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Company Affiliations: Saskatchewan Wheat Pool

Interview Date: 30 August 2012

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Summary: In his second interview, millwright and grain cleaning and processing consultant Joe Igneczi goes into detail about how carloads of grain are cleaned in a terminal grain elevator. He describes the two main types of cleaners—indent cylinders and screen machines—and how each is used to separate out different sizes of dockage from the clean, good grain. He follows a carload of wheat through the elevator from unloading to binning to loading onto a ship. He discusses how different products like malt barley are handled differently. Other topics discussed include different storage bins through the elevator, dust control and the elevator bag house, the byproduct reclaim system, Canada's global reputation for clean grain, repairing and overhauling grain machines, and being part of the Saskatchewan Wheat Pool engineering department.

Keywords: Saskatchewan Wheat Pool; Thunder Bay terminal grain elevators; Grain elevators—Equipment and supplies; Grain cleaning; Grain cleaning machines; Indent cylinder grain cleaners; Screen-type grain cleaners; Grain dockage; Grain screenings; Grain dust; Dust control; Grain elevator storage; Grain elevator bag house; Aspirator systems; Superior grain cleaners; BM&M grain cleaners; Monitor grain cleaners; Grain grading; Grain inspection; Grain sampling; Canadian Grain Commission; Grain transportation—ship

Time, Speaker, Narrative
NP: This is a continuation of an interview done earlier this month, and today's date is August the 30th, and once again conducting the interview with Joe Igneczi at his residence on Hilldale Road. We're going to continue with what we covered just very briefly in the last interview, and that is to go into some detail about the actual cleaning equipment in the elevator because Joe was very involved in that, and in fact has written some manuals related to it, and I'd like him to talk about those as well. If it's okay with you, Mr. Igneczi, perhaps we'll just start with top to bottom the cleaning work that goes on in an elevator.

JI: Well, when it comes to grain cleaning, everything hinges on the cleaning machines, and everything hinges on the indent cylinder cleaners. Those cleaners, they can be found whether it is an old elevator or a new elevator. The basis of cleaning is the Superior indent cylinder cleaners and the different flow of the grain through those cylinders in the cleaner machines.

NP: So what is the underlying physics—if that's the right term—of the Superior? And I'm assuming that's the brand name.

JI: That's the brand name. Well, it was manufactured, and it was distributed by Northland Machinery in those days, the Superior cylinder cleaners. The other type is the Uniflow cylinder cleaners. They are pretty well the same. The Uniflows are slightly smaller cylinders. Superiors are bigger cylinders, but the indent has to be the same in order to make the same separation.

NP: Now what do you mean the indent is the same?

JI: Every--.

NP: Can I--? **[Audio pauses]** And we re-grouped. Starting up the interview again. We took a pause just to try to get some order to what our discussion was going to be because it's quite a complex system, but I think that Joe will be able to present it in general terms. It gives us an idea of the cleaning system. I'm going to ask some questions that introduce the parts of the system, and then Joe will discuss how the system works. We ended off, I think, the last little bit of this part of the interview with just talking about the types of cylinder-type systems that were used. There were a couple of brand names mentioned, and I was just wondering where they were manufactured. So perhaps you should comment on that.

JI: Well, I really don't know exactly. They manufacture it in Canada, they manufacture it in the States, but it's quite a process to manufacture the indent cylinders. There are different types of indents. Of course, No. 20, No. 25, No. 19, 18—they're all different. And the numbers mean that--. Let's say a No. 20 indent is $20/64^{th}$ of an inch, the width of the indent. Just to comment on the indent cylinders that they are, as far as I know, they are manufactured in Canada and in the States. Like when we dealt with Northland Machinery, they were doing it here. Simon Day or Daycon, they were getting it probably from the States. So they manufactured it in different places.

NP: Now the general description of the interior of a cylinder then. We'll have a picture to go along with this but describe the interior of a cylinder system.

[0:05:08]

JI: Well, the system is designed to have a little indent on the inside of the cylinder, and there are—well, a little indent, indentation—there are thousands of indents on the cylinder. Of course, they go through the process of case hardened, heated, and case hardened, in order to last at least three, three and a half years before we have to take it out and replace it with another one.

NP: So the cylinder then, the exterior of the cylinder and the machine, the cylinder itself would be about what diameter?

JI: Well, the cylinder, it depends on where the cylinder is. Like the splitting cylinders, the very first row on the top right under the aspirator, they are 26 inches in diameter. Some are smaller ones depending on what position they are. But when we are talking about the primary cylinder cleaners, if we say a CC-12, which stands for Cylinder Cleaner 12, that means it has 12 cylinders inside that machine—12 cylinders and an aspirator on the top, and the different types of conveying systems on the front of the machine and below. Now, as the grain goes through the aspiration and enters the cylinders, the cylinders do not make the final cleaning. The cylinders only divide the load into shorter and longer product.

NP: Okay. Before you go onto that, just to finish it off the description of the cylinder. So it's a round machine with dimples essentially all around--.

JI: Okay. Inside the cylinder.

NP: All around the circumference of the cylinder.

JI: Yes, yes.

NP: And through the centre of it?

JI: Well, through the centre of it because the cylinder makes two separations—liftings and tailings—when the cylinder is turning, there is a trough inside the cylinder that doesn't touch the cylinder. It's inside and the little things will be deposited into the trough.

NP: Now when you talk about liftings and--.

JI: And tailings.

NP: What are those? Oh--.

JI: This is the trough with a conveyor in it. Whatever the cylinder deposits in there, throws in there, will be discharged at one end.

NP: Through an auger.

JI: With an auger. We always call it screw conveyors.

NP: Okay.

