Ruby system have a longer generator life than the predecessor CardioGen 82?

A Yes, it does.

Q Do you mind if I refer to that CardioGen 82 as

the Model 510 to keep it distinct from for example the 1700?

A That would be fine.

Q All right. Thank you.

You have an exhibit here shown as JX-052C. Do you see that?

A Yes.

Q All right. And is this the only document that you reviewed to develop your understanding of the JDI development product?

A No.

Q All right. Will you look in front of you and see if you have a binder labeled JDI development documents. Can you pull them out.

A Yes.

Q Will you pull it out for me. Does that binder contain other documents that you reviewed to develop your understanding of the Jubilant design product?

A Yes, it does.

Q Let me ask you if those binders include the following exhibits. I have it as JX-007?

A Yes.

Q JX-013?

A Yes.

Q JX-14C?

A Yes.
Q JX-15C?
A Yes.
Q JX-22C?
A Yes.
Q JX-32C?
A Yes.
Q JX-33C?
A Yes.
Q JX-39C?
A Yes.
Q There is JX-52 on the screen.
A Yes.
Q RX-78C?
A Yes.
Q RX-143C?
A Yes.
Q RX-155?
A Yes.
Q And RX-172C?
A Yes.
Q All right. Thank you.
Can we move forward, please. So now we are on slide 15.
What is shown here on slide 15?

A On the left-hand side of the slide is the University of Ottawa's RBES system which was disclosed in the Klein thesis in 2005 and 2006. On the right-hand side is Jubilant's FDA filing that they filed in 2011 which is the same components of the diagram with a minor repositioning of one element.

Q I was going to ask. Is this how Jubilant explained its system to the FDA?

A Yes, it is.

Q And here you show an excerpt from a single exhibit, RX-31, at page 11. Is this the only document that you reviewed to developing your understanding of Jubilant's representations to the FDA?

A No.

Q Do you have a binder in front of you containing JDI FDA documents?

A I do.

Q Can you pull it out, please. Did you review the documents in the binder to develop your understanding of Jubilant's dialogue with the FDA regarding its system?

A Yes, I did.

Q Let me ask you if these exhibits are contained in that binder. RX-31?

A Yes.

Q RX-48?

A Yes.
Q RX-57?
A Yes.
Q RX-58?
A Yes.
Q RX-59C?
A Yes.
Q And RX-62C?
A Yes.
Q Move forward. Okay. Now we are on slide 16 and I think you've taken us through 2016, at least the beginning. Why don't you pick it up there. What happened, what else happened in 2016?
A Well, in 2016, the FDA approved the Ruby system. Bracco obtained the Jubilant product literature from the FDA via a Freedom of Information Act request. And they copied the Ruby features into new claims that have become the asserted patents here today.
Q Okay. Move forward, please. I want to jump ahead to slide 70 and talk about prior art. Will you advance, please. Here on slide 71 you have a title "Major Sources of Prior Art." Would you please explain -- introduce these prior art references to the Court.
A Well, first we have Bracco's own CardioGen 82, which was publicly used in 1989, a PET infusion system with

Rudidium-82. Next we have the Klein thesis published in 2006, it discloses a PET infusion system for Rubidium-82. Next, we have the Tate application filed in 2007, it discloses a PET infusion system using FDG. And then finally we have the Medrad Intego product, which was offered and sold in 2008, and it also includes -- there's a PET infusion system. Its material has been requested to be redacted, I understand.

MR. HAILS: So, Your Honor, it was produced to us under CBI so we have redacted slides here and we will ask eventually to go on to the confidential record for this third-party CBI, to discuss just so you are aware.

JUDGE CHENEY: I'm a little confused.

MR. HAILS: Well, I don't blame you.

JUDGE CHENEY: So we are going to have an argument about something known to the world that will not be known to the world.

MR. HAILS: We are not making the claim of CBI. The claim of CBI was made by the producing party. I'm not sure this is confidential and we have evidence that it was publicly sold, offered for sale and used, but this is what it is.

JUDGE CHENEY: So when you pushed back on the party from whom you sought this information, what did they tell you was the basis for keeping this confidential?

MR. HAILS: They did not explain in depth. They maintained their claim of CBI. And we -- we don't have their information. We are not in a position to challenge that.

JUDGE CHENEY: So if I were to make an adjudication about whether or not this is CBI, which I am entitled to do under the Commission rules, who will be representing their interests?

MR. HAILS: We have contact information for their counsel and we can certainly get in touch with them and notify them of your issues, see if they want to come here and defend that claim.

JUDGE CHENEY: Like tomorrow?

MR. HAILS: We can ask. But as a practical matter, I doubt it, but I will certainly have somebody make that -- make that --

JUDGE CHENEY: Surely this is something that you would foresee when you are going to present a prior art argument based on secret prior art that you would have made some arrangements about this.

MR. HAILS: Again, we have shown these slides to counsel for -- they're called the Bayer Company, for the Bayer Company. We have explained to them that we would like to disclose that in court and they declined to waive the confidentiality claim to this material.

JUDGE McNAMARA: This is a -- so what kind of an argument are we relying on this art for? Is it a 102B?

MR. HAILS: It's prior art under --

JUDGE CHENEY: Or is it under the AI? What are we talking about here?

MR. HAILS: It's 102A. It's all publicly known beforehand. Before their invention.

JUDGE CHENEY: So are you relying on the article, the sale of the article itself, not on a printed publication?

MR. HAILS: That's correct.

JUDGE CHENEY: Do they sell this thing under an obligation of confidentiality?

MR. HAILS: I don't know the circumstances.

JUDGE CHENEY: How did you become aware of it?

MR. HAILS: We found material -- again, this is not -- we found material online that suggested they were being sold and marketed. It is a different document than the document presented here. And we pursued it through discovery and we obtained information on their sales of product.

JUDGE CHENEY: Does the third party contend that the sale is confidential or only that the document that they provide you in discovery is confidential?

MR. HAILS: I don't know to that level -- I

certainly know that they have -- we have sales documents which we will -- we are prepared to discuss, again, on the confidential record, and we have materials on the product, which we are prepared to discuss. And it's not our claim of confidentiality.

JUDGE CHENEY: But it is your burden to prove by clear and convincing evidence that this was known to the public. And I would expect you to have a few more answers than you have today.

MR. HAILS: I understand.

JUDGE CHENEY: Okay. Well -- it's not looking good for your burden so maybe you want to do something about that.

MR. HAILS: We'll check.

JUDGE CHENEY: Okay. Proceed.

BY MR. HAILS:

Q Okay. You talked about the CardioGen cart. How do you know it was publicly used in 1989?

A That's what Bracco claims in their original complaint.

Q We have an except from RX-0207. Do you see that?

A Yes.

Q Is this the only document on the CardioGen 82 that you reviewed to develop your opinions regarding its

operation and construction?

A No.

Q Do you have a binder labeled CardioGen 82 prior art documents?

A I do.

Q Are those the documents that you reviewed to develop your opinions regarding the CardioGen 82 product?

A Yes.

Q I'd like to read off the exhibit list and make sure that you have what I have. Does your binder include RX-98?

A Yes.

Q RX-216?

Let's go across.

RX-98, RX-207?

A Yes.

Q RX-211?

A Yes.

Q RX-212?

A Yes.

Q RX-213?

