1 (Pages 94 to 97)

			1 (Pages	94 to 97
	Page 94			Page 96
	UNITED STATES PATENT AND TRADEMARK OFFICE	1	A P P E A R A N C H	2.5
	BEFORE THE PATENT TRIAL AND APPEAL BOARD	2	ON BEHALF OF THE PETIT	
	X	3	JEFFREY N. COSTAKOS,	
	MICRO MOTION, INC.,	4	Foley & Lardner LLP	LSQUIKE
	Petitioner,	5	777 East Wisconsin Avenue	
	,	6	Milwaukee, Wisconsin 5320	2 5206
	v. Inter Partes Review	7	414-297-5782	2-3300
	No. IPR2014-00392 INVENSYS SYSTEMS, INC.,	8		
		9	jcostakos@foley.com	NT OWNED.
	Patent Owner.	10	ON BEHALF OF THE PATE	
		11	JEFFREY L. JOHNSON, E	SQUIKE
	Patent No. 8,000906 Issue Date: August 16, 2011		DLA Piper LLP (US)	2000
	Title: DIGITAL FLOWMETER Volume II	12	1000 Louisiana Street, Suite	
	X	13	Houston, Texas 77002-5005	
		14	713-425-8445	
	Continued Videotaped Deposition	15	jeffrey.johnson@dlapiper.co	m
	of JEFFREY S. VIPPERMAN, Ph.D.	16	-and-	
	Reston, Virginia	17	JAMES M. HEINTZ, ESQU	JIRE
	Thursday, December 11, 2014	18	DLA Piper LLP (US)	
	9:13 a.m.	19	One Fountain Square	
		20	11911 Freedom Drive, Suite	
		21	Reston, Virginia 20190-5602	2
		22	703-773-4148	
	Pages: 94 - 176	23	jim.heintz@dlapiper.com	
	Reported by: Amy E. Sikora-Trapp, RPR, CRR,	24	ALSO PRESENT:	
	Former CSR-NY, CLR	25	Orson Braithwaite, Videograp	her
	Page 95			Page 97
1	Videotaped Deposition of	1	December 11,2014	
2	JEFFREY S. VIPPERMAN, Ph.D., held at the	2	CONTENTS	
3	offices of:	3	EXAMINATION OF	
4	DLA Piper LLP (US)	4	JEFFREY S. VIPPERMAN, Ph.D.	PAG
5	11911 Freedom Drive, Suite 300	5	By MR. COSTAKOS	99, 171
6	Reston, Virginia 20190-5602	6	By MR. JOHNSON	158
7		7		
8	Pursuant to notice, before Amy E.	8	EXHIBITS	
9	Sikora-Trapp, Registered Professional Reporter,	9	PREVIOUSLY MARKED	PAGE
10	Certified Realtime Reporter, Former Certified	10	1067 previously marked	100
11	Shorthand Reporter (NY)(license unrenewed),	11	2015 previously marked	119
12	Certified LiveNote Reporter, and Notary Public	12	1001 previously marked	119
13	within and for the Commonwealth of Virginia.	13	For proviously marked	
	when in the for the Common wealth of virginia.	14		
14		1 15		
14 15		15 16		
14 15 16		16		
14 15 16 17		16 17		
14 15 16 17 18		16 17 18		
14 15 16 17 18 19		16 17 18 19		
14 15 16 17 18 19 20		16 17 18 19 20		
14 15 16 17 18 19 20 21		16 17 18 19 20 21		
14 15 16 17 18 19 20 21 22		16 17 18 19 20 21 22		
14 15 16 17 18 19 20 21 22 23		16 17 18 19 20 21 22 23		
14 15 16 17 18 19 20 21 22		16 17 18 19 20 21 22		

			2 (Pages 98 to 101)
	Page 98		Page 100
1	PROCEEDINGS	1	
2	Whereupon,	2	Q. Okay. I'm going to hand you what has been previously marked as Exhibit 1067.
3	JEFFREY S. VIPPERMAN, Ph.D.,	3	(Exhibit Number 1067 previously
4	called as a witness, having been first duly	4	marked.)
5	sworn by the Notary Public (Amy E. Sikora), was	5	MR. COSTAKOS: And just for the
6	examined and testified further as follows:	6	record, this is the model D meter supplement slug
7	THE VIDEOGRAPHER: This is volume	7	flow and loading/unloading instruction manual.
8	two, tape number one of the videotaped deposition	8	Q. So this supplement relates in part
9	of Dr. Jeffrey Vipperman, taken in the matter of	9	to batching; is that right?