JI: Okay. It's an auger, a screw conveyor. Now, cylinder, in order to make that proper separation, take the shorter and lift it into the trough, and tail the longer, reject the longer. And underneath the troughs, again, there are some deflectors that, as they cylinder turns, the tailings will be pushed to the other end of the--. You know, it will come out at the end of the cylinder. So nothing will stay there. It's always in movement. Seeds and everything, everything is moving. Now to accomplish the separation, the cylinder has to have a certain amount of speed, and with the speed, we're creating a centrifugal force. That's how the seeds will stay in the indents and be lifted to a certain point where—this is a little technical—where the gravitational force is going to be stronger. It will overcome the centrifugal force. So whatever is lifted to a certain height will be dropped into the trough, and because of the longer seeds—like the wild oats or straw or some longer products that do not fit into the indents—it will never get lifted. Because it's not sitting in the indents, there is no centrifugal force to hold them in there because they're longer. So they just fall out. They accumulate on the bottom of the cylinder and will be discharged, as we call it, tailings. The liftings, the shorter, will be, again, discharged with the conveyor.

[0:10:13]

NP: Now, the other type of cleaning apparatus were the screen types. So can you tell us about what those are and where they'll be found?

JI: Well, we have--.

NP: What they're used for and where they'll be found.

JI: Well, the screen-type cylinders are something else. We have three--. The cylinders three high because we have to lift things and the tailing in the top row of cylinders. In the top row of cylinders, the splitting cylinders. We have the liftings and tailings. So the liftings are the shorter material will be spouted to the centre row of cylinders—this is a CC-12—to the centre row, and the tailings, the longer material—oats, wild oats, and wheat heads and things like that and straw—will go down to the lower cylinders. Now,

these are the two cylinders, again, where we'll make the two separations, the longer and shorter. The top row of cylinders are probably a No. 20 indent. The centre is a No. 10 indent. So when you look at the liftings from the splitting cylinder, that is your full kernel of wheat, the broken wheat, and the shorter material that fit into the indents in the top row. So we'll be down now from the 20 indent, we'll go down to the 10 indent. On the 10 indent, this is the seed cylinder, seed row. The 10 indent is, again, like half the size, and it will only lift the fine seeds like canola, very fine wheat seeds, something like that. And we lift the good grain out of the mixture. Or tail the good grain out of the mixture. The seeds will be lifted because the 10 indent only lifts the small seeds.

NP: And the tailings from that particular cylinder?

JI: This one will be the good grain, and that will go into an annex bin. It will go into the annex bin. Now the oat row cylinders, 18 or 20 indents, again--.

NP: That's the third row that you mentioned there.

JI: The third row on the bottom, again, now we are--. Because in the tailings from the splitting cylinder you're still going to have some wheat going down there because we're just dividing the load here, some wheat will go down there. But the No. 18 and the No. 20 cylinder—20 indent—will lift the wheat and tail the wild oats and the roughage that we don't want. So here the tailings will go as a good grain, and the bottom will be the liftings because of the different indent sizes.

NP: Okay. Now just the other type of cleaning machine because I would like to go back to talk about the different types of bins.

JI: The screen-type machines.

NP: Because that will depend on where the various products from these cylinders will go. So the other type of cleaners, the non-cylinder ones, are called--?

JI: Screen-type cleaners.

NP: Where do you find those in the elevator?

JI: Well, usually when we lift the seed cylinders, the No. 10 indent will lift the fine seeds, the canola, because that's all that will fit into the little indents. Now that will go to the reclaim system. On the reclaim system, we will have, again, the screen-type machines but also the seed cylinders.

NP: So what determines whether you're using a screen system versus a cylinder system? And a screen is just what it says. It's just like a window screen turned flat.

JI: There are different types of screens. Well, not necessarily flat. There has to be a little angle so that when you put the grain on, it will be moving, and the machine will have like sometimes clockwise or counterclockwise. So it goes into a rotary motion, and with the angle sloping down to the discharge end, and the shaking moment, that will shake the very fine seeds out of the mixture depending on what sieves openings you have on the screen.

[0:15:35]

NP: And what kinds of sieve openings are there?

JI: Well, there are many.

NP: Pick a couple of major ones that are used.

JI: A couple ones? I had it here. I think it's No. 5 and a half or No. 6 box sieves on the top. Underneath, you're going to have a No. 4 and a half sieve, round hole sieve, and whatever falls through is just dockage.

NP: So the screens are designed, then, to go with the products you want to fall through? Or not fall through?

JI: The sieves are, again, designed to separate the product that we want to save or send the other products into the refuse bin where we're going to send it to the pellet plant.

NP: Okay, good. So is it fair to call the screen cleaning system the secondary system?

JI: Well, sometimes the reclaim system is called the secondary or by-product system, yes. So that's the same thing.

NP: What I want to talk about before we follow a load of product from a grain car through the system, is I'd like you to talk about the different types of bins in the elevator and where they are and why they're there.

JI: We have the--. Well, the very first thing, we have to look at the workhouse. When we receive the cars in the car shed, unload it—whether it's dumper or tanker cars that just have to open the slide and it flows on the conveyor belt—when the grain is collected in the car shed on the conveyor belt, it goes into the receiving legs. The receiving legs are usually bigger than the shipping legs in most houses because they like to unload the cars quicker. The receiving legs are usually--. Somehow, it's distinguished either by a different type of colour or the size that it's bigger than the shipping legs, but when you go up on the scale floor, you see that, "Okay, that's a receiver scale. That's a shipping scale." So you know those things already just by sight. When the car comes up to the top floor, the bucket elevators, they take the grain up to the top floor and dump it into a garner. The garner is like probably 50-60 tonnes, more than half the size of a tanker.

NP: Yeah. If we could just step back a minute and just deal with the different types of bins and how they're configured.

JI: Okay. That's what I was heading to. From the receiving leg, it goes into the garner, and from the garner, always goes into the scale. They weigh it, and once the grain is weighed, they put it into house bins. House bins, they are—don't quote me on this or don't hold me to it [laughs]—but in the old days, it was like three or four boxcars, but today you might put into it a couple tankers in there. So the house bins are smaller in size.