A Yes.

Q RX-214?

A Yes.

Q RX-215?

A Yes.
Q RX-216?
A Yes.
Q RX-217?
A Yes.
Q RX-218?
A Yes.
Q RX-219?
A Yes.
Q And RX-357?
A Yes.
Q Put that aside.
How did you determine that the Klein thesis was published by 2006?
A I have seen declarations by a Dr. Andy Adler, as well as by Carol Watdke, that declare that those were posted on a website first in 2005, taken down as Andy Adler moved to a different location, and then posted permanently, and have been posted permanently since 2006.
Q Can we kick out of the PowerPoint, please, and go to RX-333. Is this the declaration that you referenced from Dr. Adler?
A That's correct.
Q Can we pull up RX-334. Is this the declaration from Ms. Watdke?

A That is correct.

Q Move forward, please. All right. On slide 71 this bubble just came up. The priority date is no earlier than June 2009. Why don't you explain briefly what is your analysis regarding priority date?

A My analysis is that it could be no earlier than June 2009, which is the first time we have a disclosure of an on-board dose calibrator in the patent history record.

Q All right. Do you have a -- have you -- do you have an opinion whether June 2009 is the proper priority date of the asserted claims?

A I have. I do not believe it is the proper priority date.

Q So let's get into that when we discuss anticipation. Let's move forward, please. Slide 72. What are we looking at here?

A This is a cover page from Ran Klein's master thesis which was published -- completed in February 2005, published in 2006, and again relating that the priority date could be no earlier than 2009.

Q All right. Let's move forward. Now we are at slide 80. Are you aware that in an obviousness analysis one assesses the differences between the claims at issue and the priority art?

A Yes, I am.

Q All right. I'd like you to summarize for the Court what are the major differences between the asserted claims and the Klein thesis.

A Well, one of the major differences is that the dose calibrator, the eluant reservoir and the shielded well are on board the cart in the claims. However, in the Klein thesis, the dose calibrator and the eluant reservoir and the shielded well are not on the cart.

Q Just to be clear, claims require a dose calibrator?

A Yes.

Q Does Klein disclose a dose calibrator?

A It does.

Q Do claims require an eluant reservoir? Is that correct?

A That's correct.

Q Does Klein disclose an eluant reservoir?

A He did.

Q And do the claims require a shielded well?

A They do.

Q And does Klein disclose a shielded well?

A He does.

Q But you say that Klein does not disclose them on board a cart; is that correct?

A That's correct. Klein's system, all connected

together, had the materials -- a number of materials on the cart, but the dose calibrator and the shielded well and the eluant reservoir were all off the cart.

Q Let's move forward, please. The blue highlighting, are those the components on the shelf?

A That's correct.

Q Please proceed. So what are you showing with that little animation?

A So we are showing that simply taking those three components and putting them on to the cart we are now would infringe those claim elements.

Q And you said infringe?

A I'm sorry, would not meet those claim elements.

Q Not meet those claim elements. Okay, let's move forward. So now we are on slide 81. Why don't you explain these differences between the asserted claims and the Klein thesis?

A Well, we have other claim elements that have compartments with openings for the generator that at -- are at a lower elevation than the waste bottle. Klein had those same shielding compartments for a generator and a waste bottle but he placed them on a common shelf not at staggered locations.

Q Let's go through this one as well just to make sure we understand it. The claims, do they require a

generator?

A They do.

Q And do they require shielding for a generator?

A Yes.

Q And does Klein disclose those elements?

A He does.

Q The claims, do they require a waste container?

A They do.

Q And do they require shielding for a waste container?

A They do.

Q And does Klein disclose those elements?

A He does.

Q Okay. Now explain the staggered elevation stuff, please.

A The staggered elevation in the claim elements calls for the opening of the generator to be at a lower elevation than the opening for the waste bottle.

Q But in Klein, these components are on common shelf; is that correct?

A They are on common shelf.

Q Let's move forward, please. All right. So what are you showing with that arrow in that animation here on slide 81?

A Here I'm showing that simply by taking the

shielded generator and moving it to the lower elevation would meet that claim term.

Q Let's move forward. So now we are at slide 82. What are you describing here?

A These patents have some specific reminders and warnings that are part of the claim elements. Klein indeed has reminders and warnings, but for different purposes than what are claimed.

Q Okay. Can you give the Court a for instance as to what kind of reminders or warnings might be listed in the claims?

A Shown in yellow is the warning that the eluated volume --

Q Dr. Stone, I'd like to stop you because you're pointing to the Klein thesis. I just want to be sure my question was clear. Specific reminders and warnings from the claims. Can you give the Judge --

A I'm sorry.

Q -- a for-instance as to what kinds of warnings or reminders are we going to see in the claims?

A Yes. Certain reminders, for example, to put a waste bottle, sorry, a sample bottle into a well. We'll see claim elements that relate to an indication that there is -- how much saline is in the reservoir.

Q Okay.

A Things of that nature.

Q Okay. And so then you were pointing to this material shown on right-hand side for Klein. Please, why don't you explain that one more time just to make sure the record is clear.

A Thank you. Indeed, Klein has alerts and warnings. He has a warning here that the generator volume is nearing the maximum amount consider rebuilding the generator. He also has a notice that there is communication failure with the pump and asking them to check wiring.

Q Okay. Let's move forward, please. Now we are at slide 83. Will you please explain to the Court your definition of the person of ordinary skill.

A Yes. A person of ordinary skill in the art would have had a graduate degree with some emphasis in equipment design automation or controls such as electrical engineering, systems engineering, mechanical engineering or a related field or an undergraduate degree in one of those fields with two or three years work experience in radioactive protection systems or in medical device product or instrumentation design and development including working with prototypes and finished products. Such a person would have had a basic understanding through education or experience of general design control principles and

processes and practices for partial or full automation of existing processes or test procedures.

Q Why is -- in your view, why is this definition appropriate for subject matter of an infusion system?

A We are talking about building a system, automating it making it safer, that is an electrical mechanical fluidic system with shielding. These are engineering things that a person would do. They are not the practice of medicine.

Q Okay. We'll see it probably, I guess, tomorrow. Dr. Pelc's definition refers to somebody, for example, with a graduate degree in medicine, with degrees in biology or physiology, somebody with design experience with respect to PET imaging and/or PET imaging systems. Are you familiar with those characteristics of Dr. Pelc's definition of a level of skill?

A Yes.

Q Okay. You did not adopt those here in this definition?

A I did not.

Q And why is that?

A We are dealing with a system to inject a fluid safely. We are not dealing with the practice of medicine. And we are not actually dealing with the imaging process.

Q All right. Let's move forward, please. Now we

are at slide 89. Before we get into specific elements of teachings would you please explain -- I think you talked about GMP design processes. I'm not sure if I got that right. Will you please explain, what kinds of things happen when people take medical devices to market as a finished product.

A We begin with a design input requirement that says -- or a medical -- actually start off with a market requirement. What's it supposed to be? Next we convert those into design input requirements and we break it up into the various systems, lay it out, consider all the standards, all the requirements in order to get such a product on to the market, particularly here in the United States, and then develop it in accordance with that process so that all of those are incorporated into a system incorporating good engineering practices for safety, for ergonomics, for emissions. There are many factors that go from going through what we would refer to as a bench top prototype to a finished product.