10	Micro Motion, Inc., Petitioner, versus Invensys	10	A. Can I just have a minute, please?
11	Systems, Inc., Patent Owner, in the United States	11	Q. Yeah, sure.
12	Patent and Trademark Office before the Patent	12	A. Okay. Yes, this is a add-in for
13	Trial and Appeal Board, inter partes review	13	the model D meter that helps for the operation of
14	number IPR2014-00392.	14	running a single batch of fluid through the
15	This deposition is being held at	15	flowmeter. It helps correct for the fact that
16	the DLA Piper LLP, located at 11911 Freedom	16	the model D cannot maintain oscillation during
17	Drive, Reston, Virginia, on December 11, 2014, at	17	the course of one batch, and it sort of inhibits
18	approximately 9:13 a.m.	18	the the signal as to cut down on the erroneous
19	My name is Orson Braithwaite, here	19	readings.
20	with our court reporter, Amy Sikora-Trapp, and we	20	(Discussion off the record.)
21	are from Sound Deposition Services.	21	Q. Okay.
22	For the record, will counsel	22	MR. COSTAKOS: I move to strike
23	please introduce themselves.	23	the last part of that answer as nonresponsive.
24	MR. JOHNSON: Jeffrey Johnson from	24	Q. So this model D supplement is
25	DLA Piper, on behalf of Invensys Systems, Inc.	25	meant to handle the situation of separate batches
	Page 99		Page 101
1	and the deponent.	1	flowing through the flowmeter?
2	MR. HEINTZ: James Heintz from DLA	2	A. It it discusses how to handle a
3	Piper, on behalf of the same parties.	3	batch at a time.
4	MR. COSTAKOS: Chuck Costakos,	4	Q. Okay.
5	Foley & Lardner, on behalf of petitioner	5	A. And it suggests that the meter
6	Micro Motion, Inc.	6	is is off in between batches.
7	THE VIDEOGRAPHER: Now will the	7	Q. So if you look at the second page
8	court reporter please swear or affirm the	8	of the document, which is the page that says,
9	witness.	9	"Slug Flow Inhibit Setup Instructions"?
10	PROCEEDINGS	10	A. Okay.
11	Whereupon,	11	Q. Okay. Under "Scope," you'll see
12	IEEEDEV C VIDDEDMAN DL D	12	
1.3	JEFFREY S. VIPPERMAN, Ph.D.,		there's a reference to batching tanks.
13	called as a witness, having been first duly	13	Do you see that?
14	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was	13 14	Do you see that? A. Okay.
14 15	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows:	13 14 15	Do you see that? A. Okay. Q. You see that it says that; right?
14 15 16	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL	13 14 15 16	<ul><li>Do you see that?</li><li>A. Okay.</li><li>Q. You see that it says that; right?</li><li>A. I see that it says that, yes.</li></ul>
14 15 16 17	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER	13 14 15 16 17	<ul><li>Do you see that?</li><li>A. Okay.</li><li>Q. You see that it says that; right?</li><li>A. I see that it says that, yes.</li><li>Q. Okay. And it says that the slug</li></ul>
14 15 16 17 18	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS:	13 14 15 16 17 18	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems
14 15 16 17 18 19	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you	13 14 15 16 17 18 19	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading
14 15 16 17 18 19 20	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you haven't had any substantive conversations with	13 14 15 16 17 18 19 20	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading applications.
14 15 16 17 18 19 20 21	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you haven't had any substantive conversations with counsel?	13 14 15 16 17 18 19 20 21	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading applications. Do you see that?
14 15 16 17 18 19 20 21 22	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you haven't had any substantive conversations with counsel? A. That's correct.	13 14 15 16 17 18 19 20 21 22	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading applications. Do you see that? A. I do.