[0:20:13]

NP: Smaller in size than--?

JI: Compared to the annex bins. The annex bins, now, they are huge. So from the house bins, the reason for the size is because underneath the house bins you will find the cleaner deck, and on the cleaner deck you're going to have the hoppers, the spoutings that feed the cleaner machines. So you need space for that, so that always takes up quite a bit of space. So the house bins have to be much smaller.

NP: Okay. Now, in the house bins then, if I'm interpreting what you said properly, the house bins are not as deep as the annex bins. The annex bins are almost top to bottom storage.

JI: Top to bottom, yes.

NP: Okay. Now, in the house bins then, you have the receiving bins where they're temporary storage for the grain before it's cleaned?

JI: Yeah. The house bins are designated as house bins, and what we understand that's where--. They are the receiving bins, most of them.

NP: Okay. And what are the other bins in the house?

JI: There are some other bins like things getting in there, like broken grain and the dockage coming up from the basement on we call it a screening leg. One screening leg that goes up again to the by-product system, and the by-product system is usually located on the same floor as we have the scales, garners, and up in the workhouse.

NP: What if you had a shipment in that had bugs in it or some kind of fungus in it or whatever?

JI: We always had to put it into--. When we found it, it had to be marked and put into a special—it's not a special bin—but into a separate--. How should I--?

NP: Holding area, essentially?

JI: A holding area where we will not put anymore grain into that bin. It has to be fumigated, and then there has to be a seal put on it for certain number of days.

NP: Would that be usually in a house bin, or would it be more likely to be held in the annex?

JI: You find them in many places because sometimes we find out too late, and it's in the house bin. So we segregate. That's the word I was looking for. Segregate that bin and lock it, seal it, in the house bin. But there are times when we do quite a bit and that is in the annex. When it spreads—and it spreads often quite quickly—then we have to fumigate sometimes the whole annex.

NP: Now, is there ever a situation where grain would be transferred to the annex without being cleaned?

JI: There are some times, yes, because the machines may break down or electrical problems or cleaner leg problems. Every set of cleaners have their own cleaner legs. Like we have the receiver legs, shipping legs, cleaner legs, and then the by-product legs, so there are a lot of equipment in the basement, and the conveyor belts, and all of that.

NP: So they may have to handle it twice, taking it out to the annex and taking it back in to clean.

JI: Yes, that can happen. Sometimes if some things breakdown and we have to fix the machines, so we shut down that set, and there is just no way to get away from it. They have to put some dirty grain into the annex.

NP: But the ideal is to have clean grain in the annex.

JI: It's always we try to do that. We try to clean it before it gets into the storage bins, the annex bins.

NP: Now, you're going to be describing in just a little bit the system that the grain will go from start to end, but in our little off-tape discussion, you mentioned the aspirator system. Are there bins that hold the by-product of that, and if so, where are they?

[0:25:13]

JI: Yes. When the grain comes in, and it goes through the process of weighed off on the scales, and it's put into the house bins and then to the cleaner machines, every cleaner machine has an aspirator system on it.

NP: And what is an aspirator system?

JI: An aspirator system, it has a certain amount of air like wind. It blows out the chaff, the dust, and maybe the fine seeds also. The aspirator system is connected to those bag houses. In the old days, it was cyclones, and you'd see all that dust flying out into the air above the elevators. Today, nowadays, you don't see it for quite a few years now because we have the bag houses. Every aspirator is hooked up to a dust control system that brings all that fine dust and fine seeds into the bag house, and there it will, again, under the bag houses you'll have a conveying system that will collect these finer broken grain or the skin of the kernel and things like that.

NP: Yeah. What is a bag house?

JI: Oh, gosh. [Laughs]

NP: Is it a house or just like a housing, like a feed bag?

JI: No, the bag house is--. Most of the time you will find the bag houses—that's how we call them—on the top of the car shed. And if you ever look up on the car shed, you're going to see these huge rectangular shape, almost like boxes, and the boxes, they can be

like 20 feet by 20 feet by 30 feet high because there are these dust bags hanging inside that when you blow the fine seeds and the dust and the little particles in there, well, it cannot go through the bag.

NP: It's like a vacuum cleaner bag?

JI: Like a vacuum cleaner bag, only the air will go through it, and the bigger particles will drop down and get collected. It will go to the refuse bin, and from the refuse bin will go to the pellet plant.

NP: Now, with the bag houses, so the bag houses means it's a house for a bunch of bags--.

JI: Well, it's a big, huge construction with bags and screw conveyors underneath, and again the air is coming out at another point.

NP: Does the bag that is trapping the dust and small particles, does it automatically empty? It is constantly emptying or does somebody have to go and clean them out like a vacuum cleaner bag?

JI: No, you don't clean that out. It's already designed that it's on, like a vacuum bag, on a wire cage. In one of those big construction, in those big boxes, steel or galvanized steel boxes, you may find 100 or 200 of these bags. I don't know how to compare it, but they may be about 15--. Not 15. Maybe about a square 8-by-8-inch steel frame, like wire frame. When they wear out or it has to be replaced, the millwrights usually do that. But there are hundreds of those bags in those houses. And the reason they are in there is so the dust and the dirt won't fly in the air against pollution. We don't want that flying in the air.

NP: So when some elevators were closed down in the '80s or even sooner, it was because this whole aspiration system was very expensive.

[0:30:12]

JI: They had no dust control system. They--.

NP: Except the cyclones.

JI: They hardly had a few cyclones. Like I remember up the river, the old Fort William elevators, they didn't have anything, so it was cheaper to tear them down. Also, the boats, you know, the big lakers, they didn't go up the river anymore because it just wasn't

deep enough for those boats. So that's what eliminated most of those elevators up on the river. It wasn't, how do you say, to navigate up there?

NP: Navigable.