Q Do you think a person of skill would look at the Klein cart and think it is market-ready?

A No.

Q Okay. Why don't you explain to the Court what kinds of things people do ordinarily when getting -- you said a prototype, getting a prototype ready for market?

A They look at the prototype, its functionality, determine whether it was arranged in the best ergonomic and the safest in the -- in the situation where it met the required standards and usabilities.

Q Let's move forward, please. We talked about ergonomics. What kinds of ergonomic considerations do people concern themselves when they are taking devices to market?

A Well, one would be where do we put heavy items and particularly heavy items that might need to be moved and we would place those in such a place where it had the least adverse -- least potential for adverse impacts on the person using it.

Q You have an excerpt here from the right-hand side of the slide from I think a reference called Chaffin. Can you please explain, what does Chaffin describe?

A Chaffin describes occupational biomechanics. In particular, he is dealing with how one would deal with a heavy object, so he is talking about in this case reducing the distance of lift for a heavy object in order to minimize any adverse effects from doing that lifting.

Q And what kinds of adverse affects can arise through lifting of heavy objects?

A One can develop muscle strain. One can have problems with one's back. One could drop the object and

process. There are a number of things of trying to minimize the distance of the heavy object.

Q Let's move forward, please. Slide 91. In connection with the Klein design, what does -- what do the teachings of Chaffin tell somebody of skill?

A Well, we have a generator that's a shielded generator. It's a heavy object. From Klein it provides teaching to keep those items where they might be lower to reduce the distance of lift, for example, roll up a generator on a cart, remove it from the cart and place it in the lower portion of the generator.

Q Will you move forward. Okay. And in your view, does -- do the teachings of a reference such as Chaffin provide motivation to move the generator to a lower location within an infusion system?

A Yes, it does.

Q Let's move forward, please. All right. We are at slide 92. Why don't you explain some other considerations that someone might encounter when taking a device to market.

A Well, for example, we have the Klein thesis which had objects that are -- system components that were not on the same location and yet the two system components, the various system components all had to be in the same location for performing a daily test. It only makes sense

to place those system components on a single unit.

Q Okay. You have an excerpt from the Tate reference here on the right-hand side. Will you walk us through this material?

A Yes. This is a PET infusion system that includes radiopharmaceutical, pardon me, a radiopharmaceutical source waste bottle and dose calibrator and shielding all of which are integrated into a single cart.

Q So am I right that Klein discloses a radiopharmaceutical source?

A He does.

Q Does Klein also disclose a waste bottle?

A He does.

Q Does Klein also disclose a dose calibrator with shielding?

A Yes, he does.

Q Would you explain that the dose calibrator is off cart, is that correct?

A No. I'm sorry. In Klein it is off cart, that's correct.

Q In Klein, that's correct.

But here, does this reference show that those three components can be integrated into a common cart?

A It does.

Q All right. Let's move forward. Again, we've got an excerpt from the med RAD system which we will discuss shortly. Please remind the court what is the radiopharmaceutical that is disclosed by Tate in med RAD?

A Tate and med rat both us FDG.

Q Is Tate's disclosure limited to FDG?

A Tate's disclosure is not limited to FDG.

Q And does Tate say that his teachings apply solely to FDG radiopharmaceuticals?

A No. He teaches that it could apply quite broadly.

Q Let's move forward, please. We are on slide 94. Actually, before we get here are you familiar with Ms. Gelbach's testimony regarding an on-board dose calibrator?

A Yes.

Q What did she say about the idea of placing a dose calibrator on board a cart?

A She said it only made sense to do so. It kept people from having to move a heavy cart back to the nuclear medicine lab.

Q Let's move to -- if we can kick out of the PowerPoint, please, and pull up JX-176C at page 151. Starting at line 15 and continuing to the next page on line 12. All right.

She was asked, is that consistent with your recollection, putting the dose calibrator on the cart was a goal for the version 3, she's talking about the JDI designs; correct?

A Yes.

Q If we can have the rest of the quote, please, this will carry over to line 12.

JUDGE CHENEY: I'm confused.

MR. HAILS: Sure.

JUDGE CHENEY: You asked the witness if he heard Ms. Gelbach's testimony. Were you talking about this deposition testimony or were you talking about the courtroom testimony?

MR. HAILS: The deposition testimony.

JUDGE CHENEY: Okay. Thanks.

MR. HAILS: And this is the deposition -- the excerpt from the deposition.

JUDGE CHENEY: Let me just ask the witness. Was that your understanding of what the question was about?

THE WITNESS: Yes.

JUDGE CHENEY: Okay.

BY MR. HAILS:

Q Okay. She was asked putting the dose calibrator on board the cart was a goal for the version 3. She answered, yes, because from the usability perspective, we

were all, not we -- but customers that were using in research were already hooking it to a dose calibrator, they had to roll the machine into the hot lab where the dose calibrator sat made of lead, it's heavy -- you can't -- and it was very difficult to do that and so it only made sense that if we had to talk to the dose calibrator that it be closer to everything. Are you familiar with that testimony?

A Yes, I am.

Q Explain to the Court, what is the concept of usability?

A Usability is the process of designing a component or a part so that the user can use it safely, efficiently, effectively -- other factors come in, but those are the ones we are dealing with.

Q Do you think a person of skill would recognize that infusion system such as Klein's as heavy?

A Yes.

Q Do you think a person of skill would recognize that an infuse system such as Klein would be difficult to roll it into a hot lab to connect it to a dose calibrator?

A Yes.

Q And you would agree with Ms. Gelbach's characterization that it only made sense to place the dose calibrator on a cart?

A Yes.

Q We can kick out of this and return to the PowerPoint, please. All right. So now we are at slide 94. Please explain, how do the teachings of, for example, Tate apply to a design such as Klein's?

A Well, what Tate teaches and what he had done was to take the dose calibrator and put it on board the cart with its shielding.

Q And do you, if someone were to apply it to Klein what would that entail?

A As we just showed we take this assembly and place it here on the cart.

Q All right. Let's move forward, please. We are at slide 95. Earlier you had testified about warnings and reminders. Do you remember that testimony?

A Yes, I do.

Q Okay. Did you find any description in prior art discussing or providing teachings to people about warnings or reminders?

A Yes.

Q Please explain.

A It was an international standard so-called IEC62366, which is a standard for usability of medical devices in particular. And this device has instructions with regard to the usability standards that should be

utilized in designing such a system.

Q Okay. So you have a couple of excerpts here. The first one is on page 18 of this international standard. And it says "The manufacturer shall design and implement the user interface as described in the usability specification utilizing, as appropriate, usability engineering methods and techniques." Do you see the discussion?

A Yes, I do.

Q And, again, what is usability engineering methods and techniques? What does that clause refer to?

A Those are techniques that are utilized to make the device easier to use, safer to use and more effective in its use.

Q Okay. And then you have a second excerpt from the standard taken from page 63 of this Exhibit RX-114 saying that the user has to be aware of the use of the correct consumable, the remaining amount of them whether accessories might be used with a medical device, how to assemble them and how to check their correct functions. Just explain what is the international standard teaching a person of skill with this kind of description?

A To provide the user with indications of what, of how to use consumables, how much remains of them and any accessories, how to assemble them, how to correct their

correct functioning, making sure the user has everything he needs to do the task. Making sure the user does it in a safe and effective manner.