14 15 16 17 18 19 20 21 22 23	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you haven't had any substantive conversations with counsel? A. That's correct. Q. Okay. Between the time we started	13 14 15 16 17 18 19 20 21 22 23	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading applications. Do you see that? A. I do. Q. Okay. And loading/unloading
14 15 16 17 18 19 20 21 22 23 24	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you haven't had any substantive conversations with counsel? A. That's correct. Q. Okay. Between the time we started yesterday and now?	13 14 15 16 17 18 19 20 21 22 23 24	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading applications. Do you see that? A. I do. Q. Okay. And loading/unloading applications would include separate batches
14 15 16 17 18 19 20 21 22 23	called as a witness, having been first duly sworn by the Notary Public (Amy E. Sikora), was examined and testified as follows: EXAMINATION (Cont'd.) BY COUNSEL FOR THE PETITIONER BY MR. COSTAKOS: Q. So, Dr. Vipperman, I assume you haven't had any substantive conversations with counsel? A. That's correct. Q. Okay. Between the time we started	13 14 15 16 17 18 19 20 21 22 23	Do you see that? A. Okay. Q. You see that it says that; right? A. I see that it says that, yes. Q. Okay. And it says that the slug flow inhibit board is intended for use in systems susceptible to slug flow and on loading/unloading applications. Do you see that? A. I do. Q. Okay. And loading/unloading

			3 (Pages 102 to 105)
	Page 102		Page 104
1		1	minimize errors associated with this occurrence,
2	A. Right. So subject to my prior comments, that's true.	2	the board also monitors the signal-out voltage.
3	Q. Okay. And in this slug flow	3	If the signal-out voltage exceeds 3.5 volts, the
4	manual, it describes, under 2.0, principles of	4	board will inhibit the output of flow pulses.
5	operation, you'll see there's a second paragraph	5	And that's because the full-scale calibration of
6	there?	6	the meter corresponds to a voltage of 3.1 volts.
7	A. Okay.	7	So really we're monitoring the
8	Q. Okay. And there it's describing	8	voltage of the output board which presumably is
9	operation without the slug flow supplement where	9	high because, you know, the oscillation is
10	it says, "In some instances, when the flowmeter	10	unbalanced, at best, and lost all together, at
11	is filled with fluid from an initially empty	11	worst.
12	state, the vibrating U-tubes become unbalanced,	12	Q. Okay. You'll see what it does in
13	causing the flow rate indication to jump	13	the first paragraph under principles of operation
14	excessively high."	14	it says it monitors the density of the fluid in
15	You see that?	15	the sensor tube.
16	A. I see that.	16	You see that?
17	Q. Okay. So with the model D by	17	A. I see that.
18	itself, during the transition from empty to full,	18	Q. Okay. And so it monitors the
19	vibration of the U-tubes may become unbalanced;	19	density by monitoring the vibration of the flow
20	agree?	20	tube; right?
21	A. Well, I think that condition	21	A. So then it goes on to say,
22	occurs with the model D whether or not the slug	22	typically, fluid densities will range between .5
23	flow board is there, but but, yes, generally.	23	specific gravity and 3.0 specific gravity.
24	Q. So with or without the slug flow	24	However, gas densities are much less than .5
25	add-on, during the transition from empty to full,	25	specific gravity. Therefore, the board is
	Page 103		Page 105
1	-	1	
1	the vibrating U-tubes may become unbalanced?	1	normally set up to inhibit the output of flow
2	the vibrating U-tubes may become unbalanced? A. Right. So what we would have	2	normally set up to inhibit the output of flow pulses when the fluid density is less than .5
	<ul><li>the vibrating U-tubes may become unbalanced?</li><li>A. Right. So what we would have</li><li>there is a situation within an uncontrolled</li></ul>	2 3	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity.
2 3	<ul><li>the vibrating U-tubes may become unbalanced?</li><li>A. Right. So what we would have</li><li>there is a situation within an uncontrolled</li><li>vibration that's that could potentially be</li></ul>	2 3 4	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a
2 3 4	the vibrating U-tubes may become unbalanced? A. Right. So what we would have there is a situation within an uncontrolled vibration that's that could potentially be subject to stall, so	2 3	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being
2 3 4 5	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> </ul>	2 3 4 5	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the
2 3 4 5 6	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> </ul>	2 3 4 5 6	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the
2 3 4 5 6 7	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> </ul>	2 3 4 5 6 7	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter
2 3 4 5 6 7 8	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> </ul>	2 3 4 5 6 7 8	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the
2 3 4 5 6 7 8 9	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> <li>the output of pulses; right?</li> </ul>	2 3 4 5 6 7 8 9	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up.