JI: Yes. So we just left them alone. There is still one elevator there that is still working, but it usually transfers products coming in, and they are smaller amounts—two or three cars. Well, it's like a one-man operation there. They survived that way.

NP: Yeah. The Western By-Products, yeah.

JI: Yes.

NP: Okay. Well, taking a very complicated system, you did a good job of clarifying it. We've got the types of bins that you're going to find, where you're going to find them, the types of cleaners in general that are in use, the aspiration system, which is part of the cleaning system but also--.

JI: Oh, definitely part of the cleaners.

NP: But also, very much part of the safety system.

JI: It's safety and part of the cleaning system. Yes, it's a major part of the operation because we certainly cannot put all the dust and the dirt out in the air. We can't pollute.

NP: But at the end of the day, having all these pieces put together, all of the components, there's very little tossed away. So what I'd like you to talk about now is let's assume that we have a boxcar or hopper car of--. What makes the most interesting story? Does it matter if we say wheat or if I say oats coming in?

JI: Well, I would say 90 percent of the time, and I don't know if I'm close to the truth—I think I'm close to it—but 90 percent of the time, we handle wheat in here in Thunder Bay.

NP: Yeah. Would there be any kind of product that wouldn't go through the usual system, or does it pretty much all go through the system whether it's canola or wheat or oats?

JI: Well, they go through the system. Everything goes through the system because it's designed. Like the grain elevators, they will handle everything and anything. If you go to a malt barley elevator, now, they only handle malt barley, and they're very touchy. They're very specific about things. I remember once we were loading a boat for some companies from the west. They sent down the malt barley, and the government guys were there, the inspectors, and everybody was watching, and so did the company. The company who handled that malt barley was following it all the way, including in one of the elevators. When we were unloading it, this representative from the company just walked into the cleaner deck, and there was this guy. He was eating sunflower seeds and spitting left and right and things like that. The fellow stopped everything. Stopped everything and, "Get that guy out of here, and get the sunflower seeds and everything," because he didn't want--. If you would throw a handful of sunflower seeds into a boatload of malt barley, they will not accept it. At the other end when they start inspecting the product, and if they find sunflower seeds or oilseeds in it, that's not going to be a malt barley anymore. So it's downgraded big time.

[0:35:16]

Quickly, the reason for that is—it's very simple—when you're drinking beer, there is a nice bubbly foam on the top. If any kind of oil, a drop of oil, gets in there, there isn't going to be any foam. It's not going to look like beer. It's not going to sell. And that is the bottom of everything. No oilseeds in malt barley, so they do handle malt barley very, very carefully and watch all the way. It's completely different from grain.

NP: So when we come to talk about the dockage system and reintroducing dockage to hit a certain level, that certainly wouldn't be happening with barley.

JI: No, not at all. No, no. Barley is a different picture, and it's graded differently. Malt barley is completely different from grain.

NP: So let's take wheat as our example. Our hopper car comes in and take it through the whole cleaning process.

JI: Well, the very first thing is that when we unload whether a boxcar or hopper cars—the tankers now we call them—it goes--. As we're downloading it, we call the receiving belt—conveyor belt coming in from the car shed—before it hits the elevating leg, there is a sampler system. It's an automatic sample system. Tiny little scoops on the chain going continuously in the grain flow.

NP: The Woodside sampler system, automatic sampler.

JI: Well, that was a long time ago.

NP: And invented by somebody from Thunder Bay.

JI: I don't know if it was invented here.

NP: Yeah.

JI: But it was very efficient, and we have our system, and the government has their system. So we take samples from it. The company inspectors check it, the government inspectors check it, and 99.99 percent of the time, the government inspectors will put the grade on it. So the receiving leg elevates the car of grain that came in. We got it out of the tankers, and it goes up to the garner up on the top floor, and underneath the garner we have the scales, the receiver scales. They are already--. It's a different gang, actually, does the weighing of the grain coming in, and a different gang for shipping. But when the grain comes in, we weigh it on the scale floor, and we put it into the house bins. Now, the house bins are much smaller in size than the annex storage bins, and that's because they only--. Well, underneath the house bins, we had to build the cleaner deck, and the cleaner deck, the cleaner machines, the smaller, shorter legs, and underneath the cleaner deck we've got the screw conveying system.

So the house bins are much smaller for that reason. They take up much smaller space also. Now, when it comes to cleaning, there are certain house bins that will feed certain cleaner machines. One cleaner set—we call it cleaner set—consists of four cylinder-type cleaners, like four CC-12 cleaner machines. Usually, that one cleaner set has maybe six, eight, or nine house bins that feed into those. And the reason for those six or eight or how many house bins is to keep the grades separately, because it could be [No.] 1 Red, could be [No.] 2 Red, and we cannot clean them at the same time. We have to maintain the grade and clean that way.

[0:40:37]

So when it gets to the cleaners, the first thing it will go through, every cleaner machine—like I mentioned the cleaner set has four machines—every cleaner machine has an aspirator on the top of it. It has to be adjusted by the operator depending on what he is cleaning. It has to be adjusted. The cylinder itself, the receiver trough, it has to be adjusted to a certain angle. So as the cylinder makes the dividing the shorter and the longer product, that you do not want to go too far down because you would be getting a certain amount of oats. So you raise the trough a little bit, a little higher, so all the longer ones will be tailed off and we're just lifting the wheat out of the mixture. So we're making the separations on the indent cylinder machines.

NP: If I've interpreted what you're saying then, there would be an operator in place while some cleaning is being done, and one of the tasks they would have to do was to know--.

JI: How to adjust the machine.

NP: The quality of the product that they're starting with and what kind of adjustments to make to deal with that.

JI: The adjustment is very important, and he's got to take samples. Usually, one man looks after two, sometimes three, sets. Three sets is 12 already, 12 machines.

NP: Did they set aside certain days to clean grain, or did they clean grain everyday?