Q Please move forward. Now we are at slide 96 of your presentation. And we've already talked about this screen with the yellow box. Again, remind the Court, what is Klein describing with this screen shot?

A He is reminding the user that it might be time to replace one of the consumables, in this case, he is talking about rebuilding the strontium rubidium generator.

Q Do you think a person of skill would recognize any other components within the Klein system as qualifying as a consumable or an accessory?

A Yes.

Q Please explain.

A So we have a saline bag which is a consumable. We have a waste container which is either a consumable or an accessory and we have a sample vial which is also a consumable or an accessory.

Q Let's move forward. Okay. So that's what you're showing here with the animation on slide 96; is that correct?

A That's correct.

Q Let's move forward, please. Did you see application of this teaching in any other prior art

reference?

A Yes.

Q Please explain.

A In Tate, we see an indication of the amount of saline that's remaining in one of his sample screen diagrams.

Q All right. I'm sorry. What is he -- what is he tracking in this example?

A I believe he is tracking the saline there in this example.

Q I just didn't hear your answer. All right. We'll talk about Medrad in a minute. Let's move to slide 98, please. Okay. As part of your analysis, did you undertake a review to identify any secondary consideration as evidence in this investigation?

A Yes, I did.

Q All right. Did you see any objective evidence to suggest that the differences between the asserted claims and the prior art are not obvious?

A No, I did not.

Q Are you are aware of Bracco's allegations that JDI copied the feature of the onboard dose calibrator from Bracco?

A Yes, I am.

Q Were you here for Mr. Troger when he confirmed

Bracco had not developed a system with an on board dose calibrator during the time of Ms. Gelbach's tenure?

A Yes, I was.

Q Were you here for Mr. Troger's testimony that confirmed that Bracco had not developed a system with on board --

JUDGE CHENEY: Slow down, Counselor, when you're reading long paragraphs like that. It's easy to go fast.

BY MR. HAILS:

Q Were you here for Mr. Troger's testimony where he confirmed that Bracco had not developed a system with an on board dose calibrator during Worrell engineering's tenure with Bracco?

A Yes, I was.

Q Have you seen any materials that suggest that JDI copied any Bracco design materials when developing the RUBY product?

A No, I have not.

Q Have you seen any materials that suggest JDI copied any Bracco patent materials while developing the RUBY product?

A No, I have not.

Q All right. Did you have an opinion whether JDI copied this on board dose calibrator feature from Bracco?

A It is not -- it is my opinion that they did not

copy anything from Bracco.

Q Okay. Are you aware of Bracco's argument there was a long felt need for an on board dose calibrator or that others had tried but failed to place a dose calibrator on board a cart?

A Yes.

Q Have you seen any evidence that this is true?

A No.

Q Have you seen any material that suggested that anyone in the field had recognized a need for an onboard dose calibrator, but was unable to satisfy that need?

A Not that's anyone was unable to supply that need.

Q Okay. Were you here for Mr. Davis's opening statement?

A Yes.

Q I'm going to -- and I will try to go slow. Mr. Davis said in his opening that there is real life evidence that shows JDI tried unsuccessfully for years to make a Rubidium-based PET scanner using the technology that was described in the primary reference that relies upon for obviousness. But that it only succeeded after it hired multiple Bracco employees and design firms, including the inventors. Were you here for that argument?

A I heard that.

Q Okay. Do you agree with this characterization?

A I do not.

Q Were you present for Mr. Donnelly's testimony on Friday when he testified that the University of Ottawa imaged 667 patients in 2004 using the V1 system?

A I was.

Q What does that tell you about whether there was a failure by anyone to make a rubidium-based PET scanner using the technology described in the Klein thesis?

A That belies that statement.

Q Do you recall Mr. Donnelly's testimony when he said that the V2 was used on patients starting in 2010?

A I do recall.

Q Okay. And that V2 was developed by JDI, is that correct?

A That is correct.

Q What does that tell you about whether there was a failure as Mr. Davis said to make a rubidium-based PET scanner with technology described in the Klein thesis?

A That means that that statement is not true.

Q Okay. I'd also like to return to Ms. Gelbach's testimony for a moment. We are going to go to JX-176C starting at page 122. And this is starting at line 17. Actually let's start at line 10, please. Go to the bottom of the page. She was asked about what existed when she

arrived at JDI in 2010. First, she was asked did JDI already have an infusion system developed and she answered yes. Do you see that?

A Yes.

Q Okay. She was asked about the version number. And what did she identify it as?

A She identified it as the version 2.

Q And she was asked was the V2's system's development complete when she arrived in 2010 and what did she say?

A She said no.

Q We can pick up that piece on line 20 on the prior page and then go through here to let's say line 12 so, and can we get the question on the preceding page. Okay. She was asked if JDI had a prototype of the V2 infusion system developed when she arrived. Do you see that?

A Yes.

Q And what did she say that JDI had developed prior to her arrival at the company?

A She says that they had a working system.

Q Right. And then she was asked but the development and activities were not complete. Is that what you said earlier and what did she say needed to be done?

A She said it wasn't pretty yet.

Q All right. And then there should be one more excerpt. Can we go okay. And then if we can pick up from actually line seven on page 123 down to line 17. The line that you had referenced it wasn't pretty yet is on line 12 and then she expanded a little bit. Please explain what Ms. Gelbach explained about the V2 system.

A She stated that the outside still needed a little work in terms of making it commercially ready, functionalitywise it was already there.

Q Okay. Does that tell you anything about JDI's supposed failures to develop anything when it was working on the V2?

A It means there was no failure.

Q Let's return to your PowerPoint, please. All right. I think we can move forward. Okay. So let's walk through the Klein thesis in a little bit more detail. You have, we are on slide 101 and you have a drawing by, I guess, subtitle labeled "Tubing Circuit." Please walk us through this material.

A Tubing circuit includes saline IV.

Q And let's just touch an each component just to make sure that we've got it all explained. So what's the job of the saline IV?

A That's the source of the material that's going to cause the elution of the rubidium chloride from the

generator.

Q The second bullet in this list is a peristaltic pump. Please explain, what does that pump do?

A This supplies the movement and meters the amount of flow that is pumped through either the generator or the bypass line.

Q Let's go to the next component. What is the generator valve?

A The generator valve diverts flow through the bypass line or directs it through the generator to eluate rubidium chloride.

Q We don't have the bypass line marked. Will you show the bypass line to the Court, please.

A Bypass line is here.

Q All right. What's the next component in the Klein thesis? The next component is the strontium-rubidium generator?

Q And what's the job of the strontium-rubidium generator?

A It's a column that exchanges rubidium 82 that's held on the column for the sodium and sodium chloride switch that rubidium chloride.

Q So saline comes in; is that correct?

A That's correct.

Q And rubidium chloride comes out?

A Rubidium chloride solution comes out.

Q Let's keep going. What's the next component?

A The next is the activity counter which monitors the dose while it's being administered.

Q Okay. And what is it monitoring in this drawing?

A That's the radioactivity from the Rubidium-82.

Q All right. Let's move forward, please. What's the next component?

A The next is the patient valve which directs the eluant either to the patient line or to the waste container.

Q Okay. What's the next component?

A The next component is the waste container with which receives waste that we don't want to eluate to a patient.