2 3 4 5 6 7 8 9 10	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> <li>the output of pulses; right?</li> <li>A. Right. So the the model D has</li> </ul>	2 3 4 5 6 7 8 9 10	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds
2 3 4 5 6 7 8 9 10 11	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> <li>the output of pulses; right?</li> <li>A. Right. So the the model D has</li> <li>essentially lost oscillation and so the slug flow</li> </ul>	2 3 4 5 6 7 8 9 10 11	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds like it's it characterizes starting from an
2 3 4 5 6 7 8 9 10 11 12	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> <li>the output of pulses; right?</li> <li>A. Right. So the the model D has</li> </ul>	2 3 4 5 6 7 8 9 10 11 12	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds like it's it characterizes starting from an initially empty state and the tubes become
2 3 4 5 6 7 8 9 10 11 12 13	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> <li>the output of pulses; right?</li> <li>A. Right. So the the model D has</li> <li>essentially lost oscillation and so the slug flow</li> <li>board sees that it's producing a mass flow rate</li> </ul>	2 3 4 5 6 7 8 9 10 11 12 13	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds like it's it characterizes starting from an
2 3 4 5 6 7 8 9 10 11 12 13 14	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have</li> <li>there is a situation within an uncontrolled</li> <li>vibration that's that could potentially be</li> <li>subject to stall, so</li> <li>Q. Okay. And so what the slug flow</li> <li>inhibit board does is, when it detects such a</li> <li>condition, for example, during transitions from</li> <li>empty to full and full to empty, it will inhibit</li> <li>the output of pulses; right?</li> <li>A. Right. So the the model D has</li> <li>essentially lost oscillation and so the slug flow</li> <li>board sees that it's producing a mass flow rate</li> <li>that's excessively high, you know, beyond the</li> </ul>	2 3 4 5 6 7 8 9 10 11 12 13 14	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds like it's it characterizes starting from an initially empty state and the tubes become unbalanced, so this is the part where I was
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2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have there is a situation within an uncontrolled vibration that's that could potentially be subject to stall, so</li> <li>Q. Okay. And so what the slug flow inhibit board does is, when it detects such a condition, for example, during transitions from empty to full and full to empty, it will inhibit the output of pulses; right?</li> <li>A. Right. So the the model D has essentially lost oscillation and so the slug flow board sees that it's producing a mass flow rate that's excessively high, you know, beyond the capability of the meter, and it will kick in and inhibit the the measurement output or right.</li> <li>Q. And it detects that the readings are excessively high by monitoring the vibration of the flow tubes; right?</li> <li>A. Well, in the paragraph you were just in it says, to minimize errors well, starting back a sentence further, it talks about the U-tubes becoming unbalanced causing the flow</li> </ul>	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds like it's it characterizes starting from an initially empty state and the tubes become unbalanced, so this is the part where I was talking about before where it's monitoring the signal-out voltage and it would correspond an empty to full transition. Q. Okay. So the slug flow inhibit board monitors the density of the fluid by monitoring the vibration of the flow tube; right? A. That's true, subject to the my previous qual qualifications. Q. The density is a function of the frequency of the oscillation of the flow tube?
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	<ul> <li>the vibrating U-tubes may become unbalanced?</li> <li>A. Right. So what we would have there is a situation within an uncontrolled vibration that's that could potentially be subject to stall, so</li> <li>Q. Okay. And so what the slug flow inhibit board does is, when it detects such a condition, for example, during transitions from empty to full and full to empty, it will inhibit the output of pulses; right?</li> <li>A. Right. So the the model D has essentially lost oscillation and so the slug flow board sees that it's producing a mass flow rate that's excessively high, you know, beyond the capability of the meter, and it will kick in and inhibit the the measurement output or right.</li> <li>Q. And it detects that the readings are excessively high by monitoring the vibration of the flow tubes; right?</li> <li>A. Well, in the paragraph you were just in it says, to minimize errors well, starting back a sentence further, it talks about</li> </ul>	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	normally set up to inhibit the output of flow pulses when the fluid density is less than .5 standard gravity. So this sounds to me like it's a transition from full to empty. And it's being sounds like it's being very proactive, and if the specific gravity drops below .5, it inhibits the pulses so that there's no output of the meter because, you know, the tough part of the transition is coming up. Where the next paragraph sounds like it's it characterizes starting from an initially empty state and the tubes become unbalanced, so this is the part where I was talking about before where it's monitoring the signal-out voltage and it would correspond an empty to full transition. Q. Okay. So the slug flow inhibit board monitors the density of the fluid by monitoring the vibration of the flow tube; right? A. That's true, subject to the my previous qual qualifications. Q. The density is a function of the

4 (Pages 106 to 109)

			4 (Pages 106 to 109)
	Page 106		Page 108
1	qualifications.	1	A. It would be at least it would
2	Q. So what the slug flow inhibit	2	be it would be one batch.
3	board does is, if the density that is detected by	3	Q. It would at least be one batch;
4	monitoring the vibration of the flow tubes falls	4	agree?