JI: They cleaned the grain as it comes it. It don't make any difference winter, summer, day, or night. They clean grain all the time. Yeah. Something that's important, because when I was travelling the Prairies—I think I mentioned this before—they didn't know how the machine works. Like every single machine, every CC-12 or CC-16 or the B-25s, those machines, they have an aspirator on the top of it. Now, the aspirator requires a lot of air. Like a CC-12 machine, the aspirator will require about 5,000 cubic feet of air per minute, so that's a lot of air to go through that machine, the aspirator, to take the chaff and fine stuff out of there.

NP: So is that a fan system or--?

JI: It's a fan system. It's a suction system. It's generated on the car shed. We have those bag houses, and that's where they have the huge motors and fans to generate that suction that will suck—if I may use that word—the fine stuff out of the grain as it flows through.

NP: Now, thinking about that, if it's providing suction, you have to have makeup air, right? Is that just coming from the general elevator?

JI: It's just coming from outside. Just the outside air.

NP: Okay.

JI: Now, where was I?

NP: We're having our little grain--.

JI: The flow of the grain.

NP: The wheat in this case, coming through, and he's had to adjust.

JI: Now, it's very intricate—the screw conveying systems, the spoutings, the different flop valves underneath these machines—because when you have one type of product, you want to send it up on a certain, like--.

[Telephone rings]

[0:45:04]

NP: Sorry.

JI: So we send it up on a different leg. There are many ways. I showed some of the flop valves underneath the machines that you have, especially on the screen-type machines. You have three products coming down, two screens, but you've got the overs, and the next screen, and what falls through, so you've got three products coming. And it's not always going to go into the same screw conveying system or to the same elevating leg. We have the flop valves underneath.

NP: And the flop valves are just sort of like an open and close?

JI: Just to divert the load from one direction to another. So all these have to be learned and know what you're cleaning and where it has to go.

NP: So the flop valve then would, opened in one direction, would be taking it off to one bin, and--.

JI: Well, we're not at that stage yet.

NP: Okay.

JI: We're still working in the basement on the screw conveying system, the elevating legs, and so on. It's quite a job to learn it. Okay, we were at the grain goes through the cylinders. I mentioned this a few times that the cylinders only divide the load into longer and shorter, and whatever we are doing, the clean grain will go to the cleaning leg on the system. Like all the cleaner sets, the four machines, they have their own elevating leg that's usually half the size to the receiver legs, so much smaller. If we have

these bucket elevators, sometimes you have like 20 inch buckets on the screen or maybe 18 inch buckets on the elevating legs, but on the receiver legs, you have two side by side. So a receiver is the biggest one.

So each cleaner set has its own leg, and it gets elevated. Once it comes out of the cleaner machine as clean grain, that will be going to the storage tanks, into the annex tanks, the big ones. Those are huge tanks. You can have sometimes 10, 12 hopper cars in there in one of the big tanks, the big round tanks.

NP: Let's go back to our little load of grain that was coming in, our tanker. So it comes in, it gets elevated up, it goes quite often into a house bin. Well, it will have to go into a house bin.

JI: It has to go into the house bin. Cleaned.

NP: And then it starts its way through the cleaning system. So it passes through the aspirator into the cylinder system, and then from the cylinder system it just automatically goes into the screen system?

JI: From the cylinders, you're going to have clean grain coming, and you're going to have the by-products. Now when the clean grain comes from the cylinders, it will go into the clean leg, and that goes into the annex storage tanks. Now the other part that we call the tailings or the fine seeds, now that is going down to another screw conveyor, a complete screw conveying system from one end of the workhouse to the other because it has to pick up all the cleaner machines. Not just one set, but you may have five or six or eight. So it's huge, usually four or five screw conveyors, and they're all connected somehow into, usually, in the middle of the workhouse from the basement up we call it the screening leg. And that collects all the by-products from every set, and it takes it up to the, usually, on the scale floor. That's where you'll find the reclaim system. Reclaim or by-products or secondary. They've got many names and some companies use this name or that name. But it's all whatever we reject on the primary cleaners on the cleaner deck. It's not clean grain. It's not going to the annex. It will go to the reclaim system, but first it has to go into the screw conveyor system in the basement, gets collected, and it will go into the screening leg and up to the scale floor, garner floor, where we have the reclaim system.

[0:50:48]

Now, the reclaim system is quite complicated, and it starts, again, it starts with the aspirators. Sometimes we double aspirate on the reclaim system. First, we have a huge garner that holds a couple cars, and the first thing you find underneath that garner, or bin, is an aspirator, a big aspirator. Then underneath you have the machines, but the machine itself will have another aspirator. But these aspirators, again, are connected to the refuse bin, and the refuse bin is usually going to the pellet plant. So when we go through the

reclaim system, the purpose of the reclaim system is that when a car comes in and it's graded, "Okay, [No.] 1 Red," the [No.] 1 Red can only have very, very little dockage. But sometimes they come in with two, three, four—depends on the year sometimes—it could have even five percent dockage. If it comes in graded as two percent dockage, it's a rule of thumb that we remove double of the dockage percentage. If it's two percent, then we're going to remove at least four percent.

Now, in that four percent, we're going to have a lot of good grain that we have to reclaim from the reclaim system. That's what we do on the reclaim system. Actually, I never mentioned this, but we called the reclaim system or the by-product system the money makers. That's how they are called because in some cases, they may not be that efficient than others, but others may be more efficient, and they put a little more in than just what a load. So they call it money makers because that's all good money coming back to the company.

NP: So for example, is what you're saying this? That if you're loading something to be delivered, and you've got it cleaned really well, and you're loading it, that you want to be within the law related to the percentage.

JI: You have to.

NP: But at the same time, you don't want to not take advantage of being allowed some dockage.

JI: Well--.

NP: So you were talking previously about when you start shipping that wheat. So our little hopper car of wheat has gone into the annex to be mixed with the rest.