Q All right. And then the next one, please. The dose calibrator, what's it's job?

A The dose calibrator has two functions. It is used to confirm the operation of the on board activity counter and it's also used to measure Strontium breakthrough.

Q And then the final component is what?

A The final component is the computer which controls the functions of each of these components or takes

information from them.

Q Let's move forward, please. Slide 103. Let's talk about the computer. How is the computer configured?

A The computer is configured to control the system. To have all of its inputs via a touch screen and to guide the user through all the command operations.

Q You have here a bullet touch screen computer. Is it a touch screen computer?

A It is a touch screen computer.

Q And you have an excerpt from the reference in text. Can you just summarize what is relevant about this excerpt?

A What's relevant is that it informs the user. It displays all the functions. It limits the user input so that it's all valid. Make sure it operates it safely. All the operations take place through that touch screen. It can add others at relevant states and as you can see here there are certain buttons that are black and available to use. There are other functions that are grayed out so that the user cannot perform those in this modality.

Q So is it possible to use the Klein system without going through the touch screen computer?

A No. It is not.

Q And I'm not sure that we, go through it in depth but just at a high level this screen shot shown in the

upper right, choose run type. What is this an example of with this screen shot?

A This is an example of how the operator would perform functions. It's set up so that he can, from this point he can do a flush, a calibration or he can do any of three types of activity.

Q And then you mentioned that there was some others that were grayed out. Why would those be grayed out in this particular screen?

A Because apparently this user has entered a user identification that allows them to perform normal functions but it does not allow them to perform some of the research functions.

Q Let's move forward, please. So we are at slide 104 and you added a button. I'm sorry a bullet on the left-hand side about tracking performance during operation. Please explain how Klein described the subject matter.

A So this is a very strong influence of his usability that he has already incorporated into his prototype. It says the real-time graphics display includes a system diagram and we see a system diagram here with updated information about the state of the system. So we can see what's happening in this case. It includes the current activity rate reading, the flow rate, the valve status, the expected accumulated activity at the patient

outlet. It also provides progress bars that are included for each stage of the elution so as to facilitate monitoring of the system and provides an emergency stop button that's enabled throughout elutions to take immediate effect to bring the system to the safe mode.

Q Do you see a progress bar in the screen shot that he has provided here?

A I do. In this case it's a progress bar for the function taking place.

Q Do you see an emergency stop button in this screen shot that's been provided?

A I believe if I back up and clear that we can see the stop button that's displayed for the user's input and put the system into a safe mode.

Q On the prior slide you had mentioned that there were five run types and then there were three others that were grayed out is that correct?

A That's correct.

Q Does Klein provide screen knots for each and every one of his run types in his disclosure?

A No, he does not. That was not the purpose of his thesis but he says those functions are supplied on every elution screen.

Q Let's move forward, please. We are at slide 106. There is a new bullet providing statistics at the end

of infusions. Please explain, how does Klein disclose this subject matter?

A Well, as his thesis states at the end of the elution reports must be generated based on the type of elution and its mode of completion. On successful completion, a gray screen must list statistics relevant to the elution. In addition, a separate window must list a comprehensive display of all the statistics in addition to activity curves relating to the activity rate and the integrated activity at the patient outlet.

Q Okay. And so this screenshot is entitled "Test Activity Elution Results." Do you see that?

A Yes.

Q And does he provide samples of the kinds of statistics and other information that he has described in this excerpt?

A He does.

Q Why don't you just walk us through this briefly.

A So we have the elution time. We have the eluated volume. We have a volume deviation that occurred. We have an eluated activity. We have the profile of the generator. We have the activity deviation. We have the requested activity. And down in the right-hand side we actually see graphs of what occurred during that elution.

Q All right. Let's move forward, please. All

right. We are at slide 108. You have a bullet about providing alerts and warnings. And I think we've discussed this, but why don't you just kind of walk us through this next excerpt that you provided and explain again, how does Klein disclose this subject matter?

A As he puts it at the end of elution reports must be generated based on the type of elution and its mode of completion. If an error is detected a red screen including details of the error and recommendations to resolve the issue must be displayed. If the emergency stop button is pressed a yellow screen must contain an appropriate message.

Q Is this the only warning this generator elution warning that Klein describes his thesis?

A No. He also has a warning for when the waste bottle is nearly full.

Q So Klein provides screenshots for all the other warnings described in his thesis?

A He does not.

Q I should have asked on the previous slide that was the one dealing with test results the results screen. Do you remember that?

A Yes.

Q Did Klein provide screenshots for each and every elution type that he describes in his thesis?

A No, he did not. He simply describes what each of those would contain.

Q Let's move forward, please. Slide 110. Here, you have a subtitle referring to a daily protocol. Will you explain, what does Klein describe as the daily protocol?

A The daily protocol is a procedure which must be carried out prior to doing any patient elutions.

Q Okay. Why don't you walk us through this flow chart and let's start with the little ascending arrow at midnight.

A At midnight, the system permissions are reset so that no patient elutions are enabled and before any of that can take place this daily protocol has to be performed.

Q So the three pieces, do you see that, the daily flush, the calibration and the patient elution runs?

A Yes.

Q And so let's walk through each piece. Why don't you start us off with the daily flush that begins after midnight.

A The daily flush is the process of flushing the -- any accumulated waste products that we don't want to go to a patient Strontium breakthrough that might eluate from the generator. I'm pointing at the wrong thing. That might be in the generator and in the solution. Clearing

out the lines and pumping all of that into, first, the dose calibrator. And also flushing the remainder of the lines for any accumulated air.

Q Do you have an animation to show how that might occur? The system just basically pushes saline everywhere, am I right?

A It pushes through all of the lines to make sure it's clear.

Q Let's move forward, please. Let's go to slide 1121. Here you have some description on the calibration phase. Please explain how this phase works in the Klein thesis.

A After the flush occurs after a 10-minute wait, which the computer determines, a calibration elution takes place. In this case as the animation shows, saline is pulped through the generator through the on board activity counter into the reservoir that is in the dose calibrator taking the data that would be necessary for that calibration function to take place.

Q All right. So the system eluates rubidium into the dose calibrator; is that correct?

A That's correct.

Q All right. And then you have two bullets listed here under the, I guess, the major heading "Calibration." One is recalibrate the calibration constant of the activity

detector. Remind the Court where, is the activity detector?

A The activity detector is here.

Q Okay. And then how does the system recalibration the calibration constant of that unit?

A So as Klein describes in his thesis, the activity measured while the eluant is flowing through the activity counter is integrated while that takes place and then as soon as that eluant is, has filled the dose calibrator to the proper level a reading is also taken place and the calculated or reported activity here, the total activity is compared with what's measured by the dose calibrator and if necessary the calibration constant to make sure that it is correct as adjusted.

Q Okay. So there is a reading from the purple activity detector; is that correct?

A That is correct.

Q Who does that reading in the component here?

A The computer.

Q And is there a reading from the dose calibrator as part of this effort?

A Yes.

Q And, again, who does that reading?

A That's done by the computer.

Q And then who computes the calibration constant

of the activity detector?

A The computer.

Q All right. All right. So the next phase is computing strontium breakthrough levels; is that correct?

A That's correct.

Q All right. Let's move forward and talk about that. All right. Tell us how breakthrough testing occurs in the Klein thesis.