5	below .5 specific gravity, it will inhibit the	5	A. I think the system's designed to
6	output of pulses?	6	do a batch at a time, when you consider the steps
7	A. Right. So again, since the fluids	7	one through five that are down below there.
8	can have specific gravities that are higher, say,	8	So
9	between .5 and 3.0, then it knows that if it	9	Q. But unloading
10	drops below .5 we're going from a full to empty	10	MR. COSTAKOS: Strike that.
11	transition and it would inhibit the pulses.	11	Q. But loading/unloading relates to a
12	Q. Likewise, if the flow tube were	12	batch; agree?
13	were simply empty, it would inhibit the output of	13	A. I would consider one or the other
14	pulses; right?	14	to be a batch, and perhaps I I would
15	A. Perhaps. My impression with this	15	consider one or the other, either loading or
16	meter is that you just run a single batch at a	16	unloading, to be a batch.
17	time.	17	Q. Okay. You mentioned before the
18	Q. Right. My question, though, was	18	steps one through five. You'll see under step
19	if the meter were empty, so just filled with gas,	19	five it says, the amount of time required before
20	then the specific gravity would be below .5 and	20	the downstream valve can be fully opened is
21	the inhibit board would inhibit the output of	21	typically less than two minutes.
22	flow pulses?	22	Do you see that?
23	A. Perhaps. I don't see where it	23	A. Yes.
24	says, but that seems like it could be true.	24	Q. So the transition from empty to
25	Q. If you look at page five of the	25	full is on the order of two minutes or less; is
1 2	Page 107 document, beneath the part that says table 2. Do you see that?	1 2	Page 109 that fair? A. Well, if we if we back up to
3	A. Uh-huh.	3	step two, we're instructed, close the upstream
4	Q. Okay. You see in the first	4	valve. And step three we open the downstream
5	sentence under there it says that new switch	5	valve to allow one quarter or less of the normal
6	settings can be calculated if a specific gravity	6	fluid flow. This will minimize the amount of
7	inhibit point other than 0.5 SG is desired	7	fluid missed at start-up, which is the the
8	A. Yes.	8	issue at hand that shows that this setup does not
9	Q end quote.	9	maintain oscillation because we're missing fluid.
10	Do you see that?	10	Then we slowly open in step
11	A. Yes.	11	four, we slowly open the upstream valve to force
12	Q. So the inhibit point is adjustable	12	the air out and slowly fill the meter. This slow
13	by the user?	13	opening minimizes the shock to the meter and
14	A. Yes. So it seems.	14	reduces recovery time, again suggesting that this
15	Q. On page two excuse me,	15	combination has trouble maintaining oscillation
16	page three of the document, it has a 3 in the	16	through the transition.
17	middle and a 2 over on the right-hand of the	17	And then it says, in step five,
18	page. It says, "Loading/Unloading." Okay.	18	once it begins counting in a normal manner,
19 20	It says that if the board is going	19	slowly open the downstream valve until it's fully
20	to be used in a loading and unloading	20	open.
22	application.	21	So it sounds like the transition
22	Do you see that up at the top? A. I do.	22	from empty to full has already occurred at at
23		23	step four because we slowly force the air out.
25	Q. That is a batching application; right?	24	Q. Okay. So the recommended
20	11511t:	25	procedure in steps one through five is to slowly

			5 (Pages 110 to 113)
	Page 110		Page 112
1	fill the flowmeter with fluid?	1	Q. Right. My question was that the
2	A. Correct. To minimize the shock	2	Q. Right. My question was that the way it would work is that you would run this
3	and reduce recovery time.	3	single run, as you described it, and then, as
4	Q. Okay. So the transition from	4	described in that sentence that I just read to
5	empty to full in this recommended procedure will	5	you, the meter would be purged of liquid at the
6	be done slowly to minimize the shock and reduce	6	end of the run; correct?
7	recovery time?	7	A. Correct.
8	MR. JOHNSON: Objection, form.	8	MR. JOHNSON: Objection, form.
9	A. Can you please repeat the	9	Q. And then the meter would be able
10	question.	10	to process another batch; correct?
11	MR. COSTAKOS: Can you read it	11	MR. JOHNSON: Objection, form.
12	back, please.	12	A. Are are you asking me if that's
13	(Record read.)	13	what you're reading from the sentence?