JI: Yes, yes.

NP: And now you're calling it forward.

JI: We're talking about money makers. Well, whatever we remove on the reclaim system—and usually broken grain—we can really separate the products that is grain, but it's not really like a [No.] 1 Red. If the government guys grade it, it's not going to be. But there is a certain limit of how much of the same type of broken grain you're allowed to dribble back in. Like from the reclaim system, whatever we remove and reclaim, that percentage that we would be losing otherwise, we put it into a separate bin in the annex. And when we are shipping, and if we are shipping the same grade, we're going to open up these bins that the broken grain or reclaimed from the reclaim system, and we just crack the--. When we are shipping, and a load is heading out to the--. Well, first

it has to go up to the scale floor and weighed off and all that. It will have a certain amount of broken grain dribbled back into that shipment. Whatever is allowed by the government.

NP: So, to put it crassly, the person who's buying the wheat then gets instead of a, let's say, 100 percent or as close to 100 percent clean grain—clean, full grain—is getting the allowed full grain and a bit of dockage.

JI: Well, I wouldn't call it dockage, but I would say that broken--.

NP: Reclaimed.

JI: Reclaimed broken grain, something like that. Something that we should be proud of in Canada that our grading system is probably the best in the world. Nobody pays that much attention to cleaning the grain and putting it on the market. That's why we were selling grain all over the world from Russia to China and everywhere because they can depend on when we say it's a [No.] 1 Red, it will be a [No.] 1 Red grade. We don't--. No, no. We definitely have a good name on the world market. Yes. And that's because we all abide by it, as far as I know anyways.

NP: Mmhmm. Well, one of the people I interviewed said that he was down, I think, it was in South America somewhere, and they were standing, and they were unloading two ships. One was just a cloud of dust, and the other was hardly any dust at all. The fellow from the country was saying to the Canadian who was visiting--.

JI: No dust.

NP: That's the Canadian shipment there. [Laughs]

JI: Yes. We're quite proud of that. Well, I'm a very, very small dot on the map. But I wonder what will happen—of course, this doesn't belong here—I wonder what will happen with the elimination of the Wheat Board because so far, like, the Wheat Board kept an eye on everything. So what will happen now? I don't know. That's for the younger generation. [Laughs] Yeah.

NP: Right, because they sold, largely, on this guarantee of quality.

JI: On the quality of the grain that was heading to the customers, yes. And who was policing it was the Wheat Board.

NP: And to a certain extent the Grain Commission. They worked very closely together, I guess.

JI: Yeah. Yes. Yes.

NP: Now, the last time in our other interview, you were talking about how you had helped design an improved cleaning system, which sped up the amount of time it took to clean the grain. Hm, where was I going with that?

JI: Well--.

NP: Sorry.

JI: I don't know if I would go into that.

NP: Well, you did last time. [Laughing]

JI: A little bit. Okay.

NP: Yes. So I think you've answered this question, but I'll ask it in any case. Oh, I did have one other question about the aspiration system.

JI: Okay.

NP: The part of the system that is on the cleaner floor right before it goes through the cylinder system, does that clog up? Or what kind of maintenance was required for that piece of the system? Does it wear out or--?

JI: Like the one above the cleaner machines?

NP: Yeah. Mmhmm.

JI: No problem there.

NP: No?

JI: No. It's just a spouting system and hoppers. Hoppers never wear out because there's no grain going through it that would fall and hit the side. It's just sliding, and it will last 15, 20 years.

NP: Now, the cylinder system then, the one with the little dimples in it all around the edge.

JI: Yes, indent cylinders.

NP: What kind of lifetime do they have?

JI: Three and a half to four, depending on the tonnage that you put through. But usually—I'm talking about Sask Pool elevators—the ones that were going year-round, three, three and a half years of life spent. Then you had to take them apart, replace the cylinders, usually the screw conveying systems, the bearings, and the certain things on that. Yes, it's very expensive. Even today if you have to overhaul one of the machines like a CC-12, you would be spending—depends on how it is worn out—oh, $60-70,000 on one machine. Big, big money. Big money.

[1:00:53]

NP: So that was a set or one machine?

JI: No, just one machine.

NP: Oh!

JI: One machine, yes.

NP: So an elevator then, was it the manager's responsibility to watch out for these capital costs and maintaining equipment? Or was there someone else in the elevator who made sure there was a systematic replacement system?

JI: Well, I also worked in the engineering department from '81 to '92, so I was responsible for ordering the parts, overhauling. Usually, the fellows they were working out in the elevators, they were very responsible, millwrights. We used to put the older ones, the older millwrights with a lot of experience in there, and they knew when one had to be overhauled. Or when the indents started to wear a little bit just on the edges of the dent, they knew that, "Okay, that can only go for another maybe six to eight months, and it will have to be overhauled." We tried to do the overhauls when the navigation stopped in wintertime. Yes, it was a responsible

job, and I sort of overlooked the overhauls in the different houses, Sask Wheat Pool houses, because I was millwrighting before, so I knew what was needed.

NP: I don't know if you're familiar with other systems around the world like our competitors—Australia, the US--.

JI: Don't know.

NP: Whether their cleaning systems were similar to ours.

JI: I only heard that they can't even come close to ours. Can't even come close to ours. Apparently, in most of those houses down in the States and even overseas, they don't have indent cylinders. They just have these huge screen-type machines, and the screen machines are not as precise as the cylinders. Yeah.

[Audio pauses]

NP: Got a buyout package or that it cost them hundreds of thousands of dollars.

JI: So with the cleaner system, we had to do a little bit of modification here and there. Probably when a screen-type machine came on the market, and we called it in those days the BM&M—I think I mentioned it before, the BM&M—and the Ruberg and Northland put out their own screen-type machine. These new, I have to emphasize, screen-type machines, they were different from the older ones. The older ones—the Monitors, S6 machines, Clippers, Clippens—they were all low-capacity machines, but they were essential, especially in the oilseed cleaning. These screen-type machines, you cannot do oilseed cleaning if you don't have screen machines because you have to remove the very fine weed seeds from the canola, flax, and the other oilseeds.