A Well, beginning with where we were the last you eluate the sample to the dose calibrator and Klein uses that same dose that he uses for the calibration sample. He samples the activity in the dose calibrator once that sample that has been placed in the dose calibrator. He waits. I say he. The computer then waits 30 minutes, and, once again, takes a reading from the dose, from the sample that has remained in the dose calibrator and then it computes the breakthrough levels for Strontonium-82 and Strontium-85 using the formulas shown below.

Q So let me make sure I understand. We have a sample in the dose calibrator. We have dualing clickers. We have a sample in the dose calibrator; is that correct?

A That's correct.

Q And who does the reading of activity from the dose calibrator?

A It's done by the computer.

Q And then there is a wait; is that correct?
A That's correct.
Q And then a second sample. Is that correct?
A That's correct.
Q Again, who does the -- who reads the activity from the dose calibrator?
A The computer.
Q And which component computes the breakthrough levels for strontium-82 and strontium-85?
A The computer.
Q All right. And what's the significance of this math here on the left-hand side of the slide?
A Those are the formulas for computing the ratio of strontonium-82 at the -- that's still in the eluant and the strontium 85 still in the eluant based on those measurements and the time.
Q Let's move forward. What does Klein say happens if the system fails a strontium breakthrough test?
A The system fails a strontium breakthrough test, then patient elutions are not enabled by the system.
Q Can you walk us through how Klein describes this aspect.
A Certainly. In his thesis, he states that the system must ensure compliance with the daily protocol described in the previous chapter. A flush followed by a

calibration run and a successful breakthrough measurement must be completed in order to enable patient elutions for the remainder of the day. The system should delay at least 10 minutes between runs.

Further, he says the amount of strontium breakthrough activity is strictly limited to the Health Canada guidelines. And this issue is addressed by the daily breakthrough tests as part of the daily protocol that's ensured by the system. And then also he states the Rubidium-82 infusion system software must ensure that the protocol is followed. That is, each run is enabled only after the prerequisites have been completed successfully. So system software that is making sure that this is accomplished.

Q Okay. And then this sentence in the middle of this excerpt on page 39 so the first major excerpt that you have. You said a flush followed by a calibration run and successful breakthrough measurement must be completed in order to enable patient elutions for the remainder of the day. If you're a person of skill and you read that passage, and you read the other passages that you have, what is your conclusion about what happens if there is an unsuccessful breakthrough measurement that occurs during a calibration run?

A Patient elutions are not enabled. They can't

take place.

Q Let's move forward. Slide 114 and we are back to the flow chart of the daily protocol. All right. And we've just talked about the calibration run. Is that correct?

A That's correct.

Q And is that where the strontium breakthrough test occurs?

A That is correct.

Q All right. And then the next stage in this drawing is the patient elution runs; is that correct?

A Yes.

Q And are those the ones that Klein is referencing when he is talking about enabling the patient runs for the remainder of the day?

A That is correct.

Q Please explain, how do the patient elution runs occur?

A The patient elution runs as they occur, the three types that occur are constant flow and constant time elutions and he also has a constant activity elution.

Q All right. Please move forward. Now, we are on slide 115 of your presentation. Why don't you explain how this constant flow rate and constant time elutions occur in the Klein thesis?

A The profiles shown are, could be a profile for either constant flow or constant time. What happens is saline is pumped through the generator. The rubidium chloride that is existing in the generator begins to be pushed out. That concentration of radioactivity increases to a maximum level and then begins to drop off as what was in the generator, a generator begins to be washed outs and then it approaches a level that's proportional to the rate that's reflective of the rate at which strontonium-82 is decaying into Rubidium-82.

Q Okay. So these curves marked in blue, do they represent radioactivity?

A Yes.

Q And we have heard discussion earlier today about something called a bolus profile. Are you familiar with that discussion?

A Yes.

Q All right. Is this -- is this curve -- are these curves indicative of bolus profiles?

A Yes, they are.

Q Okay. So again there is a peak. Why does the peak exist in this drawing?

A Because there is already a stable if you would an equilibrium level of Rubidium-82 in the generator when we start to pump through. The radiation level rapidly

increased to represent that concentration but that concentration now starts to die off as it's pumped out and we have only what's being produced combined with what's mixed previously and it decays off to a steady state value.

Q And so the steady state value, is that the -- is that represented by this tailing off level that's shown here on the right-hand side of these two graphs?

A That is correct. That's approaching at end topically the steady state production rate.

Q And there are two different sets of curve, I guess, with two different peaks. Why are these peaks different from each other?

A One is taken on March 23rd, 2001, the higher one. The lower one April 2nd. That represents the decay in the amount of Strontium-82 that's in the generator available to produce Rubidium-82.

Q What's represented on the y-axis of this graph?

A On the y-axis is the activity in megabecquerels per milliliter.

Q So the activity that's represented on the March, I guess, 23rd graph that peak is roughly you call it 85 megabecquerels. Does that sound right?

A That's correct.

Q And in the curve that corresponds to the April 2nd date that's at a lower value, is that right?

A That's correct.

Q And what is that value?

A That value is approximately 60.

Q All right. So those are constant flow and constant time. Let's move forward, please. Why don't you explain how constant activity elutions are described by the Klein thesis.

A Klein's whole motive in doing this or, sorry, primary motive was to come up with a better control algorithm to produce constant activity elution. In green is constant activity elution at an activity level of roughly three megabecquerels per second.

Q Okay. And does the Klein system hit that idealized curve?

A No.

Q What does Klein's system do?

A Well, he is showing one of the algorithms and its results. What he does is alternate between the peak value, a peak value of roughly five year, back down to about one and a half, and then oscillates about that mean value. That's what would be measured at the activity detector.

Q Okay. In the testimony that we heard this morning there was a discussion relating constant activity elutions to avoidance of sensor saturation. Are you

familiar with that discussion?

A Yes, I am.

Q Will you explain, how does this constant activity elution avoid that phenomenon?

A Certainly. If you notice in the previous slide we went up to levels of roughly 60 and 90 megabecquerels which would produce a very rapid count rate at the detector and result in saturation, the detector unable to keep up with the rate at which photons were arriving. Here, we never exceeded five megabecquerels a much lower level and that's a level that the sensor would be able to keep up with and thus be able to efficiently use more of the photons that are emitted.

Q And Mr. Walker's opening, he represented that constant activity elutions permit radiation dosing to remain at consistent level as a generator ages. Are you familiar with that discussion?

A Yes, I am.

Q Will you explain, how does constant activity elutions achieve that goal?

A Certainly. By starting out to receive radioactive material from the generator and then as soon as it reaches a given threshold stopping receiving the fluid flow from the generator instead from the bypass line and we start until it drops to a given level and once again from

the generator oscillating between the two sources and resulting in this lower level in order not to achieve, and we can do that whether we start off with a very high concentration of rubidium in the generator or whether they start off with a significantly lower concentration.

Q Let's move forward, please. We are at slide 117. Why don't you explain, how does the system achieve that sawtooth wave form?

A We are going to have to back up in a moment and show the animation. Let's talk our way through it. We, first of all, as we stated allow the fluid to flow through the generator to the activity counter. When it reaches a given level it shifts and stops flow from the generator and instead allows saline until it drops below a given level. Both of those continuously being administered on to the patient so that the average value that's administered to the patient is closer to that same ideal square wave.