14	A. Okay. So I think back to the	14	Q. I'm asking you if that's how this
15	passage we read that talked about filling the	15	meter would work.
16	flow tubes causing an unbalanced vibration	16	MR. JOHNSON: Objection, form.
17	condition, and I think that relates here, because	17	Objection, scope.
18	in step three we're talking about minimizing the	18	Q. Let me ask it let me ask it
19	fluid missed on start-up, and then in step four	19	this way: This section here describes loading
20	we're talking about the slow transition from	20	and unloading applications; right?
21	empty to full to reduce the shock to the meter	21	A. Yes.
22	and reduce the recovery time because, again, it's	22	Q. Okay. And it describes a
23	not maintaining oscillation.	23	procedure which we've just walked through for
24 25	And so when we reduce the recovery	24 25	processing a single batch; correct?
20	time, we're also minimizing the amount of fluid	2.5	A. Yes.
	Page 111		Page 113
1	-	1	_
1 2	missed on start-up in step three.	1 2	Page 113 Q. Okay. And then it says that the meter is purged of liquid at the end of the run;
	missed on start-up in step three.		Q. Okay. And then it says that the
2	missed on start-up in step three. Q. So you said before that your view	2	Q. Okay. And then it says that the meter is purged of liquid at the end of the run;
2 3	<ul><li>missed on start-up in step three.</li><li>Q. So you said before that your view was that this procedure related to separate</li></ul>	2 3	Q. Okay. And then it says that the meter is purged of liquid at the end of the run; correct?
2 3 4	missed on start-up in step three. Q. So you said before that your view was that this procedure related to separate batches?	2 3 4	<ul><li>Q. Okay. And then it says that the meter is purged of liquid at the end of the run; correct?</li><li>A. The sentence one says that, yes.</li></ul>
2 3 4 5	missed on start-up in step three. Q. So you said before that your view was that this procedure related to separate batches? A. Yes.	2 3 4 5	<ul><li>Q. Okay. And then it says that the meter is purged of liquid at the end of the run; correct?</li><li>A. The sentence one says that, yes.</li><li>Q. Okay. And then the meter could be</li></ul>
2 3 4 5 6	<ul> <li>missed on start-up in step three.</li> <li>Q. So you said before that your view was that this procedure related to separate batches?</li> <li>A. Yes.</li> <li>Q. Or a batch at a time I think is the way characterized it; is that fair?</li> <li>A. Yes.</li> </ul>	2 3 4 5 6	<ul><li>Q. Okay. And then it says that the meter is purged of liquid at the end of the run; correct?</li><li>A. The sentence one says that, yes.</li><li>Q. Okay. And then the meter could be used after the meter has been purged of liquid at the end of the run to process a second batch using the same procedure; right?</li></ul>
2 3 4 5 6 7 8 9	<ul> <li>missed on start-up in step three.</li> <li>Q. So you said before that your view was that this procedure related to separate batches?</li> <li>A. Yes.</li> <li>Q. Or a batch at a time I think is the way characterized it; is that fair?</li> <li>A. Yes.</li> <li>Q. Okay. And if you look on the</li> </ul>	2 3 4 5 6 7 8 9	<ul> <li>Q. Okay. And then it says that the meter is purged of liquid at the end of the run; correct?</li> <li>A. The sentence one says that, yes.</li> <li>Q. Okay. And then the meter could be used after the meter has been purged of liquid at the end of the run to process a second batch using the same procedure; right?</li> <li>MR. JOHNSON: Objection, form.</li> </ul>
2 3 4 5 6 7 8 9 10	<ul> <li>missed on start-up in step three.</li> <li>Q. So you said before that your view was that this procedure related to separate batches?</li> <li>A. Yes.</li> <li>Q. Or a batch at a time I think is the way characterized it; is that fair?</li> <li>A. Yes.</li> <li>Q. Okay. And if you look on the second paragraph on this page, it says, "In</li> </ul>	2 3 4 5 6 7 8 9 10	<ul> <li>Q. Okay. And then it says that the meter is purged of liquid at the end of the run; correct?</li> <li>A. The sentence one says that, yes.</li> <li>Q. Okay. And then the meter could be used after the meter has been purged of liquid at the end of the run to process a second batch using the same procedure; right? MR. JOHNSON: Objection, form.</li> <li>Objection, scope.</li> </ul>
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## DOCKET A L A R M



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