[1:05:11]

So when the new type of screen machines came on the market--. Like for example, the Monitor was probably the biggest in size in the old days, but it's cleaning capacity was maybe up to 500 bushels per hour, one machine. When the new type machines, the BM&M, and the other big machines came out, their cleaning capacity was five times the amount of what the Monitor or the other little machines were doing. So obviously we just had to pounce on it and put it to our good use. We did combine the screen-type machines with the cylinder machines because a certain part of the product that goes through the cylinders—as we mentioned when we discussed the indent cylinder machines—the cylinders, the top row of cylinders, they divide the load longer and shorter. If we put the liftings of the splitting cylinders, when we put that through the screens, we have the proper screen opening, the wheat got

separated right away from the little ones because it was a proper screen opening. So we accomplished quite a bit because it was almost like a one-pass. Once it went through the screen machine, the screen-type machines separated the seeds from the wheat, and that portion was clean. So that was really something.

Well, of course, there were other machines on the market, like Vancouver was trying the Ruberg that originated from Germany, but when it comes to length separation, the screen-type machines will not do the final job. It cannot do the final job. We found that out in Vancouver where there was actually five Ruberg on order, and eventually when we tried the one--. When it was set up in Vancouver, we tried one, and we just had to decline the other four because, again, it was excellent in separating the weed seeds, but it just could not separate the oats from the wheat because it was a screen machine. So we have to keep that in mind when we are talking about proper cleaning.

NP: Now, when we were having a little discussion off-tape, you had mentioned that Saskatchewan Wheat Pool actually had an engineering department here.

JI: In Thunder Bay.

NP: In Thunder Bay. So--.

JI: Yes. We had, of course, the engineering department here. It was in the old Clayton Building just across from the mall, Intercity Mall. We thrived, and we'd done quite a bit because in those days, that's when the big screen-type machines like the BM&M came into existence and on the market. So we started to rearrange our cleaning system, and we had to start installing those big machines that they were doing five times the amount of the Monitors or the other screen-type machines.

NP: And some of the people that worked there that you recall the names of the other engineering? Because at that point you had moved into the engineering--.

JI: Yes, at that time I worked in the engineering from '81 to '92. I recall Doug Stone. He was the head of the engineering department. Flavio Kempner. There were a few other ones like Ted Bushby and--. Well, there was about four or five of them that they had their papers. Beside that, we had the receptionist, and we had the head of the millwright department. I was the head of the grain cleaning and processing in the Sask Wheat Pool elevators. And yes, it was a thriving business. We also had, right next to the engineering department, we had the central maintenance shop. I looked after that. For a few years, we overhauled cleaner cylinders for Vancouver, actually. They sent their machine down, and we overhauled in the shop there, Intercity again, and sent it back to Vancouver. So it was a thriving business.

[1:10:55]

NP: So you were talking about the maintenance of the cylinders and the fact that they had to be replaced after a certain amount of time.

JI: Three and a half--.

NP: That was done by your staff?

JI: Three and a half, four years. Well, I wouldn't say my staff. I was responsible for the overhauls. I had to make up the budgets for different elevators and things like that, but the staff, they had their own millwrights in the elevators. Like when I was a millwright foreman at Pool 6 before that job, before the engineering department, I had 22 millwrights and seven oilers. In those days, we'd done everything and anything ourselves in the elevator. We didn't farm anything out. But today, today you just call in the contractors.

NP: So this refurbishing of the machines was done internally, usually?

JI: We'd done it ourselves, yes. Yes.

NP: I think I'd like to, well, first of all thank you for the great overview. I certainly have a much better understanding of the cleaning and processing system within the group.

JI: I think so.

NP: But I do have one question that we didn't sort of finish off with our--. We talked about the maintenance that was required on the cylinder systems. What about the screen systems?

JI: Well, the screen-types, again, it's quite complicated because it has too many little intricate parts. Depending on what you were cleaning, the top sieves were usually the box sieves—we called them box sieves, the triangular shaped sieves—and they wore out most of the time. These new machines, when they came out, when I was talking about the BM&Ms, it had a very different idea from the old screen-type machines. The Monitors I mentioned, those old machines, they were only going back and forth when they were shaking, moving the grain forward. And underneath to keep the openings, the sieve openings or the screen openings

underneath, they had a brush system that was brushing it so nothing would get stuck in it. Now, the new system, when the Burnaby came out, they had a good idea. Underneath the screens, they had these bouncing rubber balls and little cubicles under the screen. Three or four of those little balls the size of--. The cubicle as the page size, and three or four rubber balls bouncing underneath as the machine was going. The machine, it had a reciprocal and a rotary motion because they called them rotary screen cleaners. So they were going in a certain amount, they were going in like a rotary and back and forth. So obviously, you could put a lot more grain through it. It travelled faster. The seeds and everything fell through much quicker, and the bouncing rubber balls underneath, they kept the screens clean.

NP: How did the bouncing balls, how did they get bouncing? Was it just the action of the machine?

JI: There was actually a counterweight on where the motor was on the middle of the machine, and that's why it was making that shaking. There was a counterweight on the drive, and that made the shaking of the machine. When it started shaking, the balls were bouncing everywhere. So that was a good invention, and that's what made that machine so special. What else was there about the machines? Of course, I mentioned that at least five times more capacity going through than the old Monitors. Yes.

[1:15:43]

NP: Screens wear out?

JI: They wore out, but we didn't have to worry about it in the season. If it wore out, we kept an eye on it, and if it wasn't--. We saw the wearing on the screen, and we'd done it when navigation was closed. So for the next season, it was all refurbished, and we were going strong. Yeah.

NP: Okay.

JI: I think--.