Q So if we can just work from memory. But we saw earlier in the prior graph that when the sawtooth wave is rising there is a switch and then it causes the system causes the radiation to decline. Do you remember that?

A That's correct.

Q All right. And so who, how does that occur?

A The computer is sensing the radiation level detected by the activity counter and repositions the

generator valve to direct flow in the bypass line instead of through the generator.

Q So is that the purpose of the activity detector?

A That's correct.

Q And it goes through the computer and the computer is making that decision; is that correct?

A The computer does all the control.

Q And similarly, when that sawtooth wave was dropping, we saw that it would drop to a certain level and then it would switch and it would start to rise again. Do you remember that?

A I do.

Q Okay. And, again, how does that phenomenon occur?

A That takes place once again with the computer accepting the level and repositioning the generator valve based on the reading from the activity counter.

Q We are going to get into claims shortly, but before we do I would like to flip to RX-106, please, page 49. Let's start with Section 3.3. Highlight to the end of the page, please. Mr. Davis's opening, he put up this passage, and he argued that it would dissuade a worker of ordinary skill from altering the Klein system in the way that you have proposed. Are you familiar with that argument in the opening?

A Yes.

Q I'd like to walk through this material to make sure we understand it. Okay. And he highlighted, I think, the second sentence of this passage saying that the layout of the saline lines sensors and actuators is crucial to implementing a physical system that is easy to control. Do you see that?

A I do.

Q All right. So what kind of control is Klein trying to achieve?

A Klein is trying to achieve constant level elutions.

Q Okay. And then the next passage says during a flow of -- during a flow of a radioactive volume through the lines, both a transport delay and a radioactive decay take place. Therefore, the activity at output is delayed and reduced in relation to the activity at the input. So please explain to the Court, what is transport delay and what is radioactive decay?

A Transport is the delay that is the time that it takes from fluid to move from one location to another.

Q And a rubidium system is there decay of the radioactivity as it moves from point A to point B in the system?

A Yes. The rubidium has a 76-second half life

that has been spoken of, that is, in 76 seconds it decays to half the value of what it was previously. So the amount of time that it takes to transport, one can readily compute how much it has decreased from where it was measured to that second spot.

Q And you said one can compute it. Does Klein give you information to figure out how to compute these values?

A He does. These are the physical equations that can be used to compute that value.

Q Let's turn to the next page, please. We are at the top of page 50, the first major paragraph. "However." Let me just highlight the paragraph or show the paragraph, please. All right. Klein goes on and says "However, if the flow rate is not constant computation of the delay time becomes more difficult." Do you agree with this characterization that computation of delay time would be difficult in a system without constant flow?

A Yes. Because each material -- each piece of material would have a different amount of time passing through there and that would make that computation more difficult.

Q Let's skip ahead to the next paragraph, please. The one under the equation. Klein further says that variation of flow rate would make prediction of activity at

the end of a line difficult and potentially inaccurate. Do you see that passage?

A I do.

Q Do you agree with that discussion?

A Yes.

Q All right. And let's move forward again. I think we have to talk about the pump speed variation so let's go to the next page and talk about bypass ratio control. Can you show the text and also the drawing, please. All right. This is the section called bypass ratio control. And Klein says the above problems can be resolved by setting a constant flow rate at the start of the elution process and controlling the ratio of the saline that flows through the generator, point G in figure 3-3. The remaining portion of the saline would flow through the generator bypass line. Can you explain, what is Klein saying here?

A Well, he is saying that we set a constant flow rate here so that the sum of these two would always be constant. So we have point G was coming out of the generator and we have this point, which is what would come out of the bypass line at alternate times.

Q Okay. And then the next part of this passage says the two lines would then be merged, point M, upstream from the activity counter, point C, thus the flow in the

combined line remains constant. This allows computing of the transport delay from the counter to the patient outlet, point O.

Okay. So let's just walk through it. Where does the merger occur in this drawing?

A The merger occurs here, point M.

Q And is that upstream of the activity counter?

A Yes, it is.

Q All right. Just point out point C, please.

A Here is the activity counter.

Q And the patient outlet is where?

A The patient outlet is here.

Q And so is it correct that the flow in the combined line after the point M remains constant?

A In Klein's thesis and in his design, yes.

Q Okay. Let's move to the next part of this paragraph. It says the flow rate only varies in the line volume connecting the generator to the merger VGM based upon flow ratio R in order to reduce the variability in transport delay and decay this line volume must be kept to a minimum. Okay, so where is the generator?

A Generator is here.

Q And where is the merger?

A Merger is here.

Q And what is the line volume that Klein is

recommended to keep to a minimum?

A Only this volume between this point G and this point M.

Q Okay. Do you see any discussion in this passage referring to the relative elevations between the waste bottle and the generator?

A No. Those are completely irrelevant.

Q And how about any discussion of the relative elevations of the shielding structures for the waste bottle and the waste generator?

A They are completely irrelevant.

Q All right have you reviewed respondents' Ruby product in the course of your analysis?

A Yes.

Q And have you seen any evidence indicating adoption of these teachings from Klein in the real world?

A Yes, I have.

Q Can you pull up JX-0007. All right. Do you recognize this document?

A Yes.

Q All right. What is this document?

A This is the user manual for the Ruby 3 system.

Q Let's switch to page 9, please, and specifically figure 2. Will you explain to the Court, where is the generator in this drawing?

A Generator is here.

Q Where is the merger point in this drawing?

A Right here.

Q And where is the activity counter in this drawing?

A Right here.

Q When Klein says he wants to keep the line volume between the generator and the merger point to a minimum, does the design of the Ruby system reflect this concept at all?

A Yes, it does.

Q All right. Let's move forward, please. Let's go back to the PowerPoint, please, and if we can advance. Let's talk about the claim. Let's talk about your obviousness opinion first. We are at slide 119 of the presentation and if you'll move forward and start with the '869 patent on slide 121 and then if you will move forward one more time, let's talk about claim 1 of the '869 patent, please. The claim 1 begins with an infusion system on board a cart that comprises a cabinet structure that comprises a platform with an exterior shell. Did you see this subject matter taught by the prior art?

A I do. We see the cabinet structure shown here.

Q All right. Do you see a platform?

A They have a platform here at the base.

Q And do you see an exterior shell?

A We have an exterior shell.

Q Does that exterior shell extend upwardly above the platform?

A Yes, it does.

Q Please move forward. The claim says that the exterior shell must have a front side and a rear side and two side walls connecting the front side to the rear side and the top surface. Did you see that subject matter taught by the prior art?

A Yes.

Q Please explain.

A We have a front side. We have two side walls. We have a rear side, though it's not shown in the picture. And we have a top surface.

Q Continuing, the claim says wherein the platform and the exterior shell collectively defined an interior space of the cabinet structure. Did you see that subject matter taught by the prior art?

A Yes.

Q Please explain.

A We have an interior shelf that's defined by the platform and the exterior shell -- I'm sorry, the interior space that's defined by the platform and the exterior shell of -- defining the interior space of the cabinet shell.

Q Let's move forward, please. Is that it?

A That's it.

Q All right. Let's move -- continue. And what's the significance of citation to Tate or to CardioGen?

A Well, those are two other examples of carts, a cabinet structure that meet all these claim elements.

Q Let's move forward, please. Let's go to slide 123. The claim says wherein the interior space of the cabinet structure is configured to receive a strontium rubidium generator. Did you see that subject matter taught by the prior art?

A We have a strontium rubidium generator.

Q Is it in the interior case of the cabinet structure?

A It is, whether it's in this lower position or whether it's in the original position that Klein showed.

Q The claim says that the strontium rubidium radioisotope generator has an inlet tubing port configured to receive saline. Do you see that subject matter taught?

A Yes, I do.

Q Please show me, where is the saline?

A Here is the saline and it discharges it through the generator which has an inlet tubing port.

Q The claim also refers to an outlet tubing port configured to discharge a rubidium radioactive eluant. Do

you see that taught by the prior art?

A Indeed, strontium rubidium generator as disclosed by Klein has an outlet port configured to discharge the radioactive eluant.

Q Let's move forward, please. Claim 1 says you have to have an opening through the exterior shell configured to provide access to the strontium rubidium radioisotope generator. Did you see that subject matter taught by the prior art?

A Yes.

Q Please explain.

A We have an opening in the front, the access to the strontium rubidium isotope generator can be -- the cabinet structure can be accessed through the front.

Q The claim repeats the requirement that the generator must be within the interior space of the cabinet structure. Just point out where is the exterior space?

A The interior space is here.

Q Let's move forward. So that was slide 124 and now we are at slide 125. The claim refers to an opening through the top surface of the exterior shell configured to provide access for inserting a waste bottle into or removing the waste bottle from the interior space of the cabinet structure. Did you see that subject matter taught by the prior art?

A Yes, I did.

Q Please explain.

A It was shown in the green outline that we have here and then the photo where it's labeled there is a generator access which would allow access to the waste bottle for removing the waste bottle from the interior face of the cabinet structure.

Q Let's move forward. All right.

A Sorry.

Q Let's go back. Let's remind the Court, where is the waste bottle inside the cabinet structure?

A Klein shows the waste bottle here.

Q Let's move forward. That was slide 125. Now we are at 126. The claim requires a computer with a touch screen display. Did Klein teach that subject matter?

A Yes, he did.

Q Show me, please.

A There is the touch screen display and here is the LCD touch screen on the cart.

Q The touch screen display must be configured to receive an input from a user for controlling operation of the infusion system. How does the prior art teach that subject?

A As we discussed, the Klein thesis says that all inputs are via the touch screen display. Here is a sample

touch screen display.

Q It says wherein the touch screen display is mounted on a vertical post having a top end extending above the cabinet's structure. Do you see that subject matter?

A Yes, I do. And here is the post mounted that extends above the top end of the cabinet structure.

Q Let's move forward, please. Page 127. A first shielding compartment in the interior space of the cabinet structure having a first opening facing vertically upwardly through which the strontium rubidium generator can be inserted into and removed from the first shielding compartment. So does Klein teach a first shielding compartment for the generator?

A Yes.

Q All right. Show me.

A He has the generator was placed in the cart and surrounded by lead rings to provide maximum radiation shielding. And we talked about where the generator was placed here in the top shelf or down below.

Q Okay. Do lead rings define a first opening facing vertically upwardly?

A Yes, they do.

Q Would that opening be one through which strontium rubidium radioisotope generator can be inserted into or removed from the lead ring?

A Yes, it is.

Q Move forward, please. You have a citation to Tate. Why did you cite to Tate?

A Because Tate has his radioactive source configured such that it can be -- has an opening that's facing vertically upward and the radioactive source can be inserted into and removed from that shielding compartment and that's on the interior of the cart.

Q If you're going to go to market with a newfangled rubidium infusion system let's say in 2006, are you going to sell it with a shielding structure made out of lead rings?

A No.

Q Why would you say that?

A They could easily be displaced. It's not in a tight configuration. They could bounce around. There are lots of reasons. Just standard thing to make this an integral part of a system that's put together.

Q What kind of alternate configurations might you consider?

A I could use a molded assembly. I could use a machined assembly, assembling those together. I'd make something that's sturdy and not easily shaken apart.

Q And does Tate have relevance to that discussion?

A I'm sorry?

Q Does Tate have relevance to such a configuration?

A Yes, it does.

Q Please explain.

A Tate has a product or a drawing of a product very similar of a product that actually went to market. He has that where the -- there is a well that is basically molded into the top surface itself is shielding material and it's a shielded well that he puts that material in. It has vertical access.

Q Let's move forward, please. Claim requires a first door accessible by the opening through the exterior shell. That door is being configured to provide access to the first shielding compartment and to close over the first opening. All right. So let's talk about the shielding compartment. Well, why don't you just walk us through actually what are you showing here in slide 128?

A Well, what we are showing here is a generator on Klein that had -- surrounded by lead rings. His first shielding compartment, Klein doesn't necessarily talk about a door for it. However, he did have an access door as he woo talked about here that could give access to the generator, but Tate indeed has a door over his radioisotope source. Doors are standard things that are used in virtually every facility that I've seen with regard to

shielding compartments.

Q Okay. So that's actually a good question. This claim refers to a first shielding compartment with a vertically facing upward opening for the shielding compartment. Are you familiar with that?

A Yes.

Q Do you have a view as to whether that is a unique configuration in shielding design or is it a common configuration in shielding design?

A That's a very common configuration it allows a user to approach a radioisotope source and be able to get easy access to it without being exposed to radiation that's coming directly out. He would have to lean over the source in order to be exposed to radiation if the access is vertical rather than coming horizontally.

Q All right. So if you're approaching such a structure and it were open and radiation were issuing from it, where would the radiation go as you -- from such a configuration?

A At the person approaching it.

Q I'm sorry. Vertically facing upwardly --

JUDGE CHENEY: Maybe this is a sign that we need to stop because --

MR. HAILS: Can't argue with that, your Honor.

JUDGE CHENEY: Because you cannot be helped.

Okay. So please mark that you're going to re-ask this question tomorrow when everyone is fresh.

You may step down for now, Dr. Stone. I'll remind you not to discuss your testimony with anyone over the evening.

How are we doing on time, Counsel?

MR. DAVIS: Your Honor, Complainants are a little bit over their estimate, but we are on track. We'll be able to come in within the time limits.

JUDGE CHENEY: What about Respondents?

MR. WALKER: My timers are telling me we are about the same. We are close. We are a little over.

JUDGE CHENEY: Staff.

MR. KOO: I understand the Staff is coming in under. So -- I think we should be okay.

JUDGE CHENEY: Okay. So I'm hearing that we are going to wrap this hearing up on Wednesday, presuming that we get a full day in tomorrow. Does that sound like what everyone understands?

MR. DAVIS: Yes, Your Honor.

JUDGE CHENEY: Any housekeeping matters that we need to discuss before we adjourn for the evening?

MR. DAVIS: Not right now, Your Honor. Not for Complainants.

MR. WALKER: None for Respondents.

MR. KOO: Nothing from the Staff.

JUDGE CHENEY: Get some rest. Practice speaking slowly in the mirror. And we'll see you tomorrow.

We are off the record.

(Whereupon, at 4:40 p.m., the hearing was adjourned, to be reconvened at 9:00 a.m., on Tuesday, April 16, 2019).