NP: Did you keep one of those rubber balls as a souvenir?

JI: No, no.

NP: Are they still using them?

JI: Oh, yes. Of course, they do. Yes.

NP: That would be an intriguing, "What is this?" question.

JI: The size of the little balls are about an inch and a quarter in size. That's the size of bouncing rubber balls.

NP: Solid?

JI: Yes, quite, but still bouncy.

NP: Yes. But not hollow core?

JI: No, not hollow. Solid.

NP: I'm curious. [Laughs]

JI: Okay.

NP: So, now to the general questions that we ask, and that is one of them--. When you think about the work that you did for Saskatchewan Wheat Pool—you can even go back to our earlier days of shovelling out the cars—do you see how you contributed to Canada's success as a grain trader? I'm assuming that you agree with me that it is a success as a grain trader.

JI: Well, Canada is, I would say, the best and the most dependable when it comes to clean grain and the grade of the grain wherever we shipped. What I contributed, I would like to say that probably, since I was in the maintenance department, we tried to do our best all the time and tried to put the right men on the job, the ones that they knew what had to be done. There were some people that--. We always had one good man on the cleaner deck that really looked after the maintenance because there was the everyday wear out—a chain break or something like that—so it had to be done. But when the season was over and navigation closed, and we had to overhaul a machine, we always designated two or three guys to that man, and he was sort of a lead hand, and he'd done the job, and we were satisfied with it. Yes. So other than that, I don't know. I was always a conscientious fellow.

NP: And so were those lead hands, I imagine.

JI: Oh, the lead hands were good people, and you could depend on them. There were some other ones that you had to have somebody to guide them and every once in a while tell them, "Okay, let's get going now." [Laughs]

NP: Given your experience within the system, if we look at it the other way that if you didn't do your job as well as you did—and those other people didn't do their jobs as well as they did—how would that impact on Canada's competitiveness and reputation?

JI: The reputation? I don't know. I think there was always an incentive, and I think I have to give credit to the government guys, the grain inspectors, because they were the ones who really kept us in line. Not that they really had to keep us in line, but they were the ones that set the bar, and we went by that. We'd done our daily job, and we made sure that we had good equipment and good working ethics. That was all.

[1:20:23]

NP: So the quality was there, but also, especially in your case, you contributed to the efficiency of the operation which made it a more economically viable--.

JI: I would like to think that I did contribute something. I mentioned before when I was a foreman that one of the crucial things that these huge elevating legs, rubber legs with steel buckets on them, and sometimes they did break or wore out, and we had to take them down and put new ones up. When it came to splicing, joining the two ends together on the elevating belt, you know the belt itself, and then once that was done, then you put the buckets on. But once that was so crucial to make sure that it was perfectly done, and when you tried it out it didn't touch any of the sides of the steel casing because if it--. It happened when I wasn't there or something and they had to do, and it was banging, and we had to stop it and correct it. So I always made--. When it was done, the joining it was done, I was there. Most of the time, I'd done it myself. But a lot of time they do it, but I was watching. [Laughing] So, yes. I like to think that I contributed a little bit.

NP: Yeah. Our hope—it's fading, but it's still flickering—is to set up a national historic site here to recognize the contribution of Thunder Bay to the development of Canada through the grain industry. So if we were able to accomplish that, what is it about the cleaning aspect of elevator operations do you think would be important to feature in--?

JI: What cleaning aspect? Cleaning is probably, I would say, one of the most important features of handling the grain through the grain elevators because if it wasn't clean, you could not ship the proper grade, then everybody would be losing starting from the farmers. They would not get the proper wages for the proper grades that they shipped in. So I think the cleaning, anyway, is a very

important part. Of course, the shipping and then the organizing and how the whole system is worked, it's, yeah, I think we've done quite well in Thunder Bay for many, many years.

NP: So if you imagine someone coming in, like I did to this interview, with very little knowledge of the cleaning system, coming into an interpretive centre, what would you see as the easiest, best way of demonstrating the importance of cleaning?

JI: Well, when it comes to demonstrating, I can visualize to see not the whole cylinder--. The indent cylinder is very basic. That has to be shown. Even if one shows a section of it with the parts in it, you don't have to have all the other parts that hold it in place. But the cylinder, the trough inside, the conveying system, so how it gets discharged, and it goes down to the other ones, the aspirator, and probably how it works and what it does, right? That's the very first step, the aspirator and the cylinder. Then perhaps underneath a couple of screw conveying system to collect the discharge product. If you want to go a step further, perhaps we could show that part of the grain was cleaned on a screen-type machine because the screens are the most efficient to remove the seeds from the grain—the broken grain, the seeds, and very small particles.

[1:25:19]

NP: Mmhmm. Would it be possible to build a mini system?

JI: Too costly.

NP: Too costly.

JI: Too costly. If I would mention the cylinders, inside how it worked, the aspirator on the top, screw conveying system, perhaps a little bucket elevator to lift the grain to the top and goes through the garner and the scales and so on, yeah, I think if you approach some of the elevators, they might do a little bit of little parts of it here and there. I think so.

NP: Yeah. Well. Now, are there any questions that I haven't asked you that you were just dying to answer? [Laughing]

JI: No, I think we covered quite a few things. Not every little thing, but we covered quite a bit. Maybe when you interview somebody else, maybe somebody else will give you a little more information and things like that.

NP: Well, I don't think they'll probably be able to add much to the way the grain is cleaned, unless there's been a massive change in how it's done! [Laughing]

JI: I don't know.

NP: So thank you so much. Now the one thing I will talk to you about after I sign off here is you have a lot of material, and if we were to put together a little piece for our website, which is more likely to happen than our physical site, it would be good to be able to have some of the diagrams and photographs that you have to go along with that you've said. So let's talk about that. But thank you very much. It's been very enjoyable spending this time with you.

JI: Thank you. I enjoyed it myself.

End of interview.